



**WEST SUSSEX GROWERS ASSOCIATION  
VIABILITY OF THE HORTICULTURAL GLASSHOUSE INDUSTRY  
IN WEST SUSSEX:  
PROSPECTS FOR THE FUTURE AND LIKELY SCALE OF DEVELOPMENT  
OVER THE NEXT 10 TO 15 YEARS**

**REPORT BY  
READING AGRICULTURAL CONSULTANTS LTD,  
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HENNOCK INDUSTRIES LTD**

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## Principal Findings

The historical aspect of the industry and its dynamism have made it a significant part of the local economy, employing over 1,300 full-time staff as well as thousands of part-time workers. It has a production-only turnover of about £120 million, and supports a large service industry. Marketing trends and currency issues all indicate a healthy capacity for long-term expansion. It is perhaps true to call the West Sussex glasshouse industry the 'Cinderella' of the local economy, whose contribution has been under-played for many years possibly due to it having 'always been there'.

The trends to more corporate businesses and larger sites are inexorable for many reasons, and will place greater demands on the planning system. Despite a lack of available land and concerns about labour cost and availability, there is still a desire and demand for expansion within the area. Labour demands are mostly for skilled and managerial staff, and the trend to more highly skilled and qualified staff is likely to accelerate.

Energy issues, especially price volatility, have been a major concern recently but also offer a significant opportunity for the industry to be host to highly efficient renewable energy and energy-from-waste schemes. The all-year-round demand for heat from glasshouse production, which all highly efficient energy schemes demand, is almost unique within the area. There are likely to be planning issues resulting from this.

It is likely that there will be significant demands from the industry (particularly within the edibles sector) for larger areas of new glass, mostly above 10 hectares, and with associated packhouses and energy centres. There will also continue to be demand from smaller 'family-owned' business to replace or extend existing glasshouse units, although some smaller areas of glass (of less than 2 hectares) may become uneconomic and potentially present opportunities for redevelopment. Finally, there is also the real prospect that the area may be host to one or more major glasshouse hub developments.

## **Executive summary**

### ***UK horticulture***

The glasshouse area in England has fallen steadily over the last fifteen years, by about 270 hectares, with the largest fall occurring in the South East.

All specialist glasshouse areas have seen a reduction in the area of glass, although West Sussex has seen the smallest loss in both absolute and relative terms and now contains the largest area of glass of all the specialist areas.

The greatest losses have occurred with the smallest glasshouse holdings, with the glasshouse area on larger glasshouse holdings remaining steady or increasing over the last fifteen years.

The overall area of protected cropping has declined steadily over the last fifteen years, with most of the decline within the protected salad and vegetable sector. There have been small increases in the area of protected fruit (especially strawberry) and ornamental cropping.

The value of UK-produced tomatoes, peppers and other vegetable crops has increased over the last fifteen years, whilst the value of home-produced lettuce and cucumbers has fallen throughout this period.

The quantity of imports of vegetable crops outweighs home production to a significant extent. Nevertheless, this increase in imports has supplied increasing consumer demand.

Older, less efficient, glasshouses growing salad and vegetable crops are going out of production and are being replaced by modern units. The remaining older glasshouses tend to be associated with small, family-run businesses, often with a limited lifespan and commonly producing containerised ornamental plants.

The impetus for the development of larger businesses and, within them, larger glasshouses, has been due to a number of factors but in particular:

- economies of scale in initial construction costs;
- efficiency gains, especially in labour and energy use;
- production gains from better glasshouse and equipment design;
- the growth of multiple retailers, who now account for around 80% of UK fresh produce sales and deal only with the minimum number of large suppliers.

UK producers do have some advantages over importers, particularly in relation to the latter's labour relations, pest and disease control, water supply, nutritional values of the produce and rising input costs.

The UK industry is generally regarded as extremely efficient, particularly when compared to lower input production centres in North Africa or the Iberian peninsular. The high value of the British currency against that of overseas suppliers, especially in the Euro zone, favoured imports to the UK in the period to 2007 but this has been reversed since then with the GBP currently at an all time low against the €. This will make UK production more competitive compared with imports but will also increase the cost of imported raw materials. UK growers may also not benefit as much as anticipated from falling energy prices because of the latter's link with the US\$.

Horticulture represents 14% of total agricultural output by value in the UK at over £2 billion. DEFRA estimate that the farm-gate value of protected cropping is £505 million, although the results from the survey conducted in this study show this to be a considerable underestimate. The average annual Management and Investment Income (per hectare of glass) for the sample of specialist glasshouse holdings in the Reading University survey has been about £26,000 for the non-edibles sector and £12,000 for the edibles sector over the last fifteen years. Average annual rates of return on capital have been 10% and 8% from the non-edible and edible sectors respectively.

The glasshouse holdings in the Reading University sample have therefore performed reasonably well financially, with sufficient return to allow for expansion and/or modernisation. Although the survey conducted in this study did not ask for detailed financial records, it is apparent from the turnover figures received that the glasshouse industry in West Sussex is of a considerably larger scale than that represented by the Reading University survey. As the local industry benefits from factors such as economies of scale in production and marketing, and consolidation of support services, it would be expected to outperform the sample of glasshouse holdings in the Reading University survey.

### ***Background to the West Sussex industry***

Horticulture and protected cropping have been a significant part of the West Sussex economy and culture for many generations. The industry is represented throughout the area but there are particular concentrations south of the A27 in the Chichester, Littlehampton and Worthing areas and nearer to Portsmouth. The former Land Settlement Association has moulded the structure of the industry over the years.

The cropping history of the industry shows a dynamism and willingness to embrace change, and the industry has been at the forefront of adopting technical developments in structures and production systems.

There are considerable natural advantages to the location, especially light levels and mean temperatures which have particular advantages during the winter months and allow earlier cropping using less energy than other parts of the UK. The local industry has also developed a significant infrastructure of support and marketing services, including packhouses which form an integral part of production units, and which now provide all-year-round supply. There are some disadvantages to the location of the industry, particularly with regard to the cost of labour and energy.

The structure of the industry is changing from family-owned to corporate businesses, and with increasing overseas connections (both UK companies owning overseas sites and overseas companies buying UK ones). The more corporate nature of the industry is likely to promote a greater demand for larger sites.

### ***WSGA membership survey***

The survey of WSGA members covered 162 hectares of glass. As this is 97% of DEFRA's figure for the glasshouse area in West Sussex, it must place considerable doubt on the accuracy of DEFRA's census data.

Responses to the survey were received from seven producers of mainly edible crops and 27 producers of mainly ornamental crops.

The survey showed that the value of production from these producers is £98 million, of which over half is from the seven producers of mainly edible crops. This figure represents the value of production only from the West Sussex nurseries surveyed and does not include the value of produce imported from companies' other sites (either in the UK or abroad) or the value of other marketing activities (such as retail garden centres). It does also not include the contribution of producers growing intensive outdoor horticultural crops on the coastal plain. For these reasons, the figure is likely to be a significant underestimate of the economic contribution of the glasshouse industry, and certainly the total horticultural industry, to the West Sussex economy.

The survey indicates that the glasshouse sector employs a total of nearly 1,300 workers (full-time equivalents). There is some uncertainty about the definitions used and understood by respondents. Other studies of employment carried out for Chichester District Council suggest the horticultural sector (presumably used in its widest sense to embrace all production, marketing and support services) employs 2,600 full-time workers in the District which suggests that the figures provided for this survey related mainly to production alone from nurseries, in common with the turnover figures provided.

There are plans for significant investment in glasshouse expansion, especially in Chichester District. Greater expansion is anticipated from growers of edible crops and these will be in

larger individual blocks of glasshouses. The land required is unlikely to be available on some existing sites.

Plans for expansion in Arun District are likely to be offset by the loss of current production area to housing development. Little or no expansion is anticipated in Horsham or Mid Sussex Districts.

The primary concerns affecting the future viability and development of the businesses surveyed were product prices, energy costs (particularly for producers of edible crops), labour costs and labour availability.

Planning issues and constraints are of more concern to producers of edible crops (given their plans for expansion and the requirement for large-scale sites); whilst pesticide availability is of more concern to producers of non-edible crops (given that Integrated Crop Management techniques have been developed as an alternative to pesticide use for edible crops).

### ***Planning policies***

There are no specific policies at a national, regional or county level for horticultural development, although all provide a supportive framework for agricultural (including horticultural) development.

Four Horticultural Development Areas (HDAs) were introduced in Chichester District in 1999 with the intention that new horticultural development should be directed to these areas. There are no areas designated for horticultural development in Arun District but new glasshouses should be grouped with existing structures and avoid intrusion into open landscapes.

The horticultural policies in both the Chichester and Arun Local Plans have been saved until the adoption of the Local Development Frameworks, which are currently in preparation and will run until 2026. It is likely that the principles of the current policies in both Districts will continue in the Core Strategy of the Local Development Frameworks. However, in Chichester District, in particular, the preparation of the Core Strategy may entail a review of the HDA boundaries, with the local planning authority eager to engage with the industry so that it is aware of opportunities and limitations in this review.

### ***Planning records***

There have been applications for about 130 hectares of new or replacement glasshouses and polytunnels in Chichester and Arun Districts over the last sixteen years, which represents an average annual demand of over 8 hectares. Nearly three-quarters of the area applied for has been in Chichester District.

Most applications in both Districts have been for the erection of new, rather than replacement, glasshouses and polytunnels, with the majority (101 hectares out of 113 hectares) for new glasshouses.

Growers in Chichester District have applied for relatively large areas of new and replacement glass; whilst those in Arun have been mostly for smaller extensions to existing glasshouses.

High proportions of the applications have been permitted by the District Councils (85% and 93% in Chichester and Arun respectively), although the proportion permitted decreases as the size of the application area increases; consequently the area of new glass that has been permitted over the last sixteen years amounts to about 55 hectares, slightly over half the area applied for.

Only five appeals have been lodged against the refusal of applications for glasshouse developments in the two Districts in the last twenty years, with no appeals lodged since 2000.

### ***Planning issues***

Transport is a key issue for both planners and growers, both in terms of efficiency and ease, and noise and reduction in amenity values. High population density means that noise can be an issue in production, but records of complaints indicate this can usually be resolved.

### ***Marketing trends***

Organic, Fairtrade, superfruit and 'Buy local' are all brands / issues which have had a positive impact over recent years. Consumption of fresh fruit and vegetables has had year-on-year increases in the UK for a considerable period, and the WSGA members contribute to providing both local and national supplies. The trend for encouraging local production/buy local is likely to be a net benefit to the WSGA members.

### ***Support***

Producer Organisations are a significant economic factor to the industry in the area. There is considerably more direct and indirect support for foreign growers than UK ones, who are thereby disadvantaged.

### ***Energy***

Energy remains a key component of the industry, and price volatility is a key issue. The long-term energy picture for the UK nationally is a worrying one in terms of price stability and security of supply, and government inaction and bad policy will take many years to overcome.

There are some infrastructure issues within the WSGA area, with insufficient capacity or network.

By preference the industry would use Natural Gas. The industry is ideally suited to host highly efficient distributed energy projects, although there are relatively few of these within the WSGA area compared to nationally. It is also suited to host renewable energy schemes but there will be additional planning considerations for these particularly in respect of haulage.

The significance of carbon tax and carbon credits has diminished and is likely to remain low for the foreseeable future.

### ***Labour***

Growers' responses within this study show that labour cost is the most important concern regarding inputs, equal with energy. Nationally, labour costs account for about 40% of total input costs in the glasshouse industry.

Third most important is labour availability. There is a shortage of skilled workers in the horticultural industry at all levels due to its labour-intensive and seasonal nature and perceived low rates of pay.

There has been significant investment in automation and mechanisation in many sites, both for edible and non-edible crop production. The cost of this equipment combined with its complexity means that there are considerable calls on highly skilled labour and greater demand for staff at supervisory and managerial levels which are now in short supply. Automation and lower labour input systems also require much larger glasshouses than were common previously.

The large number of small businesses which were characteristic of the industry in the area some years ago were much more reliant on family labour. This allowed more flexibility in available hours and expenditure, especially in difficult times, but did not encourage succession.

Over time, local seasonal and casual workers have been more difficult to find. As a result, the horticultural industry has turned increasingly to source workers from abroad, particularly eastern Europe, especially through schemes such as SAWS. This labour pool has become increasingly involved in more managerial roles. The industry is however still a significant local employer, despite the use of migrant workers.

Accommodation is and will continue to be a major headache for employers of large numbers of seasonal workers and local planning authorities. Many sites have invested in mobile homes/caravans, with some higher level staff provided with houses on site. Growers of long-season crops tend to have fewer problems recruiting staff because they can offer a longer period of regular employment, a higher annual salary and better working conditions.

### ***Labour trends***

The fall in value of the UK currency against the Euro and linked currencies in eastern Europe will cause a fall in income for those staff remitting earnings to their families in eastern European countries. Expanding economies in those countries following EU membership may also induce workers to return there. It is likely that local employment within the industry will increase over the foreseeable future due also to increased local availability and expansion.

### ***Land***

The horticultural industry is a highly capital-intensive form of land-based production, which has become more capitalised over the years. In the highly competitive industry, the need for economies of scale dominates. Lack of availability and planning constraints have led to a high cost for suitable and available land in the area which, when combined with financial and other incentives, particularly abroad, have pushed several growers to develop and invest outside the WSGA area.

The cost of land has historically been a relatively small proportion of the overall costs of developing a new glasshouse unit. However the price of land suitable for glasshouse development with planning consent has risen sharply in the south of England, as supplies have dwindled. There is a wide range paid, but typical prices would normally be at £40,000 - £100,000 per hectare if sold within the horticultural sector. Arable land that could be used for field tunnels, or conceivably for glasshouses after a planning application, may be bought for £30,000 - 50,000 per hectare. There are high values for land held for hope value but, by definition, this land will not be available to develop for horticultural production.

### ***Structures and costs***

Modern glasshouse structures are much larger than their predecessors but have a longer lifespan (around 25 years in good condition) and are considerably more energy-efficient. A typical glasshouse holding of more than 2 hectares for edibles production would cost around £550,000 per hectare to establish; whilst a similar area for young plant production would cost over £1.14m per hectare.

The cost of plastic clad multi-span tunnels, of the higher end variety on a large scale, is around £225,000 per hectare including internal fittings, whilst the cost of field cover (Spanish Tunnels) is around £55,000 per hectare for a 2 hectare plus area.

### ***Capital sources***

Sources of capital are primarily banks and the sale of assets (land), with some limited support from government.

### ***Dereliction issues***

Glasshouse design is continuously evolving, and this leads to a limited economic lifespan of the houses. Older houses can be used for other lower value crops. Very old houses (typically more than 35 years old) tend to become uneconomic for any cropping. Historically greenhouses tended to be demolished and replaced, often by integrating with other smaller blocks into a larger area. 'Orphan' blocks where this is not possible due to a lack of additional area pose the greatest risk for dereliction.

At present dereliction is not a serious issue in the WSGA area and tends to be associated with small sites, especially former LSA ones. In planning terms the issues of dereliction concern unsightliness, reduction in amenity values and potential dangers to other residents. These are currently insignificant within the WSGA area.

The costs of cleaning up derelict glasshouse sites are typically £25,000 per hectare for the structures, plus £10,000 per hectare for other works if the site is reverting to bare agricultural land or being developed for housing. As sites become larger the potential for larger dereliction issues may arise.

## **1. Introduction**

- 1.1 This report has been commissioned by the West Sussex Growers' Association (WSGA) and prepared by Reading Agricultural Consultants Ltd (RAC), Gerry Hayman Horticultural Consultancy and Hennock Industries Ltd.
- 1.2 The WSGA is a specialist horticultural branch of the National Farmers' Union, with the membership comprised of those around the West Sussex area who have a strong interest in horticulture. The primary activities of the WSGA are public relations, education and training.
- 1.3 The purpose of the study is to provide guidance and assistance to WSGA in its discussions with the local planning authorities and other statutory bodies. The funding partners are the South-East England Development Agency (SEEDA), West Sussex County Council, Arun District Council and Chichester District Council.
- 1.4 The brief lists the issues to be considered in meeting these objectives which have been grouped into the following nine subject matters, to form the basic structure for this report. These are:
- the structure, size and nature of the glasshouse industry (chapter 2);
  - financial aspects of the glasshouse industry (chapter 3);
  - the West Sussex glasshouse industry (chapter 4);
  - the survey of WSGA members (chapter 5);
  - planning issues (chapter 6);
  - production and marketing issues (chapter 7);
  - energy and environmental issues (chapter 8);
  - labour issues (chapter 9);
  - capital investment issues (chapter 10); and
  - dereliction issues (chapter 11).
- 1.5 Key points arising from the chapters are set out at the beginning of each chapter.
- 1.6 The approach to the study has been to describe the glasshouse industry nationally with reference to published data, particularly those available from DEFRA statistics and the Horticultural Business Survey conducted by Reading University. The study then describes the glasshouse industry in West Sussex in detail with particular reference to a survey of WSGA members carried out by the authors. An analysis of all planning applications for glasshouse developments in the last 15 years in Arun and Chichester Districts has been undertaken, and

discussions have been held with officers of the two District Councils. The report then considers the main issues facing the industry, which are set out at Chapters 7 to 11.

1.7 The draft final report was circulated to the Executive of the WSGA in January 2009, and a meeting held in early February with the Executive to discuss comments arising. A presentation of the report was made to the Association's AGM on 23 February 2009.

1.8 This report was written by:

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## **2. Structure, Size and Nature of the Glasshouse Industry**

### **Key Points**

- *The glasshouse area in England has fallen steadily over the last fifteen years, by about 270 hectares, with the largest fall occurring in the South East*
- *All specialist glasshouse areas have seen a reduction in the area of glass, although West Sussex has seen the smallest loss in both absolute and relative terms and now contains the largest area of glass of all the specialist areas*
- *The greatest losses have occurred with the smallest glasshouse holdings, with the glasshouse area on larger glasshouse holdings remaining steady or increasing over the last fifteen years*
- *The overall area of protected cropping has declined steadily over the last fifteen years, with most of the decline within the protected salad and vegetable sector. There have been small increases in the area of protected fruit (especially strawberry) and ornamental cropping*
- *The value of UK-produced tomatoes, peppers and other vegetable crops has increased significantly over the last fifteen years, whilst the value of home-produced lettuce and cucumbers has fallen throughout this period.*
- *The quantity of imports of vegetable crops outweighs home production to a significant extent (up to 20:1 for lettuce). Nevertheless, except in the case of cucumbers, the increase in imports has supplied increasing consumer demand*
- *Older, less efficient, glasshouses growing salad and vegetable crops are going out of production and are being replaced by modern units. The remaining older glasshouses tend to be associated with small, family-run businesses, often with a limited lifespan and commonly producing containerised ornamental plants.*
- *The impetus for the development of larger businesses and, within them, larger glasshouses, has been due to a number of factors but in particular:*
  - *Economies of scale in initial construction costs*
  - *Efficiency gains, especially in labour and energy use*
  - *Production gains from better glasshouse and equipment design*
  - *The growth of multiple retailers, who now account for around 80% of UK fresh produce sales and will deal only with the minimum number of large suppliers*

- *UK producers do have some advantages over importers, particularly in relation to the latter's labour relations, pest and disease control, water supply, nutritional values of the produce and rising input costs*
- *The UK industry is generally regarded as extremely efficient, particularly when compared to lower input production centres in North Africa or the Iberian peninsular*
- *The high value of the British currency against that of overseas suppliers, especially in the Euro zone, favoured imports to the UK in the period to 2007 but this has been reversed since then with the GBP currently at an all time low against the €. This will make UK production more competitive compared with imports but will also push up the cost of imported raw materials. UK growers may also not benefit as much as anticipated from falling energy prices because of their link with the US\$.*

## **Introduction**

- 2.1 In this chapter, the glasshouse industry is examined nationally and regionally, the latter in order to compare the relative importance of the glasshouse sector of the horticultural industry in specific regions in England. This is relevant to any variation in planning policy in different areas of the country and also to examine any regional trends that have a specific bearing on the West Sussex area. Where possible, such trends that may be apparent are explored but this is sometimes made difficult by the changes that occasionally take place in the compilation of statistics by DEFRA. For example, one of its major publications, 'Basic Horticultural Statistics for the United Kingdom', presents data that include Northern Ireland and Scotland, whereas the June Census data previously published data as 'England and Wales' but following devolution now publishes data as England only.
- 2.2 It should also be noted that DEFRA statistics refer to "area under glass or plastic structures". For the sake of simplicity, these are referred to throughout this report as 'glasshouses'. (The term 'greenhouse' may often be used to describe both glass-clad structures and a polythene-clad tunnel (referred to as polytunnels)). The term 'glasshouse holding' may also be used, referring to a holding on which glasshouses and/or polytunnels create a major part of the income. Throughout this report 'glasshouse area' refers to the area of the glasshouses or polytunnels on a holding and not to the overall size of the holding.

### ***The Glasshouse Industry in England***

2.3 Table 2.1 below shows the glasshouse area by region in England.

**Table 2.1: Glasshouse areas by region in England (hectares)**

<b>Region</b>	<b>1993</b>	<b>1997</b>	<b>2002</b>	<b>2007</b>	<b>Change (ha) 93-07</b>	<b>% change 93-07</b>
North East	17	18	23	20	+3	+18
North West	273	269	251	227	-46	-17
Yorkshire and the Humber	296	298	248	240	-56	-19
East Midlands	208	198	177	173	-35	-17
West Midlands	180	179	159	195	+15	+8
Eastern	443	414	387	411	-32	-7
South East (inc. London)	535	562	475	403	-132	-25
South West	196	224	216	207	+11	+6
<b>England</b>	<b>2,146</b>	<b>2,161</b>	<b>1,936</b>	<b>1,875</b>	<b>-271</b>	<b>-13</b>

Any irregularity in England total is as a result of rounding  
 Source: DEFRA June Census.

2.4 There has been a overall decline in the glasshouse area in the country of about 270 hectares in the last fifteen years, with all the major regions of production (the North West, Yorkshire and Humberside, South East and Eastern) exhibiting a fall in area. This decline, both nationally and within the major regions, has been fairly steady over this period.

2.5 The South East has shown the largest fall in area in both absolute and relative terms and is now no longer the main region of glasshouse production in the country. The loss of 132 hectares of glass over the last fifteen years represents nearly half the overall loss in England during this period. However, this loss will soon be compensated by a major glasshouse project on the Isle of Thanet which is under construction. The authors are aware of another potential large glasshouse development in Kent and also, of particular significance, one being planned in West Sussex.

2.6 There have been increases in the glasshouse area in some regions of England (the North East, West Midlands and the South West) but these are small (of up to 15 hectares) and not significant.

2.7 This fall in area is also exhibited within particular areas of concentration of glasshouses in the country; what might loosely be called 'specialist glasshouse areas'. The total in Table 2.2 represents 49% of the total glasshouse area in England as of June 2007. All these major glasshouse areas have shown a decline in area over the last fifteen years, with the largest falls in absolute terms being in Lancashire, Hampshire and the Isle of Wight (with Table 2.3 below showing that most of this loss has been in Hampshire), Humberside and Lincolnshire. In

relative terms, the fall in area has been particularly marked in Hampshire/Isle of Wight and in Hertfordshire.

**Table 2.2: Area of glass by the major glasshouse areas in England (hectares)**

	1993	1997	2002	2007	Change 93-07 (ha)	Change 93-07 (%)
Essex	178	177	168	153	-25	-14
Hertfordshire	57	48	42	34	-23	-40
Humberside	197	200	164	157	-40	-20
Lancashire	182	170	157	135	-47	-26
Kent	109	112	97	87	-22	-20
Hampshire & Isle of Wight	96	107	-	54	-42	-44
West Sussex	188	200	189	167	-21	-11
Lincolnshire	162	149	124	126	-36	-22

Source: DEFRA June Census.

2.8 In comparison with the other major glasshouse regions, West Sussex has shown the smallest loss of glasshouse area, in both absolute and relative terms. Of all the specialist regions, it now contains the highest area of glass.

2.9 The glasshouse area within the South East is indicated in Table 2.3 below.

**Table 2.3: Glasshouse area by county in South East England**

	1993	1997	2002	2007	Change (ha) 93-07	% change 93-07
Berkshire	11	13	8	8	-3	-27
Buckinghamshire	12	15	12	11	-1	-8
Oxfordshire	10	8	8	10	-	-
East Sussex	27	29	16	13	-14	-52
West Sussex	188	200	189	167	-21	-11
Surrey	49	50	37	31	-18	-37
Hampshire	78	85	- <sup>1</sup>	43	-35	-45
Isle Of Wight	18	22	- <sup>1</sup>	11	-7	-39
Kent	109	112	97	88	-21	-19
Greater London	30	22	15	18	-12	-40
<b>South East Region<sup>2</sup></b>	<b>535</b>	<b>562</b>	<b>460</b>	<b>403</b>	<b>-132</b>	<b>-25</b>

<sup>1</sup>2002 data suppressed by DEFRA to protect individual holdings

<sup>2</sup>South East figure not sum of counties

Source: DEFRA June Census.

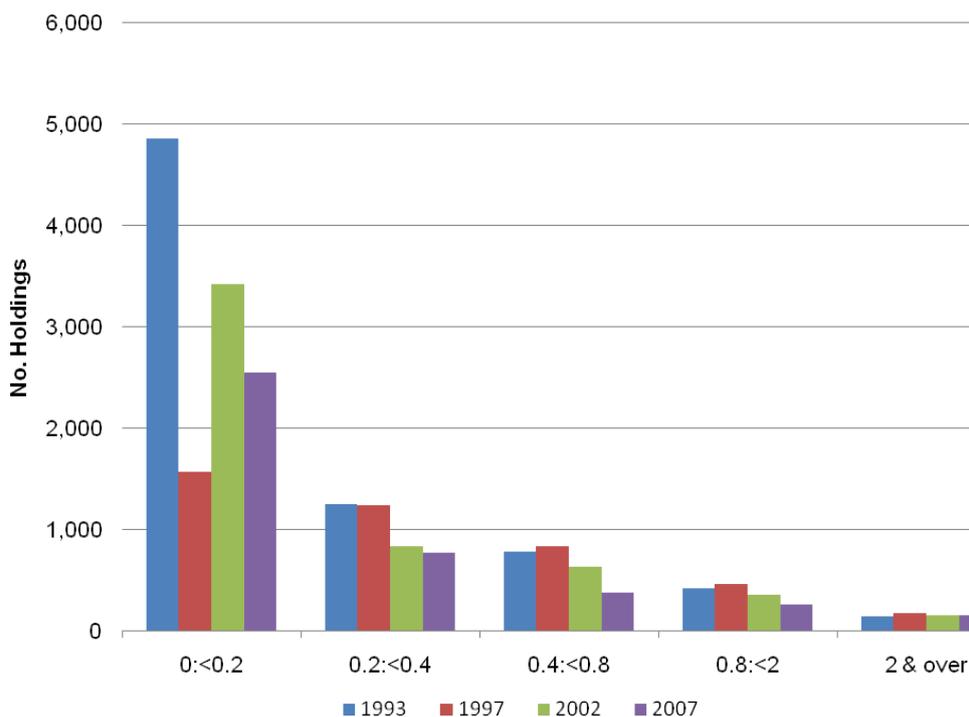
- 2.10 West Sussex contains the greatest concentration of glass in the South East, accounting for about 35 - 40% of the glasshouse area in the region over the last fifteen years. The only other significant concentrations are in Kent and Hampshire and the Isle of Wight (taken together).
- 2.11 The substantial fall in glasshouse area identified above has occurred throughout the region, although there has been a particularly significant fall in Hampshire. The glasshouse area in West Sussex has fallen by 21 hectares which, whilst substantial in absolute terms, represents a fall of only 11% over the last fifteen years; one of the smallest declines in the region. The other counties with substantial areas of glass (Kent and Hampshire/Isle of Wight) have shown equivalent or greater absolute losses and considerably higher relative losses.
- 2.12 The fall in the glasshouse area does not necessarily reflect a general decline in overall output, or even profitability, of most individual businesses within the industry during this period. In some areas, where the fall in area has been marked, there has been a 'fall-out' of the weaker businesses that have failed to compete in a period of strong competition from imports and an increasing need to keep up with technology. Capital grant schemes that were available up to the early/mid 1990s but which have since been discontinued, such as the Agriculture and Horticulture Development Scheme, the Farm and Horticultural Development Scheme, the Horticultural Improvement Scheme and the Farm and Conservation Grant Scheme, did much to encourage the replacement of old glasshouses and the modernisation of equipment. Those businesses that failed to take advantage of the grants would have found themselves drifting further away from the leaders in the industry and finally less able to compete.
- 2.13 Thus, the fall in the glasshouse area is largely considered to be the result of the older glasshouses going out of production as they gradually become less competitive with modern glasshouse production. Those of this group that continue in production tend to be family-run businesses with low overheads but often with a limited lifespan of 10-15 years in terms of their future viability. Many have survived by becoming small nurseries growing bedding and pot plants and, where planning permission has been obtained, have extended the life of the business by becoming small garden centres. Such businesses do not require particularly modern glasshouses since, unlike crops such as tomatoes, cucumbers, lettuce and most cut flowers, they grow crops that do not require high light conditions, high energy inputs or exacting environmental controls. The local industry can therefore be seen as a success story nationally.

### ***Size Distribution of Glasshouse Holdings in England***

- 2.14 Figure 2.1 shows the distribution of glasshouse holdings in five different size groups. This shows a marked decrease in the last fifteen years in the number of the smallest glasshouse holdings, with the rate of decline decreasing as the groups become larger. This is part of a

continuing trend as it becomes uneconomic for many small glasshouse businesses to operate by growing more 'traditional' crops such as salad crops and cut flowers, especially when the crops concerned are those commonly marketed either direct or through Producer Organisations (POs) to multiple retailers. These require volume and continuity of supply that the smaller grower, working independently, cannot provide. Only POs marketing edible crops are recognised and eligible for EU grant aid.

**Figure 2.1: Distribution of glasshouse area by size groups (England)**



Source: DEFRA June Census

***Cropping: trends in areas of major crops in the UK***

2.15 The areas of the major glasshouse crops grown in selected years over the last fifteen years are shown in Table 2.4.

**Table 2.4: Summary of area of protected cropping in the UK (hectares)**

	1993	1997	2002	2007	Change 93-07 (ha)	Change 93-07 (%)
Vegetables	2,330	1,418	1,055	668	-1,662	-71
Fruit <sup>1</sup>	39	45	108	146	+107	+374
Ornamentals	822	1,028	994	1,065	+243	+130
<b>Total</b>	<b>3,191</b>	<b>2,491</b>	<b>2,157</b>	<b>1,879</b>	<b>-1,312</b>	<b>-41</b>

<sup>1</sup> Predominantly strawberries, but also includes raspberries and blackberries

Source: DEFRA, Basic Horticultural Statistics for the United Kingdom, 1993-2007

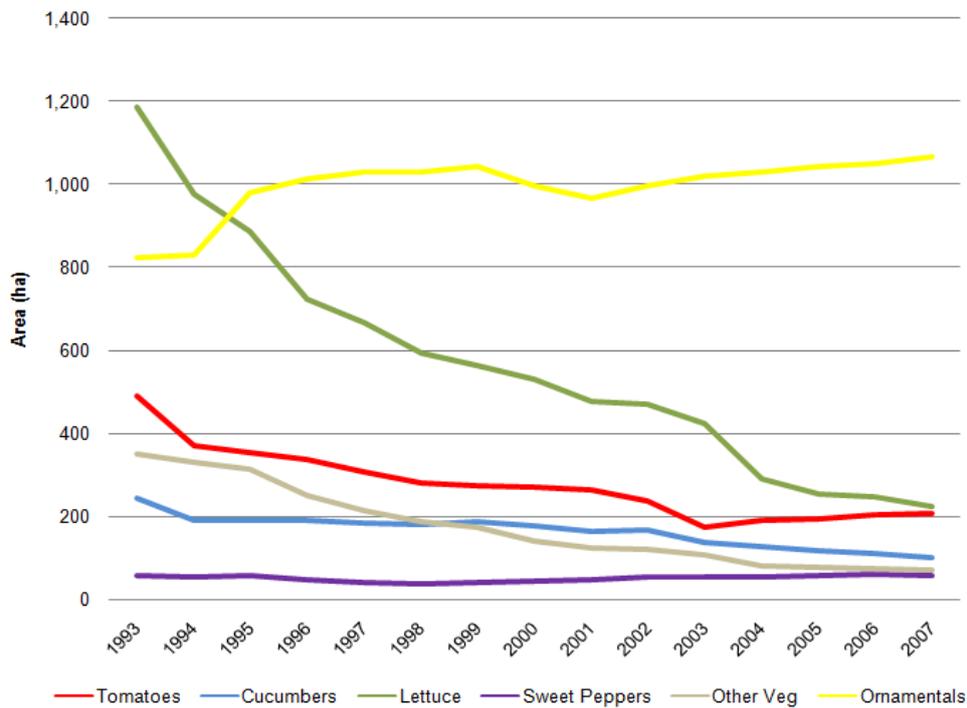
2.16 The overall area of protected cropping in the UK has declined steadily over the last fifteen years, and is now only 60% of the area occupied in the early 1990s. The vast majority of this

fall in cropped area is accounted for by a significant reduction (70%) in the area of protected vegetable cropping. Indeed, in absolute terms, there have been small increases in the area of protected fruit and ornamental cropping.

- 2.17 The interpretation of industry statistics needs to be conducted with considerable care. Clarity is needed in references to numbers of holdings, numbers of businesses (some may occupy multiple sites), area of production, volume and value of production, and volume and value of consumption.
- 2.18 Taking tomatoes as an example, the UK production area fell by more than half and the number of individual growers by more than 90% between 1980 and 2000. This was the result of aggressive competition from imports, especially EU subsidised southern European production, and structural changes in the retail food sector. Total UK production volume was maintained at around 120,000 tonnes over this period however, as those producers remaining in business more than doubled their yields. The improvements were due to a number of factors:
- the cessation of production of late-planted, low-yielding, unheated crops;
  - new glasshouse designs with better light transmission, producing significant yield increases as a result. These glasshouses also provide better working conditions for staff;
  - larger individual companies who have been able to benefit considerably from economies of scale. This relates to the capital costs of glasshouse structures and equipment, packhouses and packing equipment, and general requisites and supplies;
  - larger individual glasshouses offer major improvements in energy and labour efficiency. Energy efficiency is improved because they have a lower ratio of glass surface to floor area and therefore a reduced heat loss, than a number of smaller glasshouses occupying the same area. New glasshouse designs also have better sealed glazing systems and the ability to accommodate energy conservation systems such as thermal screens;
  - the availability of natural gas for heating and the generation of carbon dioxide for enrichment of the glasshouse atmosphere, which has given considerable increases in production;
  - the development and improvement of computers for optimisation of the glasshouse environment, for both better crop growth and the control of pests and diseases;
  - improved pest and disease control technology such as the use of resistant varieties and the continuing development of biological control, using natural enemies of pests to replace pesticides.

- 2.19 These changes are well demonstrated in West Sussex where the Land Settlement Association at Sidlesham had some 125 tenants in the early 1980s, all of whom grew tomatoes, usually late crops in rotation with winter lettuce. Currently only one commercial tomato producer is still in production in this area.
- 2.20 Over the past 10 years the UK tomato industry has radically changed its product mix to differentiate this from imports of cheaper commodity types of fruit. In 2008 less than 20% of the production area was dedicated to producing classic salad tomatoes i.e. round, red and eight to the pound. The remainder of the area is now used for growing higher value products such as cherry and cocktail size varieties, fresh plum types and some beefsteak varieties, many of these being sold on the vine.
- 2.21 Most of these speciality tomatoes produce lower marketed yields but at higher prices. Total UK production volume has decreased therefore, to around 18% of national annual consumption, according to Defra statistics. The value of UK production is estimated at 30% of annual consumption however, i.e. £150 million out of £500 million at retail level.
- 2.22 Figure 2.2 illustrates the trends in area of the main protected vegetable crops. The largest decline has been in the area of glasshouse lettuce, which has been reduced by 81% over the last fifteen years. However, it should be noted that many lettuce growers will crop successively in the same area within the cropping year. The area recorded in the Census is cropped area so that a loss of one hectare of glasshouse will be registered as a loss of anything between 3 and 6 hectares of lettuce. This tends to create severe swings in recorded area. Even so, the area of lettuce has declined significantly, if not so severely as portrayed in Figure 2.2. The reduction in area is largely due to the quantity of imports that has increased from 83,400 tonnes in 1993 to over 154,800 tonnes in 2007. Unlike crops such as tomatoes (but see above) and cucumbers, yield per hectare of lettuce remains more or less static from conventional production systems because of the nature of the plant (its mass cannot practically increase per hectare and there is a finite amount that can be planted per hectare). However, hydroponic production systems, with one project currently in development in West Sussex, would allow faster crop production and more crops per annum.
- 2.23 Unlike tomatoes, diversification with glasshouse cucumbers is clearly limited. Here, the area cropped has decreased by 60% between 1993 and 2007 and, whilst total yield per hectare has increased by 12% over this period, the total marketed yield decreased by over 50%.
- 2.24 The area of sweet peppers has remained fairly constant over the last fifteen years at about 60 hectares, although the late 1990s saw a slight decline in area. The last nine or ten years have seen small annual increases in area to meet increased demand, although this has been met primarily by sharply increased imports.

**Figure 2.2: Glasshouse vegetables - UK area**



Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 1993 – 2007

2.25 Table 2.5 below shows the changes that have taken place in the area of cut flowers between 1993 and 2005 (the latest year for which comparable data are available).

**Table 2.5: Major ornamental crops under glass and plastic in the UK**

	1993	1997	2002	2005	% change 93-05
<b>Cut flowers</b>	Hectares				
Carnations	30	12	5	7	-78
Alstroemeria	21	25	19	16	-25
Chrysanthemums AYR*	61	38	18	13	-79
Other chrysanthemums	95	69	30	19	-80
Other cut flowers	89	78	55	50	-44
<b>Total cut flowers</b>	<b>297</b>	<b>221</b>	<b>127</b>	<b>104</b>	<b>-65</b>
<b>Spring/summer bedding</b>	Millions				
Bedding plants (boxes, trays and packs)	27.9	25.9	24.8	24.2	-13
Bedding plants in pots	75.7	94.9	96.3	105.0	+39
Tubs, hanging baskets	6.6	22.9	25.6	33.3	+502
<b>Total area under glass (hectares)</b>	<b>822</b>	<b>1,028</b>	<b>994</b>	<b>1,043</b>	<b>+27</b>

\* AYR: all-year-round.

Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 2004 & 2006

2.26 The dramatic fall in the area of cut flowers can be explained mostly by a combination of two factors: an increase in imports (for example, imports of chrysanthemums increased from £32m in 1993 to £98m in 2005) and a general decline in popularity. On the other hand some cut flowers, such as roses, lilies and tulips, have gained significantly in popularity but most supplies have been imported, from East Africa in the case of roses, or Holland and the eastern area of England in the case of bulb flowers. The total value of UK production of cut flowers fell from £40m in 1993 to under £16m in 2005.

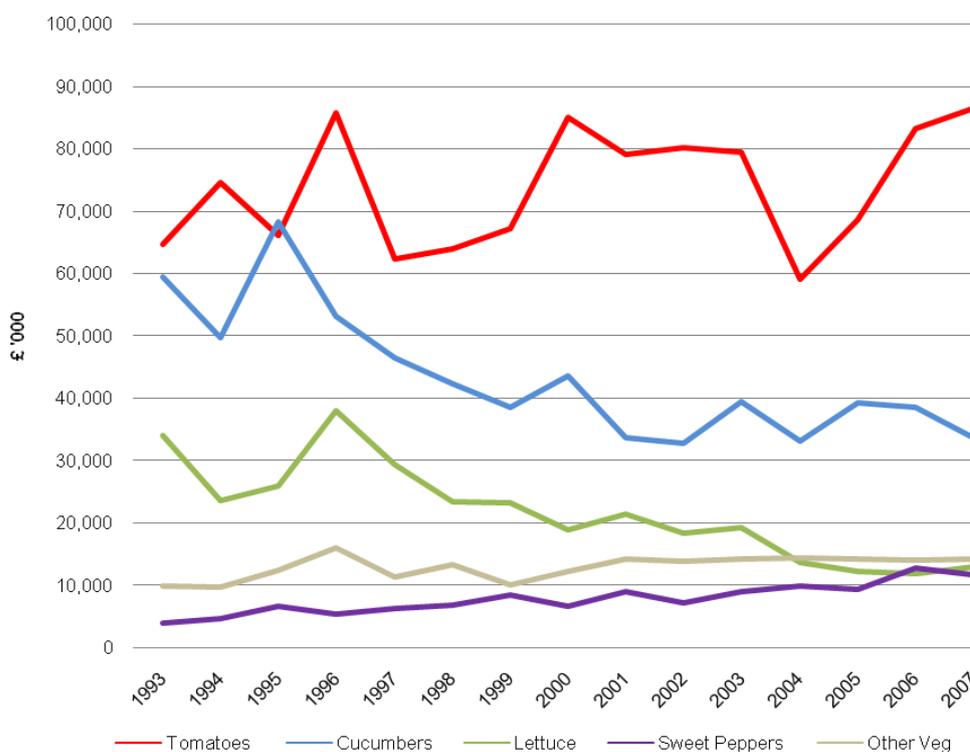
2.27 By contrast, and as suggested by the increase in area illustrated above, the value of bedding plant production has increased from under £100m in 1993 to £154m in 2005.

2.28 Originally, much of the glasshouse area occupied by the ornamental sector would have been growing glasshouse vegetables.

***Cropping: trends in value of home production marketed in the UK***

2.29 Tomatoes have maintained their position as the major glasshouse vegetable crop in terms of value, with the value of home production increasing by 34% in current terms over the last fifteen years. The value of home-produced peppers has tripled from under £4m a year in the early 1990s to nearly £12m in 2007. 'Other vegetables', which include a wide range of crops such as herbs, aubergines, courgettes, chilli peppers, early cabbage and vegetable plants for growing on, have increased steadily by over 40% over this period.

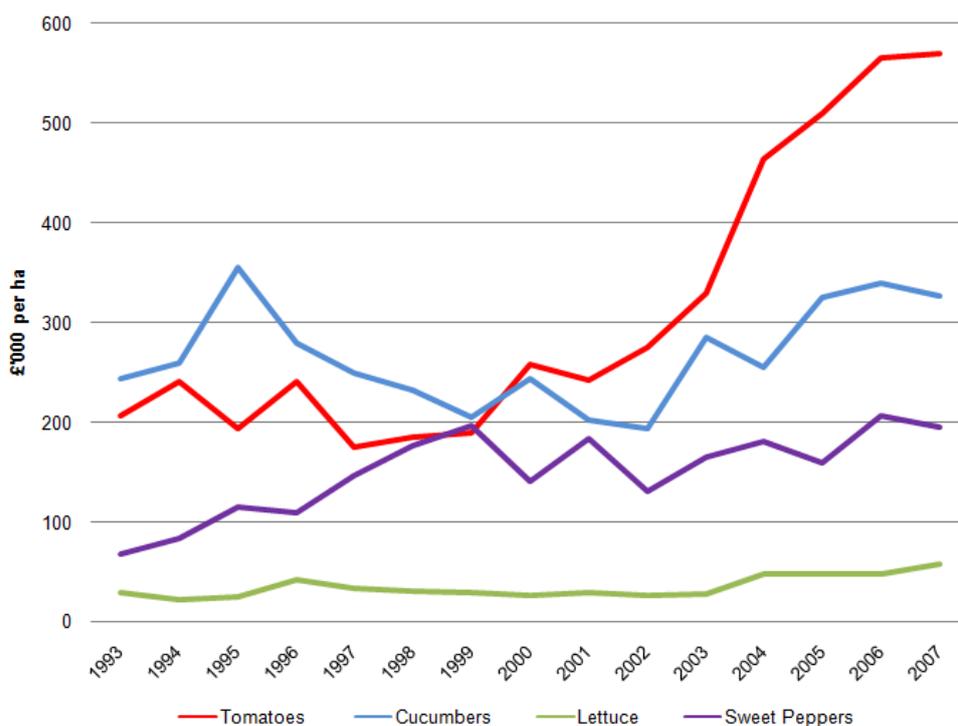
**Figure 2.3: Value of Glasshouse Vegetable Crops in the UK**



Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 1993– 2007

- 2.30 The value of protected ornamental crops increased slowly between 1995 and 2005 from about £257 million to £277 million.
- 2.31 The glasshouse lettuce crop has fallen in value by 62% in current terms over the last fifteen years. This is in part a result of the development of new leafy salad products, such as baby leaf types and salad mixtures in new packs, much of which are grown abroad or outdoors in the UK in summer. In addition to UK production, there are substantial imports of these products through the winter, traditionally the glasshouse lettuce season, with imports having risen from 83,000 tonnes per annum in 1993 to 155,000 tonnes in 2007.
- 2.32 The fall in the value of the cucumber crop of over 40% is largely due to the declining area cropped. However, in common with all crops, the value per planted hectare has increased in the last five years with increased prices and yields, as shown in Table 2.4 below.

**Figure 2.4: Average farmgate value in the UK - £ per planted hectare**

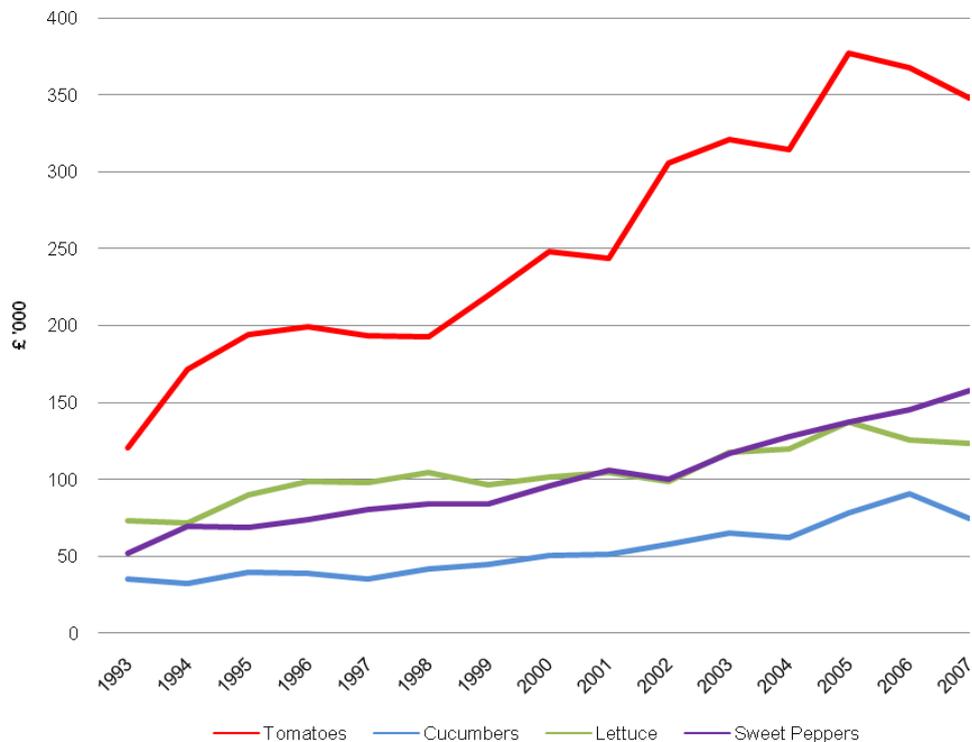


\*Data for protected ornamentals unavailable  
 Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 1993 – 2007

- 2.33 The value of tomatoes indicated in this graph should be interpreted with caution. Whilst it does indicate an increased price achieved from the development of the speciality tomato products mentioned above, the average is affected by the loss of lower value, late planted crops. It should not be assumed that there has been any significant price increase for any particular product over this period.
- 2.34 Figure 2.5 shows the value of imports of the four crops of major importance in UK production, all of which have increased at a rapid rate in the last fifteen years. However, it should also be

noted that imports were atypically low in the base year (1993), possible as a result of the fall in value of sterling after the UK's exit from the European Monetary Union in 1992.

**Figure 2.5: Value of imports of vegetable crops to the UK**

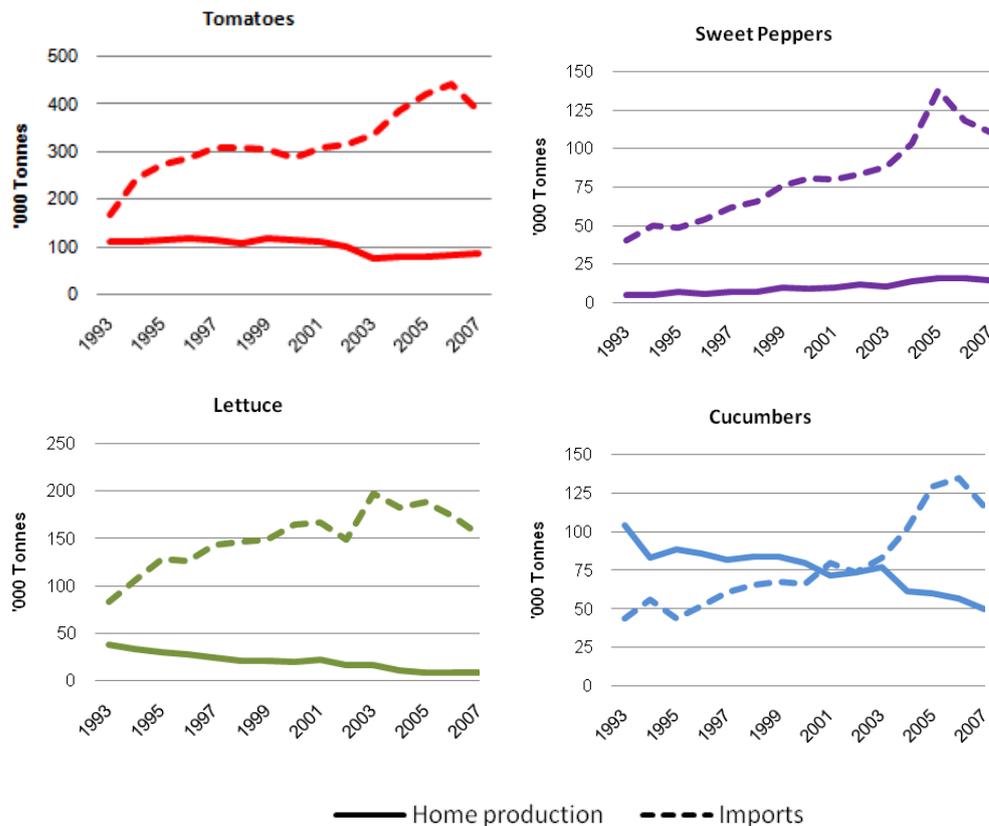


\*Data for protected ornamentals unavailable  
 Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 1993 – 2007

- 2.35 Figure 2.6 compares the volume of home production in the UK with imports of the four major vegetable glasshouse crops.
- 2.36 In all cases, the quantity of imports outweighs home production to a significant extent (from over 2:1 for cucumbers to nearly 20:1 for lettuce). A large proportion of the imports come from Spain and Portugal, and in many cases from farms owned by UK producers or rented from local farmers. Morocco is starting to become a significant producer, with many Spanish companies having operations there, and several UK producers investigating the potential. Morocco has tariff-free treaty arrangements for exporting fruit and vegetables to the EU, with quotas for many items such as tomatoes (although not organic ones). Spanish producers in particular are currently complaining to the European Commission about an increase of imports from Morocco, sold in consignment, i.e. without price, and the need for a reform of the entry price scheme.
- 2.37 The increase in the quantity of imports has been in response to increased consumer demand, with a significant increase in the total supply (imports plus home production) available on the UK market. The exception is cucumbers where total supply has been relatively static, with home production having declined at a rate mirrored closely by the increase in imports. This

trend looks set to continue, with a likely fall-out of the weaker businesses, leaving only the larger and more modern glasshouse units remaining.

**Figure 2.6: Comparison of UK production and imports**



Source: DEFRA, Basic Horticultural Statistics for the United Kingdom 1993 – 2007  
 \*Data for protected ornamentals unavailable

### **Competition Issues**

- 2.38 Increased competition from imports, as previously mentioned, has had a major effect on the glasshouse salads sector in the past fifteen years. This followed accession to the EU by Spain and by association (though not formally a member) the Canary Islands. A number of factors are relevant to this situation and are explained below.
- 2.39 Traditionally, imports from mainland Spain were concentrated in the autumn and from the Canary Islands in the spring. With improvements in technology in Spain, better transport arrangements and the introduction of long shelf-life tomato varieties, which are better able to withstand lengthy journeys, the Spanish and Canary export seasons have been extended to the majority of the year. The strength of sterling in recent years, especially after the introduction of the Euro in those countries, also favoured imports.
- 2.40 The introduction of Category Management by the major British retailers, with responsibility for year-round supplies placed with a very small number of primary suppliers, has encouraged the sourcing of non-UK season supplies by British-based companies. This has led to the

establishment of their own production in Spain and Portugal by British producers. This has included cucumbers, tomatoes, sweet peppers, Iceberg lettuce, baby-leaf salads, herbs and watercress. Most of the glasshouse crop development has been in the Almeria and Murcia areas of Spain but, more recently, production units are being established in Extremadura. Additionally there has also been considerable inward investment in new technology and expertise in Spain from Holland.

2.41 On the other hand, there are also problems for Spanish producers, including:

- increasing labour costs from an initial low base. Many North African workers are employed, especially in the Almeria area and evidence suggests that this has frequently been on an illegal basis. Immigrant workers have enjoyed neither the pay nor social support enjoyed by Spanish workers and even culminated in incidents of civil unrest;
- severe pest and disease pressures caused by the overuse of pesticides, many of which are no longer effective, and low technology, which makes reliable and effective biological control difficult. The current EU review of pesticides will result in the loss of many active ingredients and, assuming harmonisation of pesticide approvals in the EU, will disadvantage Spanish producers, especially with the background of growing consumer antipathy towards pesticide use on foods;
- there is current severe pressure on water supplies in Spain and the Canaries due to competition between agriculture and tourism for water. The news has featured stories of water being tankered by sea into some parts of Spain. There has also been considerable investment in desalination plants on the coast in Spain, which is very energy-demanding and should be taken into account in comparing the carbon footprints of product trucked from Spain with that grown in heated glasshouses in the UK;
- evidence suggests that long shelf-life varieties of tomatoes have lower nutritional values (in their antioxidant content, for example) than fresh UK produced ones. This is of significance in relation to the growing awareness of the implications of diet for health, especially for children and the important role of fruit and vegetables in this area;
- currently, Spanish growers are being adversely affected by cheap imports from non-EU countries such as Morocco. Both land prices and transport costs are also increasing and tomato and cucumber growers have recently experienced a considerable fall in income.

2.42 Thus, UK producers do have some advantages over imported produce, although a realisation of these advantages will depend on an ability to differentiate their products from imported ones in the minds of consumers in supermarkets. Much of the aggressive competition between

supermarkets is price-orientated, especially in those products now regarded as commodities, rather than the premium products for which British glasshouse salad crops used to be regarded.

- 2.43 The current economic downturn is also leading retailers to promote 'value' lines to try to maintain their market share. This is placing increasing pressure on suppliers and is the subject of considerable current consumer and media interest, especially where this also has health, ethical and animal welfare implications.
- 2.44 Economic difficulties also appear to be leading Government generally, and Defra specifically, to amend their attitude to the importance and value of UK production and food security issues. These are assuming a higher priority relative to the environmental agenda and issues which have dominated Defra policies in recent years.
- 2.45 The glasshouse salads sector in the Netherlands has also suffered similar competition from southern growers, particularly from Spain, but the Dutch sector has been better placed than the UK to withstand such competition because:
- the sector is larger and more developed than in the UK;
  - Netherlands is in the Euro zone and therefore not subject to exchange rate and price fluctuations;
  - the sector is not dependent on supplying a single home market (as is the case in the UK) but sells into a number and variety of national markets;
  - the Dutch government has designated areas appropriate for glasshouse development and growers have relocated to these area from traditional ones, such as those close to Den Hague or Zoetermeer, where urban development has led to increased land values and provided a financial stimulus to relocation;
  - the Dutch banking system, particularly the major role played by the Rabobank, has been much more proactive and supportive of glasshouse development there. There are reports however that the way in which these developments have been capitalised to secure tax advantages and some of the leaseback arrangements being operated, are distorting business and equity valuations. It is believed that these financial arrangements are the subject of official investigation. (Rabobank is reported to be the largest 'owner' of glasshouses in Holland with over 600 hectares);
  - because of the operation of the energy market in Holland and the ownership of CHP generating facilities by growers, they have been able to be more flexible in operating these plants and to optimise electricity sales as a result.

### 3. Financial Aspects of the Glasshouse Industry

#### **Key points**

- *Horticulture represents 14% of total agricultural output by value in the UK*
- *The total farm gate value of home-produced protected edible and non-edible crops is estimated to be £505 million per annum within a total value for horticulture of over £2 billion*
- *Management and Investment Income (M. & I. I.) for the sample of specialist glasshouse holdings has varied considerably over the last fifteen years*
- *Profitability has been higher and more consistent in the sample from the non-edibles sector than from the edibles sector, as reflected in average M. & I. I. per hectare of about £26,000 for the non-edibles sample and £12,000 for the edibles sample*
- *The sample from the non-edibles sector has also generated a higher rate of return on capital in the last fifteen years, with an average return of 10%*
- *The sample from the edibles sector nevertheless produced an average rate of return of 8% over the period, which included three years of no return*
- *The glasshouse holdings in the sample have therefore performed reasonably well financially, with sufficient return to allow for expansion and/or modernisation*
- *It is apparent from the survey conducted for this study that the glasshouse industry in West Sussex is of a considerably larger scale than that represented by the Reading University survey. As the local industry benefits from factors such as economies of scale in production and marketing, and consolidation of support services, it would be expected to outperform the sample of glasshouse holdings in the Reading University survey*

#### **Introduction**

- 3.1 The annual University of Reading publication, 'Horticulture Production in England, Horticultural Business Data', is the best available source of financial data for businesses of this type available.
- 3.2 Nationally, the report indicates that horticulture's share of total agricultural output has increased by 4% over the last forty five years, and in 2006 was 14.3% of total agricultural output in the UK. In monetary terms, the latest figures for home-produced horticultural crops estimated a total value of £2,107 million, of which approximately one quarter (£505 million) is from protected edible and non-edible crops.

- 3.3 The financial data in the Farm Business Survey are collected from just over 200 horticultural holdings, approximately 2% of the total number of horticultural holdings in England in 2006. However, about half of the total holdings are regarded as too small (with a Standard Labour Requirement of less than 0.5 worker) to be representative for inclusion in the Farm Business Survey. The survey therefore restricts itself to sampling from a total population of about 4,700 horticultural holdings which include specialist fruit farms, outdoor horticultural holdings, specialist hardy nursery stock and specialist glasshouse holdings.
- 3.4 A sample of 89 specialist glass holdings were sampled for the 2006 survey, which represents about 8% of the 'eligible' total number of glasshouse holdings in the country. The Specialist Glass group includes heated and cold glass and polytunnels, and several large-scale soft fruit producers who use polytunnels for production.
- 3.5 Results for the specialist glasshouse holdings are sub-divided into 'mainly edible crops' and 'mainly non-edible crops'. The former comprises mainly tomato holdings and amounts to 31 holdings; the latter to mainly flowers and nursery stock (58 holdings).
- 3.6 Some of the terms used in Tables 3.1 and 3.2 below require some definition. Management and Investment Income (M. & I. I.) is a measure of profitability after deducting the notional value of the unpaid manual labour for the grower and his or her family. It is a measure of the amount available to reward them for managerial work and capital investment.
- 3.7 Return on Capital is M. & I. I. as a percentage of the average of opening and closing valuation of growing crops, tillages (cost of fertiliser and cultivations), stores, glasshouse equipment and machinery. A typical minimum rate to allow for a business to expand and/or modernise in the longer term (i.e. outside the current exceptional economic circumstances) is taken as being 5%.
- 3.8 Results for 1993, 1997, 2002 and 2006 in the sample of 'specialist glasshouse businesses - mainly edible crops' are shown in Table 3.1 below.

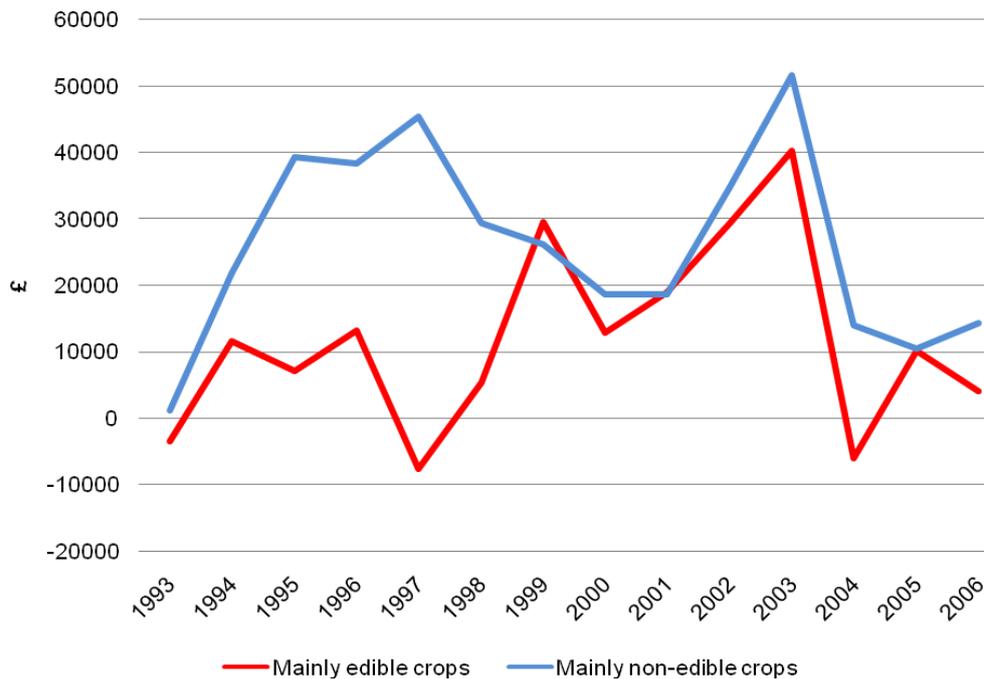
**Table 3.1: Financial performance of specialist glasshouse holdings in England: mainly edible crops (average £ per hectare)**

	1993	1997	2002	2006
Number of holdings	53	49	31	31
Average area of glass (ha)	1.33	1.19	3.87	1.94
	£/ha	£/ha	£/ha	£/ha
<b>Total Gross Output (a)</b>	<b>194,101</b>	<b>214,786</b>	<b>282,691</b>	<b>181,438</b>
Seeds, plants, marketing, feed	48,256	49,500	53,099	51,654
Labour cost (inc. allowance for unpaid family labour)	61,318	73,360	89,085	67,428
Glasshouse fuel	22,306	28,803	38,052	22,467
Power and machinery	19,721	14,938	15,708	17,158
Other costs, inc. overheads	45,964	55,817	57,430	18,668
<b>Total costs (b)</b>	<b>197,565</b>	<b>222,418</b>	<b>253,374</b>	<b>177,375</b>
<b>Management and Investment Income (a-b)</b>	<b>-3,464</b>	<b>-7,632</b>	<b>29,317</b>	<b>4,063</b>
<b>Return on Capital %</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>2</b>

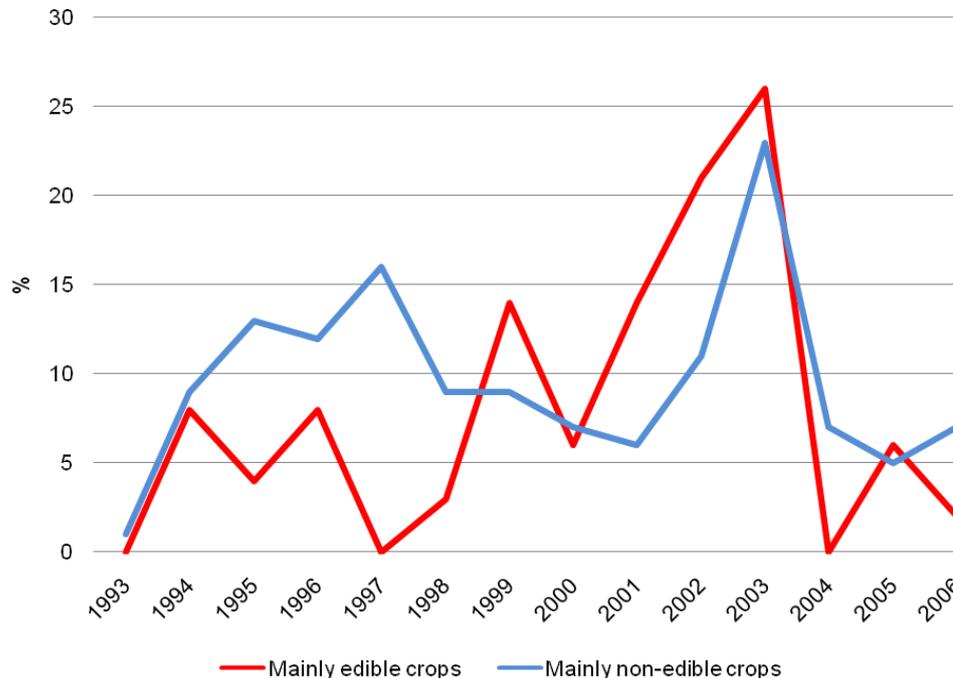
Source: "Horticultural Business Data" 1995, 1999, 2004, 2006/2007, University of Reading

- 3.9 The sample in this sector has seen a considerable degree of variability in its results in the last fifteen years, with negative M. & I. I.s in the selected years in the 1990s, through to successful results in 2002, with a return on capital of over 20%, to more modest returns in the last year.
- 3.10 In the light of this variability, Figures 3.1 and 3.2 illustrate the M. & I. I. and return on capital for both the edible and non-edible sectors over the full fifteen years. Figure 3.1 shows the M. & I. I. was generally higher in the non-edibles sector, at an average of about £26,000 per hectare and was always positive throughout the period.
- 3.11 The sample from the edibles sector exhibited greater variability over this period, with negative M. & I. I. in three years (1993, 1997 and 2004). It also returned a lower average M. & I. I. of just under £12,000 per hectare throughout the period.

**Figure 3.1: Management and investment income per hectare - specialist glass businesses**



**Figure 3.2: Return on capital - specialist glass businesses**



Source: "Horticultural Business Data. 2007", University of Reading

3.12 The sample from the non-edibles sector has also provided a generally higher return on capital during this period, with an average rate of return of nearly 10%, compared to a average return of 8% from the sample from the edibles sector (three of the years in question did not, however, provide any return to the sample in the edibles sector).

3.13 Out of 31 holdings in the edibles sample, the vast majority (25) made a profit in terms of M. & I. I, ranging from less than £12,000 to over £100,000. Six holdings made a loss, with two incurring substantial losses of over £50,000. The extremely wide range of profitability within a sector reflects many factors, among them being the financial soundness of the business (e.g. ratio of assets to liabilities), production facilities available and level of technical, marketing and managerial skills.

3.14 Table 3.2 shows similar results for the non-edibles sample:

**Table 3.2: Financial performance of specialist glasshouse holdings in England: mainly non-edible crops (average £ per hectare)**

	1993	1997	2002	2006
Number of holdings	28	44	58	58
Average area of glass (ha)	0.94	0.91	1.29	0.57
	£/ha	£/ha	£/ha	£/ha
<b>Total Gross Output (a)</b>	<b>301,876</b>	<b>474,256</b>	<b>490,871</b>	<b>498,728</b>
Seeds, plants, marketing, feed	89,240	120,173	139,106	183,702
Labour cost (inc. allowance for unpaid family labour)	110,293	158,686	181,223	177,533
Glasshouse fuel	13,269	14,236	13,747	19,062
Power and machinery	22,057	35,527	28,558	55,391
Other costs, inc. overheads	65,777	100,255	93,370	48,708
<b>Total costs (b)</b>	<b>300,636</b>	<b>428,877</b>	<b>456,004</b>	<b>484,396</b>
<b>Management and Investment Income (a-b)</b>	<b>1,240</b>	<b>45,379</b>	<b>34,867</b>	<b>14,333</b>
<b>Return on Capital %</b>	<b>1</b>	<b>16</b>	<b>11</b>	<b>7</b>

Source: "Horticultural Business Data" 1995, 1999, 2004, 2006/2007, University of Reading

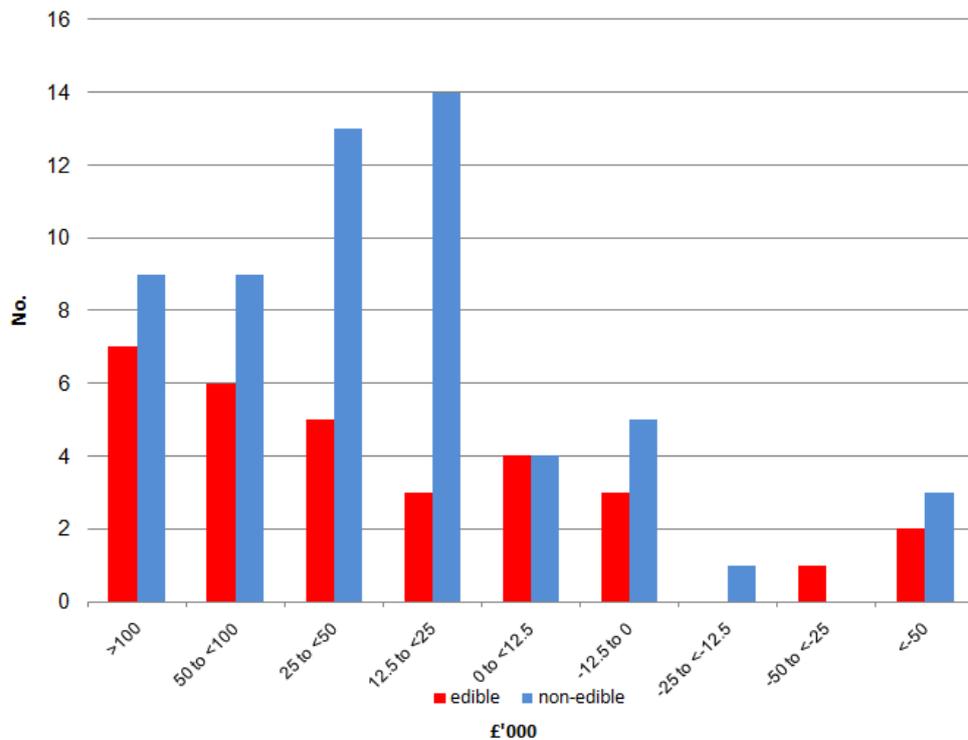
3.15 On the basis of the selected years, the sample of glasshouse holdings in the non-edibles sector has performed more consistently and more profitably than those in the sample of the edibles sector. As illustrated above also in Figure 3.1, the levels of profitability and return on capital have been consistently higher throughout the last fifteen years.

3.16 Again, there is a wide distribution of profitability among the sampled holdings although there is a cluster of moderately profitable holdings (returning between £12,500 and £50,000) that accounts for nearly half of the sample. Similar to the edibles sample, the vast majority (49) made a profit in terms of M. & I. I, with 15% of the sample returning over £100,000. Nine holdings made a loss, with three incurring substantial losses of over £50,000.

3.17 An important caveat when using data of this kind is that the presentation of average data will inevitably be made up of a range of results, in terms of both costs and output. Unfortunately, unlike other sectors, the sample of glasshouse holdings is too small for the results to show

premium against average results but, nevertheless, the distribution of Farm Business Income among the 31 and 58 businesses in the edible and non-edible sectors respectively is wide, as demonstrated in Figure 3.3 below:

**Figure 3.3: Distribution of farm business income by specialist glasshouse holdings in England sample (2006)**



Source: "Horticultural Business Data. 2007", University of Reading

- 3.18 These data may be of limited application to the West Sussex industry as there would appear to be very significant differences in the physical and financial structure of the industry there, compared with the Reading University sample. A survey of WSGA members was conducted by questionnaire and interview as part of this project, with a full discussion of the results set out in Chapter 5. Although detailed financial results were not requested, glasshouse area within the company and annual turnover figures were obtained. It should be noted that the turnover figures relate to production value from the company's own UK site or sites and do not include imported product either from other UK producers or the company's or other overseas sites.
- 3.19 Total turnover from all respondents was £93 million; £52 million from seven companies producing edible crops and £41 million from 25 producing ornamentals (although three did not provide a turnover figure).
- 3.20 The range for edibles growers was £300,000 to £22 million with a mean of £7.4 million. The range for growers of ornamentals was £45,000 to £22 millions with a mean of £2.0 million.

- 3.21 Total 'glasshouse' area represented was 153.2 hectares with 83.5 hectares producing edibles crops and 69.7 hectares producing ornamentals. Average areas were 11.9 hectares and 3.0 hectares respectively. Of the 83.5 hectares producing edibles, about 95% (79.6 hectares) was under glasshouse and 3.9 hectares were in polytunnels. The ornamentals area was made up of 62.1 hectares of glasshouses and 7.6 hectares of polytunnels.
- 3.22 Of the area producing ornamentals, only 7.2 hectares are producing what might be considered traditional protected crops in this sector i.e. cut flowers. The remainder is producing containerised plants of various types i.e. bedding plants and hardy nursery stock (HONS), both of herbaceous and woody species. Some of this glass has been built new for the purpose, by Roundstone Nurseries for instance, but much was previously used for growing salad crops.
- 3.23 Of the relatively few fruit growers who are still members of WSGA, no replies were received from traditional fruit growers although one of the respondents is growing soft fruit under protection and indicated an intention to erect further polytunnels; the large-scale development of which has caused planning disputes in other parts of the country (see Chapter 7). It is known that some West Sussex producers who are not members of WSGA and come from more arable backgrounds, two being Langmead Farms Ltd and Barfoots for instance, have more extensive areas of polytunnels.

#### **4. The West Sussex Glasshouse Industry**

##### ***Key points***

- *Horticulture and protected cropping have been a significant part of the West Sussex economy and culture for many generations*
- *The industry is represented throughout the region but with significant concentrations in certain areas*
- *The former Land Settlement Association has moulded the structure of the industry significantly over the years*
- *The cropping history of the industry shows a dynamism and willingness to embrace change*
- *The industry has been at the forefront of adopting technical developments in structures and production systems*
- *There are significant natural advantages to the location, especially light levels*
- *There are some disadvantages to the location of the industry, particularly with regard to cost base*
- *The structure of the industry is changing from family-owned to corporate businesses, and with increasing overseas connections (both UK companies owning overseas sites and overseas companies buying UK ones)*
- *The more corporate nature including overseas investment is likely to promote a greater demand for larger sites*
- *Packhouses form an integral part of production units, and it is likely that further developments in on-farm processing will occur*

### **Industry structure**

- 4.1 The majority of the WSGA industry is located in a few concentrated areas, with most of it being south of the A27. It is concentrated in the Chichester, Littlehampton and Worthing areas and nearer to Portsmouth. The Worthing area saw most of the early glasshouse development in the county with Worthing tomatoes being particularly famous, but also with significant areas of cut flower crops, such as carnations and roses. The industry in the Littlehampton and Worthing area was boosted by the relocation there of glasshouse companies, from the Lea Valley in particular, in the 1950s and 1960s. This was to take advantage of the better light conditions on the south coast, especially in the winter, at a time when there was also significant development for housing and light industry in the Lea Valley.
- 4.2 In common with most horticultural industries this one can be divided into protected (greenhouse) and field-based production, with many growers operating in both sectors. The south coast around the Chichester area has some of the most intensive production in the UK, for both protected and field cropping. There are large areas of Grade 1 agricultural land, and this has been developed and cultivated as a specific horticultural production area for more than 100 years (Hall, J, 2001).
- 4.3 A significant part of the WSGA history was the Land Settlement Association (LSA) areas, and a succinct history is given below:
- "The Land Settlement Association was formed in 1934 to provide employment on the land for unemployed industrial workers from depressed areas. Posters and pamphlets were distributed through employment exchanges inviting men to apply. They were vetted for suitability to the rural life and given a medical examination. The men received agricultural training and each family was given 5 acres to cultivate plus livestock to rear. The small holdings were run as a co-operative, but many communities failed when men complained of the long hours, low pay and isolation of rural life. Recruitment to the scheme ceased at the outbreak of World War II. The settlements were dissolved and privatised in 1983." (TUC History).*
- 4.4 The two main LSA settlements in the WSGA area were Batchmere/ Almodington and Sidlesham, both of which remain strong horticultural areas.
- 4.5 Technological developments have led to certain crops dominating at certain periods in the past. At present the dominant field crops are iceberg lettuce, other lettuce types, other salad crops such as baby leaf products, spinach, courgettes, sweet corn and some celery. Young plants, lettuce, peppers, tomatoes and herbs dominate the protected crop sector. Previously there have been periods of intensive celery production under glass, which has disappeared almost completely. It is inevitable that cropping patterns will continue to change; for example,

one new greenhouse crop in the area is medicinal herbs, and it is likely that the significance of this will increase. Pot and fresh cut herbs are now an important crop. The use of temporary field cover, both with structural support and without, has extended the growing season, reduced weather-related losses and damage, and improved quality significantly.

#### ***Local support infrastructure***

- 4.6 There is a significant benefit for the industry from the local support services that exist, many of which are highly specialised. Some examples are listed below, covering certain key areas, though this list is not exhaustive. In addition to supporting the industry they contribute a significant input to the local economy.

##### *Structural and civil*

- Bridge Greenhouses
- Fordingbridge Engineering
- B & M Plant
- SAS
- Amtrac

##### *Technical services*

- Phase Installations Ltd
- Bridge Greenhouses Ltd
- Mitchell
- Hortisystems Ltd
- LvZ Automation
- Denton Automation Ltd
- Protechnic
- (additionally various individuals)

##### *Sundries, requisites and agrochemical suppliers*

- Fargo Ltd
- Monro Horticultural Sundries
- Becker Underwood

##### *Training and education*

- The principal horticultural further education (FE) provider in the region is Brinsbury College, a campus of Chichester College. In addition the region has access to Merrist Wood College at Guildford and The Royal Botanic Gardens at Kew.

- Provision of Horticultural and Land Based Degree Courses is catered for locally by Hadlow College in Kent and Reading University. The last also has a significant research base in plant and soil science and horticultural light, as well as an economics department with horticultural and agricultural skills.

#### *Haulage*

- M Allen
- Bleach of Lavant
- NV Transport
- Stuart Lyons (Haulage) Ltd

#### *Machinery*

- Chichester Tractors
- Allman Sprayers
- Goodrowes
- Olema Engineering

#### *Packaging supplies*

- Linpac

#### *Research and development*

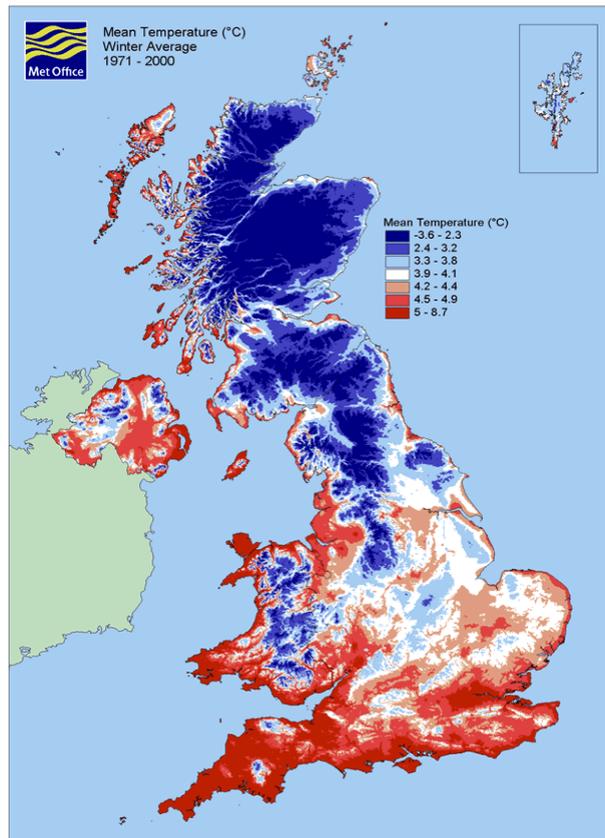
- Until recently the industry had the HRI facility at Efford, and prior to that also the Glasshouse Crops Research Institute at Littlehampton. The demise of the research base has been something the industry contested strongly, and there is still a clear commitment to research, mainly now through the Agricultural and Horticultural Development Board. Although privately owned, the Parigo site at Lagness has undertaken plant breeding on Alstroemeria over many years.

### **WSGA industry advantages**

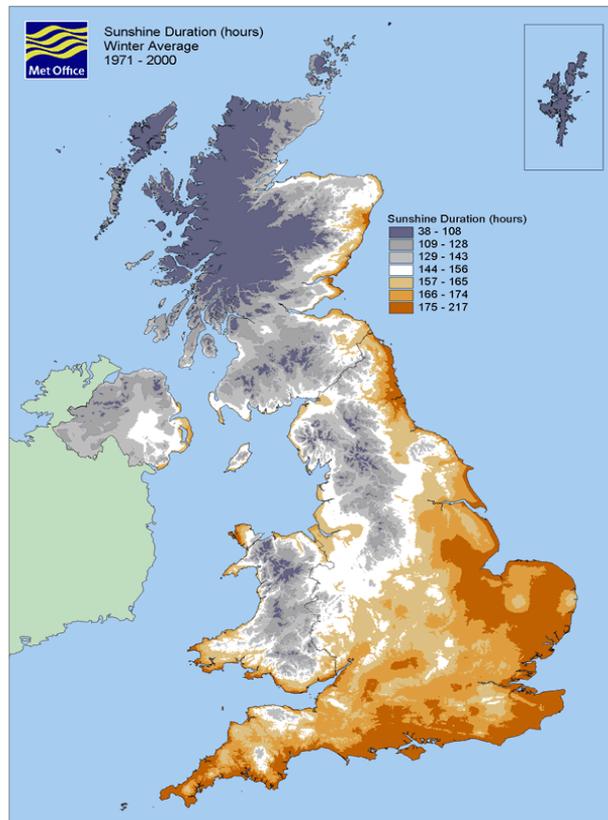
#### *Climate*

- 4.7 Light levels on the south coast are the highest in the UK, and significantly higher than the major concentrations of horticulture in the Midlands and North East, and somewhat higher than the Lea Valley. Mean temperatures are also higher, thereby allowing earlier cropping with less energy than similar operations in say Humberside. This is a natural and 'sustainable' benefit which is important both financially and environmentally. In particular this is true in the winter, when the light levels are lower and therefore most critical for plant growth, and heating costs are highest due to lower ambient temperatures.

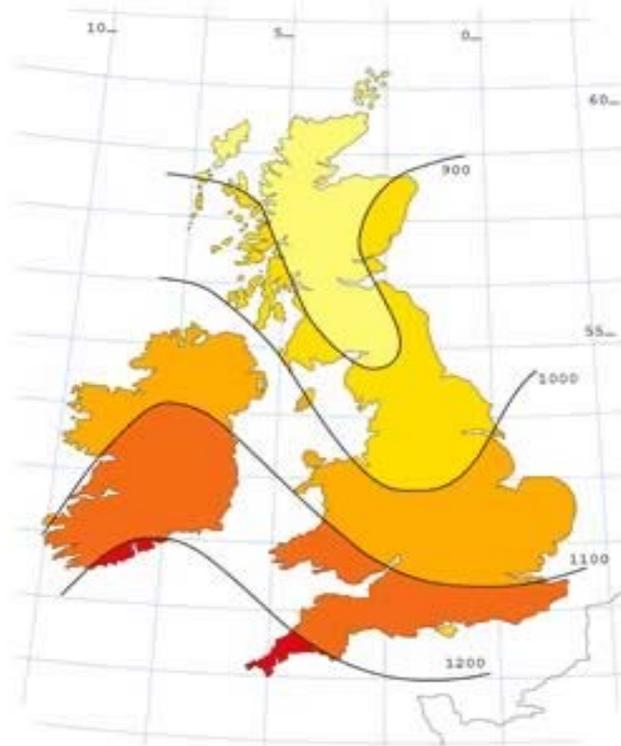
**Figure 4.1: Winter mean temperatures**



**Figure 4.2: Winter sunshine (hours)**



**Figure 4.3: Annual solar radiation**



*Infrastructure*

- 4.8 There is a substantial local infrastructure in terms of transport, energy and communications networks.

*Population*

- 4.9 The industry is within an area of high population density, and also close to significant markets in London and the South East generally. High population density provides a good local market and greater labour pool.

- 4.10 The proximity and ease of delivery to major distribution centres for the multiples is good, with the following supermarket depots being close to the region:

- Tesco - Southampton, Weybridge and Didcot;
- Sainsbury – Basingstoke and Waltham Point;
- Waitrose – Bracknell;
- Asda - Didcot, Dartford plus planned in Southampton

*Packing houses*

4.11 Although many growers have their own, smaller packhouses, Table 4.1 shows some of the larger units operating in the WSGA area:

**Table 4.1: Large packhouses within the WSGA area**

<b>Edibles</b>	<b>Non-edibles</b>
Natures Way Foods	Roundstone Nurseries
Wight Salads Group	Farplants Ltd
Humber VHB	Leythorne Ornamentals
Barfoots of Botley	Donaldsons Flowers
NV Produce Marketing	
Tangmere Airfield Nurseries	

***WSGA industry disadvantages***

*Costs*

Wages

4.12 The industry is located in an area with one of the highest prices for both residential and agricultural land. This impacts not only on purchase price but also in terms of wages for local workers and the cost of living generally. The differential for the South East excluding Greater London compared to national wages is around 13% more (Frontier Economics & Labour Force Survey). The financial pull of other industries reduces the availability of the labour pool for what is deemed less attractive (i.e. physically harder) work.

Cost of living

4.13 Although the South East is the wealthiest region, when the higher cost of living is taken into account then adjusted earnings drop to 76% (London = 100%) (Source SEEDA).

Materials

4.14 The main material that has significant additional costs is energy because of the distance from the main sources in the north of the UK. Electricity is typically around 10% more expensive than in the north-east, and gas can be up to 15% more, although normally is less than this.

*Energy limitations (see also Chapter 8)*

4.15 Within the area there are known problems with capacity in both natural gas and electricity, although this is not unique within the UK.

### *Water*

- 4.16 Apparent weather trends and increased demands may well lead to water supply issues in some areas, and there is more strain on the chalk aquifers that are the backbone of the supply. Southern Water is currently confident that its strategic plans to increase supply will be adequate.

### **Ownership**

- 4.17 Historically, horticultural businesses were family owned, although there has been a trend to more corporate structures. The majority of the larger businesses in the WSGA are now limited companies rather than family partnerships, and there are several substantial corporate ones, with multi-national links and holdings.
- 4.18 A secondary element of the structural changes is the establishment of strong links (contract growing or Producer Organisations (POs)) between growers. The largest employer of contract growers in the area is Roundstone Nurseries. There have been several overseas investors in the south coast area, notably the Portuguese RAR Group which now has controlling interest in the Wight Salads Group and also owns Vitacress (based in Hampshire but with multiple sites).
- 4.19 One new model for greenhouse development in the UK is the Thanet Earth project located in north-east Kent. This is the first in the UK that is similar to the Dutch one of having a serviced hub with greenhouses built around it. Thanet Earth is a 91-hectare site, with plans to build around 70 hectares of greenhouse and current construction on around 21 hectares.
- 4.20 The main investors are three Dutch companies: Rainbow, A & A, and Red Star. This is significant in two ways:
- it is a major shift of production out of the Netherlands and into the UK with Dutch organisation and investment; and
  - if the development were to be replicated in the WSGA area, it would require a similar large greenfield or brownfield site.
- 4.21 Although it is unlikely that there will be a substantial number of such sites constructed, there is currently one other serious proposal under investigation (also in Kent) but also one now in West Sussex. It should be noted that the scale of such projects gives them an element of critical mass, and were any of the major WSGA producers to construct new glass in one of these hubs then it is highly probable that this company may over time direct new investment and resources to such a location, and could move out of the WSGA area altogether if there is no similar development there.

- 4.22 The history of the Channel Islands tomato industry indicates that when the industry is constrained severely compared to other more favourable sites then it will eventually contract, and the momentum becomes irreversible as companies relocate and support services and qualified staff disappear.

### ***Cropping***

- 4.23 Major crops grown in the area are outlined below.

#### *Salad crops*

- Tomatoes
- Peppers
- Aubergines
- Lettuce and edible leafy crops
- Fresh cut and pot grown herbs
- Cress
- Medicinal herbs

#### *Pot plants*

- Chrysanthemum
- Begonia
- Poinsettia

#### *Cut flowers*

- Chrysanthemum
- Alstromeria
- Sweet peas

#### *Container plants*

#### *Bedding plants*

*Hardy ornamental nursery stock (HONS):* woody and herbaceous

*Shrubs* (including roses which used to be a significant local crop)

#### *Trees*

#### *Plant propagators*

- Iceberg and other lettuce types
- Baby leaf crops
- Salad crops (principally tomatoes)
- Brassicas

- Herbaceous and woody ornamentals
- Cut flowers

***Specialisation / vertical integration / agri-business***

4.24 The trend against vertical integration which took place in the 1980s has now been reversed, and there has been a more recent trend towards it again. A good example of this in the WSGA area is the RAR Group, which includes both primary production and food manufacture, as well as packaging manufacture. This trend has implications for land use, as there may well be opportunities for major developments which will not fit so readily into 'standard' land use categories.

***Structures***

*Protected cropping*

4.25 In common with the rest of Europe there has been a trend within the WSGA area towards larger structures, both in terms of footprint and height. For a period the Runcton area was home to both the largest single block of greenhouse in the UK and also to the largest plant propagator. There has also been a considerable increase in the area of temporary field crop protection, both direct groundcover and Spanish tunnels. It is likely that there will continue to be a blurring of the distinction between Spanish Tunnels (ST) and 'proper' multi-span plastic greenhouses, with the ST structures becoming more substantial and more sophisticated.

4.26 Typical greenhouse dimensions now would be:

- Salad crop: 10 hectares in area, with 6m gutter height;
- Propagation unit: 2 hectares in area, with 5.5m gutter height.

*Packhouses*

4.27 Packhouse structures have not altered significantly over the past 15 years, and remain steel portal-framed buildings with composite panels for cladding. Smaller packhouses are now less common, with some installations now being in excess of 1 hectare.

4.28 The role of the packhouse has generally now ceased from being merely to grade and pack produce from the site itself, to being one that will receive produce from both other sites belonging to the same group or company, and often also from entirely separate growers to maintain All Year Round (AYR) supply.

## 5. Survey of WSGA Members

### *Key points*

- *A survey of WSGA members was carried out by the authors to ascertain current and projected business activity and attitudes*
- *The value of the glasshouse sector in West Sussex is very considerable, around £150 million in total economic output per year*
- *The total value of all horticultural production in West Sussex, including outdoor crops, is of the order of £200 million per year. This could represent a retail value of around £500 million or over £8 per head of UK population per year*
- *The sector employs substantial numbers of staff, over 1,300 in direct production capacities but many more in support services and ancillary companies*
- *There are plans for significant investment in glasshouse expansion, especially in Chichester District but the figures identified in the survey are likely to be underestimates*
- *Greater areas of expansion are anticipated for edible crops and these will be in larger individual blocks of glasshouses. The land required is unlikely to be available on some existing sites*
- *Plans for expansion in Arun District are likely to be offset by the loss of current production areas to housing development but the industry will remain economically important in the area, especially if relocation of existing facilities is undertaken*
- *Little or no expansion is anticipated in Horsham or Mid Sussex Districts*
- *Companies surveyed have identified serious concerns affecting the future viability of their businesses and constraints to their development and expansion*

- 5.1 A survey of all WSGA members was conducted by letter or interview to gain information on the size and value of companies and the industry, cropping, intentions with regard to glasshouse expansion and attitudes to issues such as business confidence, key cost issues, environmental attitudes and factors constraining business operation or development.
- 5.2 Of the 48 active members of the Association, responses were secured from 36 or 75%. One of the respondents had retired and another is not involved in direct production. Some information was also obtained from non-WSGA members in the area, though not used in the analyses unless specifically referred to.
- 5.3 Seven responses were from producers of primarily edible crops and 27 from those growing ornamentals, of which two produce cut flowers and 25 produce containerised plants of various types (bedding plants, herbaceous perennials and HONS).
- 5.4 The total value of production recorded was £98 million; £52 million from edibles and £46 million from ornamentals. Average company turnover was £3.3 million; £7.4 million from edibles and £2.0 million from ornamentals.
- 5.5 It should be noted that these figures represent the value of production from the site, not total business activity. One salad producer, for instance, has a production value from the site of £11 million but a total turnover, including imported product from the company's own facilities abroad and other marketing activities, of over £25 million.
- 5.6 Data also exclude the retail value of sales either by the businesses surveyed or other retail outlets in the area. One ornamentals grower has a production turnover of £200,000 but this rises to £1 million if the company's garden centre operation is included. This company employs three full-time staff in production but sixteen including the garden centre.
- 5.7 For these reasons, together with the incomplete response to the survey, both in numbers of replies but also in the case of those respondents who did not provide turnover data, the figures collected represent a significant underestimate of the economic contribution of the glasshouse industry to the West Sussex economy.
- 5.8 One could also add a substantial figure, perhaps £50 million, to represent the turnover of companies producing and marketing intensive outdoor horticultural crops, such as salads, on the West Sussex coastal plain. It is entirely possible that such companies might have an interest in developing areas of protected crops in the future and some already have planning consent to do so. Their activities are also relevant in terms of other planning issues

**Table 5.1: Existing production areas and expansion plans**

Sector	Glass			Tunnels			Total	T/O	Expansion			Area m <sup>2</sup>		
	Heated	Unheated	Total	Heated	Unheated	Total	area	£'000	FTE	Glass	Tunnels	Glass	Tunnels	Total
	m <sup>2</sup>													
Edibles - total	771,635	24,380	796,015	0	38,992	38,992	835,007	51,935	816	17	31	238,000	0	238,000
Edibles - average	110,234	3,483	113,716	0	5,570	5,570	119,287	7,419	117	2.4	4.4	59,500	0.0	34,000
Ornamentals - total	613,947	79,641	693,588	3,000	85,852	88,852	782,440	46,409	472	92	82	80,500	22,440	102,940
Ornamentals - average	23,613	3,063	26,676	0	3,302	3,302	30,301	2,018	20	3.5	3.3	5,750	1,603	4,118
Grand totals	1,385,582	104,021	1,489,603	3,000	124,844	127,844	1,617,447	98,344	1,288	109	56.50	318,500	22,440	340,940
Grand averages	41,987	3,152	45,139		3,783	3,874	49,014	3,278	42	3.3	3.5	17,694	1,181	10,332

**Table 5.2: Grower attitudes and priority issues**

Sector	Confidence		Issues									
	Own	Others	Energy	Labour £	Labour Availability	Water	Returns	Land	Planning	P&D	Pesticide availability	Global warming
Edibles - total	15	21	8	10	14	17	7	14	10	17	18	31
Edibles - average	2.1	3.0	1.1	1.4	2.0	2.4	1.0	2.0	1.4	2.4	2.6	4.4
Ornamentals - total	66	78	52	51	49	69	32	86	59	54	47	78
Ornamentals - average	2.5	3.2	2.0	1.9	1.9	2.7	1.3	3.3	2.3	2.1	1.8	3.0
Grand totals	81	99	60	61	63	86	39	100	69	71	65	109
Grand averages	2.4	3.2	1.8	1.8	1.9	2.6	1.2	3.0	2.1	2.2	2.0	3.3

- 5.9 For the above reasons it is estimated that the total value of production (at wholesale prices) from glasshouse production in West Sussex is of the order of £120 million per annum; the total business turnover of these companies is of the order of £150 million; and the total output from all horticultural crops (including outdoor crops) is around £200 million.
- 5.10 The retail value of such production will not be confined to the local economy as products are distributed regionally and nationally but could be as much as £500 million per annum, over £8 per person of total UK population.
- 5.11 The total glasshouse area recorded was 161.7 hectares, with 83.5 hectares in edibles and 78.2 hectares in ornamentals. The average area was 4.9 hectares, with 11.9 hectares for edibles and 3.0 hectares for ornamentals. The area includes rented as well as owned glasshouses in some cases.
- 5.12 The variation in both glasshouse area and turnover is much greater for ornamentals than edibles, ranging from 400m<sup>2</sup> to 30.4 hectare of glasshouse area and £45,000 to £22 million in turnover. This compares with 0.41 hectare to 23.5 hectares of glasshouse area and £300,000 to £22 million in turnover for edibles. More detailed results can be seen in Tables 5.1 and 5.2 above.
- 5.13 In terms of employment, the figures provided show a total of 1,288 employees (Full Time Equivalent), 816 in edibles and 472 in ornamentals (averages 117 and 20 respectively). There is some uncertainty concerning these figures in terms of whether they relate solely to production or all activities on the sites and the employment definitions used (i.e. of Full Time Equivalence). A more thorough appraisal of the employment status of the industry and related implications for housing, education and training for instance, which the time and resources available for this project will not allow, would be worthwhile. Similarly an assessment of the employment provided by ancillary industries, such as suppliers, would be very useful.
- 5.14 Growers within the survey indicated an intention to expand total glasshouse area by 34 hectares, of which the vast majority (31.8 hectares) is for new glass, with 2.2 hectares for polytunnels. Edibles growers indicated the potential expansion of 23.8 hectares of glass and no polytunnels, with ornamentals growers indicating plans for 8 hectares of glass and 2.2 hectares of polytunnels.
- 5.15 These figures do not indicate any substantial development of polytunnels, e.g. for soft fruit growers, although planning application records show recent developments in this sector (see Chapter 6 - Planning Issues). This could simply indicate that such growers are not members of WSGA. Additionally, whilst all respondents have indicated the likelihood that they will erect more greenhouses, not all have indicated the potential area to be erected as this will be determined by circumstances at the time.

- 5.16 The authors are aware from this survey of a potential development of a large glasshouse complex in West Sussex on land owned by those with considerable experience in glasshouse crop production. An area of 5 hectares of the glass described above could be part of this development, but some of the area could also be made available to other growers. The land appears eminently suitable for glasshouse development.
- 5.17 The likelihood of these developments being proposed is considered greater for edibles growers (2.4 / 5 rating for glasshouses) than ornamentals (3.5 for glass and 3.3 for polytunnels). There was also much greater variation in replies from ornamentals growers in this respect, depending on the size of the business and no doubt the age of the grower and succession factors.
- 5.18 This also relates to replies on confidence in the future, with the average for edibles growers being 2.1 and that for ornamentals 2.5 but again with a much greater spread for the latter. In both cases growers expressed more confidence in the future of their own businesses than their sector generally.
- 5.19 An analysis of expansion plans was made according to the Districts in which sites are located. This is summarised in Table 5.3 below.

**Table 5.3: Analysis according to District Council areas**

	Council	Turnover £'000	Employees FTE	Expansion plans m <sup>2</sup>		
				Glass	Tunnels	Total
Edibles	Arun	7,000	70	80,000	0	80,000
	Chichester	44,635	742	158,000	0	158,000
	Horsham	300	4	0	0	0
	Mid Sussex	0.00	0	0	0	0
	Total	51,935	816	238,000	0	238,000
Ornamentals	Arun	14,750	217	26,500	14,240	40,740
	Chichester	27,644	175	54,000	8,200	62,200
	Horsham	3,815	77	0	0	0
	Mid Sussex	200	3	0	0	0
	Total	46,409	472	80,500	22,440	102,940
Totals	Arun	21,750	287	106,500	14,240	120,740
	Chichester	72,279	917	212,000	8,200	220,200
	Horsham	4,115	81	0	0	0
	Mid Sussex	200	3	0	0	0
	Total	98,344	1,288	318,500	22,440	340,940

- 5.20 The figures clearly demonstrate the importance of Chichester District with around three-quarters of the existing glasshouse area and value of output. Expansion plans also show about two-thirds of the total proposed area to be within Chichester District. This excludes any potential new development of the type mentioned at paragraphs 4.19 and 5.16.
- 5.21 The area served by Arun District Council is economically important nonetheless. It is also affected by potential housing development, which could impact on existing glasshouse sites north of Littlehampton, for instance. These could see the loss of some 17 hectares of greenhouses (14 hectares of glass and 3 hectares of polytunnels). With expansion of 12 hectares planned in the District, this would lead to a net loss of glasshouse area unless existing businesses relocate. If they were to do so, it is possible this might not be in Arun District but might represent a further migration westwards.
- 5.22 No commercially significant glasshouse expansion is anticipated in Horsham or Mid Sussex Districts.
- 5.23 Issues and priorities were rated as follows, placed in priority order for average replies i.e. both edibles and ornamentals:

**Table 5.4: Importance of issues for future prospects of businesses**

Issue	Ranking (1 = very important to 5 = not at all important)		
	Average	Edibles	Ornamentals
Returns (product prices)	1.2	1.0	1.3
Energy costs	1.8	1.1	1.9
Labour costs	1.8	1.4	1.9
Labour availability	1.9	2.0	1.9
Planning issues and constraints	2.1	1.4	2.3
Pesticide availability	2.0	2.6	1.8
Pest and disease problems	2.2	2.4	2.1
Water	2.6	2.4	2.7
Land availability	3.0	2.0	3.3
Global warming	3.3	4.4	3.0

- 5.24 Although all growers were agreed on the need for higher product prices ('a silly question', as one respondent put it), some of the differences in priority assessments between the edibles and ornamentals sectors can be explained as follows:

- growers of edible crops are generally more reliant on energy use;

- companies producing edible crops are generally larger than those producing ornamentals, have more intensive production systems and therefore have a higher labour requirement;
- more expansion is planned in the edibles sector, with larger individual companies, so planning issues and land availability are regarded as higher priority issues;
- growers of edible crops, especially heated ones, have developed Integrated Crop Management (ICM) techniques as an alternative to the use of pesticides, further than those of non-edible crops. This is because of the smaller range of pesticides approved for use on edible crops and the need to comply with legislation controlling pesticide residues in foods, together with the minimum intervals specified between application and harvest, especially in continuously harvested crops. For this reason edibles producers are less concerned about pesticide availability issues;
- growers of edible crops may see opportunities rather than problems arising from the potential consequences of global warming and even more significant economic and environmental opportunities from potential links with alternative energy sources.

5.25 Other issues raised included:

- business finance, currency fluctuations and exchange rates;
- costs of young plants, growing media, fertilisers and biocontrol, especially in the ornamentals sector (also affected by currency issues);
- transport and distribution costs;
- regulatory costs and red tape;
- effect of imports on prices;
- recruitment problems;
- supermarket power and dominance;
- recognition and establishment of Producer Organisations;
- political representation for horticulture and recognition of its economic importance;
- HDC levies (one respondent).

5.26 Issues which might have been anticipated but were not raised included the funding and availability of research and development.

## 6. Planning Issues

### *Key points*

- *There are no specific policies at a national, regional or county level for horticultural development, although all provide a supportive framework for agricultural (including horticultural) development*
- *Four Horticultural Development Areas (HDAs) were introduced in Chichester District in 1999 with the intention that new horticultural development should be directed to these areas*
- *There are no areas designated for horticultural development in Arun District but new glasshouses should be grouped with existing structures and avoid intrusion into open landscapes*
- *There have been applications for about 130 hectares of new or replacement glasshouses and polytunnels in the two Districts over the last sixteen years, which represents an average annual demand of over 8 hectares*
- *Nearly three-quarters of the area applied for has been in Chichester District*
- *Most applications in both Districts have been for the erection of new, rather than replacement, glasshouses and polytunnels, with the majority (101 hectares out of 113 hectares) for new glasshouses*
- *Growers in Chichester District have applied for relatively large areas of new and replacement glass; those in Arun have been mostly for smaller extensions to existing glasshouses*
- *High proportions of the applications have been permitted by the District Councils (85% and 93% in Chichester and Arun respectively), although the proportion permitted decreases as the size of the application area increases; consequently the area of new glass that has been permitted over the last sixteen years amounts to about 55 hectares, slightly over half the area applied for*
- *Only five appeals have been lodged against the refusal of applications for glasshouse developments in the two Districts in the last twenty years, with no appeals lodged since 2000*
- *The horticultural policies in both Local Plans have been saved until the adoption of the Local Development Frameworks, which are currently in preparation and will run until 2026*

- *It is likely that the principles of the current policies in both Districts will be carried forward to the Core Strategy of the LDF*
- *The Core Strategy in Chichester may entail a review of the HDA boundaries with the local planning authority eager to engage with the industry so that it is aware of opportunities and limitations*

## **Policies for Horticultural Development**

### *National Planning Policies*

6.1 Although there are no specific national planning policies for horticultural development, Government policies towards agriculture (which includes horticulture in its definition) are generally encouraging, with one of the Government's main objectives for rural areas set out in Planning Policy Statement 7 (PPS7), 'Sustainable Development in Rural Areas', as:

*“To promote sustainable, diverse and adaptable agriculture sectors where farming achieves high environmental standards, minimising impact on natural resources, and manages valued landscapes and biodiversity; contributes both directly and indirectly to rural economic diversity; is itself competitive and profitable; and provides high quality products that the public wants.”*

6.2 Paragraph 15 of PPS7 encourages a positive framework for facilitating sustainable development that supports traditional land-based activities, with local planning authorities advised in paragraph 16 that they should support development that delivers diverse and sustainable farming enterprises.

6.3 Paragraph 27 is concerned specifically with agricultural development, with the Government recognising the important and varied roles of agriculture, including in the maintenance and management of the countryside and valued landscapes. Local planning authorities are encouraged to support development proposals that will enable farming and farmers to:

- become more competitive, sustainable and environmentally friendly;
- adapt to new and changing markets;
- comply with changing legislation and associated guidance;
- diversify into new agricultural opportunities; or
- broaden their operations to 'add value' to their primary produce.

### *Regional Policies*

6.4 The South East Plan does not contain any policies for agricultural or horticultural development.

### *County Policies*

- 6.5 The West Sussex Structure Plan, 2001-2016, was adopted in 2004. Under the Planning and Compulsory Purchase Act 2004, its policies were due to expire in October 2007 although the Government decided that all but six of the policies would be saved beyond this point.
- 6.6 The Structure Plan recognises that a carefully controlled amount of development for agricultural and horticultural purposes (amongst other uses) will be necessary where it will help to maintain the economic and social well-being of rural communities.
- 6.7 Policy NE8 indicates that development which needs to be located in the countryside, such as agriculture and horticulture, should be permitted in order to sustain the countryside as a place of varied and productive social and economic activity, provided that the character and environment of the area is protected and, where possible, enhanced.
- 6.8 The County Council has also adopted a Rural Transport Strategy, the aim of which is to minimise the impact of traffic on the countryside whilst sustaining the rural economy. Within the Strategy, local planning authorities are encouraged to identify uses which are prevalent in their areas (with particular mention made of horticulture in Arun and Chichester Districts) and set out the criteria which will be applied to such proposals in local plan policies.

### *Local Plan Policies*

#### Chichester

- 6.9 In Chichester, four Areas for Horticultural Development (HDAs) were defined in the Chichester District Local Plan – First Review (1999). Two of these are sizeable areas (at around 180 hectares and 130 hectares) located on former airfields at Tangmere and Runcton (see Plan 6.1). The other two designated areas are drawn tightly around existing nurseries on the former Land Settlement Association (LSA) areas, and amount to about 65 and 80 hectares. The HDA policy has been saved until the completion of the Local Development Framework.
- 6.10 Policy RE11A sets out the following criteria that must be met by applications for new glasshouses and packhouses in an HDA:
- noise effects from machinery usage, vehicle movements or other activities on the site;
  - pollution effects on the soil, water and air environments;
  - effects of artificial lighting on nearby properties and the landscape;
  - effects of vehicular movements on road safety, amenities of local residents and the character of the surrounding countryside;

- effects of the height and bulk of the development on the character and appearance of the landscape.

6.11 The policy also requires that the local planning authority is satisfied that:

- adequate access arrangements exist from the HDA to the strategic road network; and that the proposed means of access uses roads capable of accommodating the vehicles to be used (with legal agreements sought to secure these routes);
- appropriate screening will be provided to prevent any noise nuisance or visual intrusion to local residents and the surrounding area;
- appropriate facilities are available for the disposal of surface water.

6.12 Policy RE11B allows for horticultural development outside the HDAs where sited in replacement of or in association with existing glasshouses, but not in areas of open countryside where glasshouses are currently absent. Such proposals will also be considered against the criteria included in RE11A.



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Figure 6.1: Horticultural Development Areas (HDA's)

Location: Chichester DC

Client: WSGA

**Reading  
 Agricultural  
 Consultants**



### Arun

- 6.13 Saved Policy DEV3 of the Arun District Local Plan 2003 indicates that new glasshouse and polytunnel development will usually be permitted provided that:-
- there is no adverse impact on the surrounding environment and landscape;
  - long views across substantially open land are retained;
  - adequate water resources are available; and
  - adequate surface water drainage capacity exists or can be provided as part of the development.
- 6.14 The policy also indicates that under-used or derelict glasshouses or polytunnels will not be considered as suitable sites for the introduction of non-agricultural uses.
- 6.15 The supporting paragraph 3.03 explains that horticulture forms an important part of the agricultural economy in Arun District and glasshouse crops have historically been grown on the coastal plain. However, the large buildings required for the indoor cultivation of crops are often intrusive and dominant in the landscape. New development should therefore, as far as possible, be grouped with existing glasshouses and avoid intrusion into open, attractive landscapes.

### ***Planning applications since 1993***

#### *Chichester*

- 6.16 Both Chichester and Arun District Councils have provided schedules of all applications received for glasshouse, polytunnel and packhouse developments since 1993.
- 6.17 The following table summarises the applications received by Chichester District Council over this period. It is important to note that where applications have been made to amend previously permitted applications, only the most recent application and decision is included in the table, so as not to distort the picture of demand. However, where a similar development on the same site has been refused but later approved, both applications are included.

**Table 6.1: Planning applications received by Chichester DC, 1993-2008**

Year	New glass <sup>(1)</sup> (ha)	Replace-ment glass <sup>(1)</sup> (ha)	Demolition (ha)	Total no of applications	% approval
1993	4 (0.13)	- (-)	- (-)	4	50
1994	5 (2.18)	2 (0.14)	- (-)	7	86
1995	11 (17.44)	1 (0.84)	- (-)	12	75
1996	10 (8.3)	1 (0.75)	- (-)	11	73
1997	8 (11.38)	2 (0.32)	- (-)	10	70
1998	4 (3.63)	1 (0.02)	- (-)	5	80
1999	7 (1.45)	- (-)	- (-)	7	86
2000	5 (2.13)	2 (1.44)	- (-)	7	100
2001	6 (2.95)	- (-)	- (-)	6	100
2002	9 (3.55)	1 (0.11)	1 (0.06)	11	100
2003	5 (5.95)	1 (1.26)	1 (0.05)	7	100
2004	6 (9.9)	1 (0.1)	- (-)	7	86
2005	3 (0.8)	- (-)	- (-)	3	100
2006	1 (2.08)	- (-)	1 (0.6)	2	100
2007	4 (13.7)	- (-)	- (-)	4	75
2008	1 (2.08)	- (-)	- (-)	1	100
<b>Total</b>	<b>89 (87.65)</b>	<b>12 (4.98)</b>	<b>3 (0.71)</b>	<b>104</b>	<b>85</b>

1) New glass refers to both glasshouses and polytunnels.

- 6.18 There were 104 applications made over this sixteen-year period, the vast majority (86%) of which has been for the erection of new glasshouses and polytunnels. There has been a marked decline in the number of applications submitted since 2005, with an average of 2.5 applications submitted per annum, compared to an average of 8 per annum prior to 2005. Particularly high numbers of applications were submitted in the mid 1990s.
- 6.19 The total area of new glasshouses and polytunnels that has been applied for in this period amounts to 88 hectares; and there have been applications to replace a total of 5 hectares of existing glass and tunnels. Of this total, approximately:
- 77 hectares has been for new glass;
  - 11 hectares for new polytunnels;
  - 2.4 hectares for replacement glass; and

- 2.6 hectares for replacement polytunnels.

- 6.20 Overall, this represents an average demand for nearly 6 hectares of new and replacement glass and polytunnels per annum, with demand particularly high in mid 1990s.
- 6.21 Eighty-eight applications or 85% of the total number of applications have been permitted by the District Council. This compares with a national approval rate for all types of development at District level of 82% in the last two years. However, given that half of the applications submitted nationally relate to relatively minor and uncontentious householder applications, the approval rate for new and replacement glasshouse in the District seems to be relatively high.
- 6.22 Forty-five applications (78%) for new and replacement glass have been permitted, with thirteen refused or withdrawn.
- 6.23 The distribution of the size of glass (excluding polytunnels) that has been applied for, and permitted, is categorised below (following the size groups shown in Figure 2.1):

**Table 6.2: Size distribution of the area of new and replacement glass applied for and permitted in Chichester District (hectares)**

	0<0.2	0.2<0.4	0.4<0.8	0.8<2	2<5	5+
No. of applications	21	10	6	11	4	6
No. permitted	18	9	6	8	3	1
% permitted	86	90	100	73	75	17

- 6.24 It is noticeable that growers in Chichester District are applying for relatively large areas of new and replacement glass compared to the existing national distribution of glasshouse size shown in Figure 2.1, with nearly half the applications for more than 0.4 hectare of glass. This supports the views and evidence in Chapter 4 that the unit size of glasshouse holdings in the area is likely to increase.
- 6.25 It is also noticeable that the proportion of applications permitted falls as the size of the application area increases, particularly with applications of over 5 hectares of glass. This is not surprising given the potential range and scale of impacts associated with large glasshouse developments.
- 6.26 Consequently, whilst the approval rate in terms of the number of applications submitted is relatively high, the area of new or replacement glass that has been permitted is nearly 34 hectares; less than half the area applied for. This represents an annual average of 2 hectares of new and replacement glass permitted.

- 6.27 Thirty-nine applications for new and replacement polytunnels have been permitted, with four refused or withdrawn.
- 6.28 In contrast to new glasshouses, the distribution of the size of polytunnels that has been applied for, and permitted, is heavily skewed towards the smallest size group.

**Table 6.3: Size distribution of the area of new and replacement polytunnels applied for and permitted in Chichester District (hectares)**

	0<0.2	0.2<0.4	0.4<0.8	0.8<2	2<5	5+
No. of applications	32	4	1	3	3	-
No. permitted	30	2	1	3	3	-
% permitted	94	50	100	100	100	-

- 6.29 However, the 30 permissions for polytunnels within the smallest size group account for an area of only 1.42 hectares within a total area permitted for all polytunnels of 13 hectares. The area of polytunnels that has been refused (in all size groups) amounts to only 0.67 hectare. Thus 95% of the area of polytunnels applied for has been permitted.

*Arun*

- 6.30 Table 6.4 summarises the applications received by Arun District Council since 1993. It should be noted that the following table does not include three current applications that are as yet undetermined, including a proposal for about 12 ha of glass at Park Farm, Lagness.
- 6.31 There were 61 applications made over this sixteen-year period, again with the vast majority (87%) for the erection of new glasshouses and polytunnels. As in Chichester District, there has been a decline in the number of applications submitted in recent years, certainly compared to the relatively high numbers submitted in the 1990s.

**Table 6.4: Planning applications received by Arun DC, 1993-2008**

Year	New glass <sup>(1)</sup> (ha)	Replace-ment glass <sup>(1)</sup> (ha)	Demolition (ha)	Total no of applications	% approval
1993	2 (0.83)	- (-)	- (-)	2	100
1994	5 (1.08)	- (-)	- (-)	5	100
1995	2 (0.07)	- (-)	- (-)	2	50
1996	8 (4.49)	2 (0.06)	- (-)	10	90
1997	1 (0.02)	1 (2.84)	- (-)	2	100
1998	8 (8.21)	1 (6.47)	- (-)	9	100
1999	3 (0.79)	- (-)	- (-)	3	100
2000	5 (1.03)	- (-)	- (-)	5	100
2001	7 (2.63)	1 (0.22)	- (-)	8	100
2002	1 (0.05)	1 (?)	- (-)	2	100
2003	2 (1.02)	- (-)	- (-)	2	100
2004	3 (0.08+?)	- (-)	- (-)	3	100
2005	3 (3.1)	1 (?)	- (-)	3	75
2006	1 (0.08)	1 (2.23)	- (-)	2	100
2007	1 (0.9)	- (-)	- (-)	1	0
2008	1 (0.26)	- (-)	- (-)	1	100
<b>Total</b>	<b>53 (24.64)</b>	<b>8 (11.82)</b>	<b>0 (-)</b>	<b>61</b>	<b>93</b>

New and replacement glass refers to both glasshouses and polytunnels.

?- Area of new or replacement glass not evident from application documents available

- 6.32 The total area of new glasshouses and polytunnels that has been applied for in this period amounts to 25 hectares, of which a total of 24 hectares has been for new glass; and there have been applications to replace a total of 12 hectares of existing glass.
- 6.33 Overall, this represents an average demand for under 2 hectares of new and replacement glass and polytunnels per annum.
- 6.34 Fifty-seven applications or 93% of the total number of applications have been permitted by the District Council, which is higher even than in Chichester District and significantly higher than the national average.
- 6.35 The distribution of the size of glass (excluding polytunnels) that has been applied for, and permitted, is categorised below (following the size groups shown in Figure 2.1):

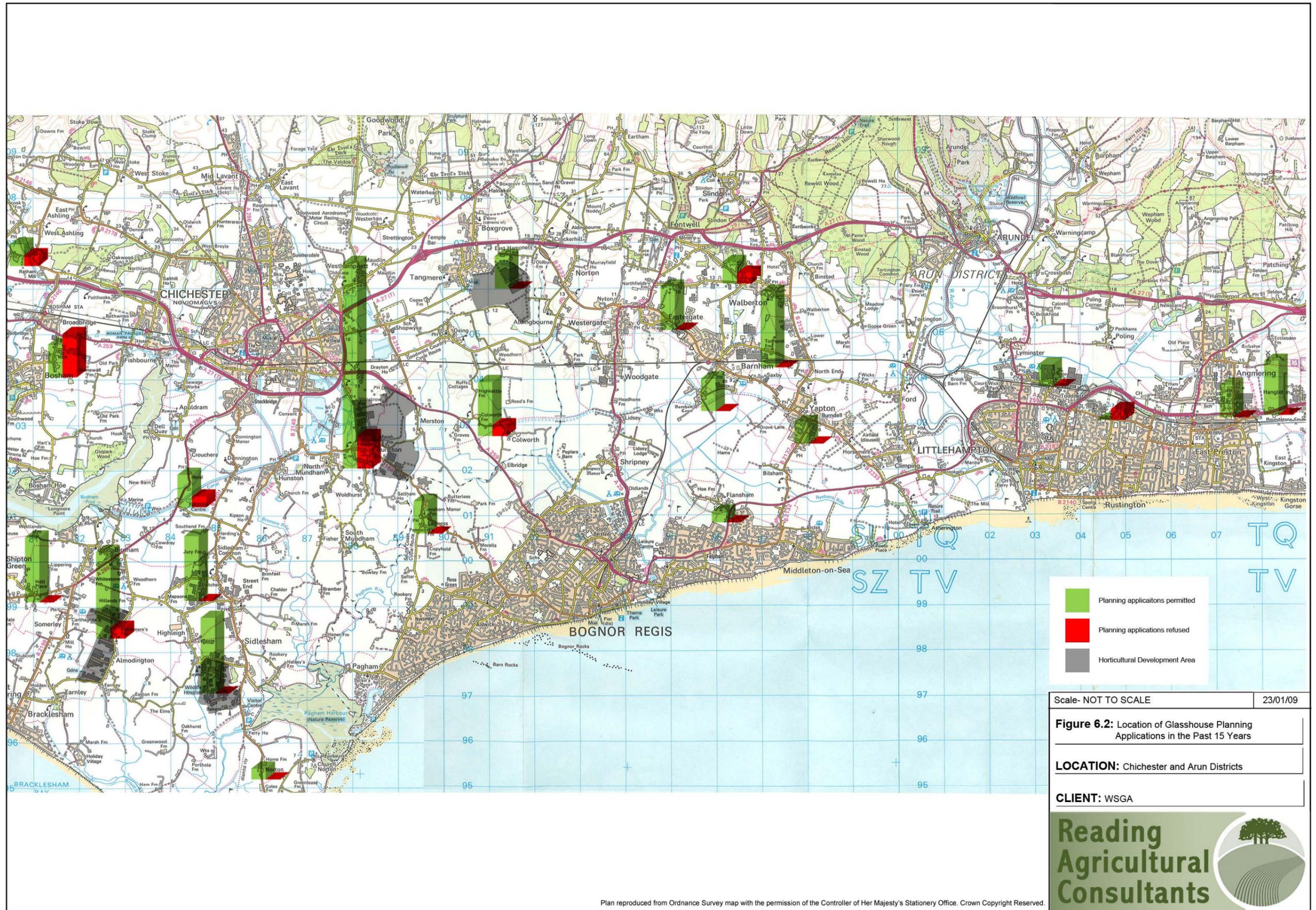
**Table 6.5: Size distribution of the area of new and replacement glass applied for and permitted in Arun District (hectares)**

	0<0.2	0.2<0.4	0.4<0.8	0.8<2	2<5	5+
No. of applications	22	3	2	5	4	1
No. permitted	20	3	2	3	4	1
% permitted	91	100	100	60	100	100

- 6.36 In contrast to Chichester District, two-thirds of the applications have been for relatively small areas of new and replacement glass of less than 0.4 hectare, most of which are extensions to existing glasshouses.
- 6.37 The four applications that have been refused amount to nearly 3 hectares of glass. Thus the demand for new glass has been largely satisfied in Arun District.
- 6.38 All applications for new or replacement polytunnels have been permitted as illustrated below:

**Table 6.6: Size distribution of the area of new and replacement polytunnels applied for and permitted in Arun District (hectares)**

	0<0.2	0.2<0.4	0.4<0.8	0.8<2	2<5	5+
No. of applications	14	3	1	-	-	-
No. permitted	14	3	1	-	-	-
% permitted	100	100	100	-	-	-



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### ***Planning appeal decisions***

6.39 Searches have been carried out of all planning appeals relating to refusals of permission for horticultural development generally in Chichester and Arun Districts.

#### *Chichester District*

6.40 In Chichester, there have been 19 appeals since 1987, of which the vast majority (15) related to dwellings on nurseries. Of these, 11 were for additional residential accommodation on a nursery, either in the form of a permanent dwelling (in five cases) or temporary caravans (in six cases), and four related to the removal of agricultural occupancy conditions attached to a dwelling on an existing or a former nursery.

6.41 Only four appeals have been lodged in connection with the development of additional glasshouses. Three of these were permitted, with the dismissed appeal allowed (with modifications to access proposals) a year later. There have been no appeals for additional glasshouses since 2000.

6.42 Two of the appeals related to proposals by Tangmere Airfield Nurseries Ltd to erect about 7 hectares of new glass on the old airfield (within an HDA). An appeal in 1997 was dismissed because the effects of the increased traffic generated by the proposal would be unacceptable to the rural character and appearance of the lanes, to residential amenities and to the safety of highway users.

6.43 However, an appeal in the following year for the same area of glass but with new access arrangements was allowed, with all the conditions attached relating to highway or landscaping matters.

6.44 The other two appeals, both allowed, concerned the development of about 1.77 hectares of replacement and additional glass at Walton Farm, Bosham in 1998 and about 0.85 hectares of glass at Wophams Lane Nursery, Birdham in 2000.

6.45 Both sites were outside an HDA, with the site at Walton Farm also within the Chichester Harbour Area of Outstanding Natural Beauty. However, in that case, the Inspector considered that, as the proposal was for the replacement (and enlargement) of existing glass and that there was potential for enhancing local landscape quality by the provision of screen planting, the proposal would not have an unacceptably harmful effect on the character and appearance of the area. He also noted that, as the glasshouses would be adjacent to existing ones and to other established ancillary agricultural buildings, the proposal would provide local employment, make use of an available natural water supply and the natural qualities of soil, light and air for which the area is renowned, and assist an existing business:

*“Relocation to a site within one of the Council’s identified ‘Horticultural Development Areas’ is not therefore, in my judgement, either a necessary or realistic proposition.”*

- 6.46 The proposal at Wophams Lane Nursery was also adjacent to an existing extensive area of glass and, in the Inspector’s opinion, would not have significantly increased the visual impact created by the existing glasshouse.

*Arun District*

- 6.47 In Arun, there have been only 12 appeals relating to horticultural developments since 1983. Most of these (seven) have also related to dwellings on nurseries (one of which was for the removal of an agricultural occupancy condition), two to retail use on existing nurseries or garden centres, two to other nursery facilities (office and incinerator) and only one to the provision of new glasshouses. This concerned a case in 1989, in which glasshouses were permitted at the Ferring Country Centre (the Centre is an independent charity which provides work experience and training for adults with learning difficulties).

***Views of the local planning authorities***

*Chichester District Council*

- 6.48 When consulted in 2002/03, as part of a similar project carried out in the Lea Valley for Epping Forest District Council, officers at Chichester District Council considered that, although there was still room for further horticultural development on all the HDAs, these new areas for horticultural development on the former airfields had been particularly successful. The key to the success of the former airfield sites was considered to be the new access roads that had been created from these sites to the strategic highway and away from surrounding residential areas. The Land Settlement Association areas were acknowledged to be characterised by a large number of smallholdings, many of which had been derelict for some time. The HDAs were intended to encourage the larger businesses to amalgamate some of these smallholdings and to regenerate the industry in these locations. However, problems of widespread dereliction still remain and the areas are severely disadvantaged in terms of access to the strategic highway network compared to the former airfield sites.
- 6.49 The District Council also indicated at that time that all recent glasshouse development had been contained to the HDAs.
- 6.50 The Council added that some operators on the former airfield sites had begun to add value by processing rather than merely packing produce, by including other (non-horticultural) ingredients. The District Council was intending at that time to produce supplementary planning guidance to encourage these processing activities on certain parts of the sites.

- 6.51 When consulted in 2009, officers of the District Council indicated that, although they acknowledged that there continue to be difficulties in making land available to horticultural businesses in some of the HDAs, it was likely that the HDA policy would continue into the Core Strategy of the Local Development Framework. Both policies 11A and 11B are regularly used and described as useful policies by the development control section. They are also considered to provide a degree of certainty to the glasshouse horticultural industry and can act as focal points for new glasshouse development.
- 6.52 However, officers indicated that the preparation of the Core Strategy may entail a review of the HDA boundaries, particularly in respect of Almodington and Sidlesham with their more fragmented patterns of land ownership, but that the industry needs to engage with the local planning authority in this review to make the authority aware of opportunities and stumbling blocks.

*Arun District Council*

- 6.53 When consulted in 2002/03 and again in 2009, the District Council indicated that there had a large number of planning applications for glasshouse development on the coastal plain in Arun District, mainly on Grades 1 and 2 agricultural land. The District Council indicated that the need for such developments has usually been justified, with the consequence that most developments have been permitted.
- 6.54 The District Council described the permitted glasshouses as usually extremely large, with the largest being over 7 hectares (at Newlands Nursery, Pagham). The Council has determined that a current application for the development of about 12 hectares of glass at Lagness required an Environmental Impact Assessment (EIA).
- 6.55 There are four main development control issues that have arisen from these developments. The first is drainage. The coastal plain is obviously low-lying and susceptible to flooding. Applicants have had to submit details on the means of discharging surface water drainage without exacerbating existing flooding problems to the satisfaction of the Environment Agency, as a statutory consultee. This has usually been resolved by the construction of large reservoirs which, as well as being used to irrigate crops, hold water until it can be discharged into the local ditch system when not at or near capacity.
- 6.56 The second issue is landscaping, and the need for the local planning authority to be satisfied that glasshouses are adequately landscaped to mitigate their impact on the rural character of the area.
- 6.57 The third is lighting. Many of the larger glasshouses are in use 24 hours a day and, at night-time, the lighting over such a large area glows in the night sky. In recent cases, the local

planning authority has placed conditions on planning permissions that details had to be submitted and approved to demonstrate how lights are to be shielded from the night sky.

6.58 The fourth issue is traffic, in particular the effect of large vehicles using country lanes.

***Emerging policy in the Local Development Frameworks***

6.59 A study into the future employment needs of Arun and Chichester Districts was jointly commissioned by the two District Councils ('Assessment of Employment Needs and Land Use Requirements, Atkins, 2005). The study is intended to form part of the evidence base used in preparing the emerging Local Development Frameworks, and its constituent development plan documents.

6.60 In respect of agriculture and related industries, the report indicated that:

*"Agriculture and related employment (including horticulture) remains an important sector in both districts. Given the existing strengths of the agriculture sector in both districts, this role will continue although expansion is unlikely to be significant. Central to the LDF process will be the need to facilitate on-going rural diversification through the promotion of positive rural enterprise planning and economic development policies. The evidence demonstrates that rural enterprise is critical to the economies of both Arun and Chichester. It will be essential to ensure that LDF employment land policies maximise their contribution to sustainable employment creation in rural locations having regard to other environmental and community priorities."*

6.61 A further review of employment land in Chichester District is currently being undertaken by Roger Tym & Partners. Although the report is still in draft, the report indicates that 5% (or 2,600) of Chichester's 52,000 jobs are in the agricultural sector which is dominated by the horticultural industry. A similar proportion (4.2%) of employment in Arun District is in the agricultural sector. This study confirms that the horticultural sector remains an important component of the District's economy which may not have been the impression gained from the earlier study.

6.62 Arun District Council is still working on its Core Strategy for the Local Development Framework, with progress having been delayed by debate over housing numbers and a proposed eco-town, and has not reviewed its detailed development control policies. The existing policy for glasshouse developments is therefore likely to remain in place for some time.

## ***Representations made to major planning applications and appeals in both Districts***

### *Chichester*

6.63 An examination of applications submitted to Chichester District Council in the last five years for significant areas of new glass or polytunnels has shown that there have been few letters of objection from the public or Parish Councils to such developments. Indeed, many of these developments have received the active support of the relevant Parish Council, as shown by the following examples:

- 2 hectare of polytunnels for soft fruit at Groves Farm, Colworth (2008); no objections from the public or Parish Council, although the latter was concerned that the site was not in an HDA and about the possible cumulative visual effects of plastic tunnels;
- 1 hectare of polytunnels for soft fruit production in Sidlesham (2007) received no objections from the public and Parish Council support;
- 10.5 hectares of new glass at Tangmere Airfield Nurseries (2007); withdrawn following objections from the Environment Agency and County Highways but no letters of objection from the public or Parish Council;
- 7.8 hectares of new glass at Marsh Farm, Runction (2004) received no objections from the public and Parish Council support;
- 4.5 hectares of new glass on Marsh Lane, Runction (2003); one objection from a local resident but none from the Parish Council although concerns expressed about traffic and light pollution.

6.64 It is however evident from the list of appearances at the appeal decisions mentioned above that there was interest from local residents in all these cases.

6.65 At the Tangmere Airfield Nurseries appeal in 1997, there were appearances from seven local residents, including representatives of the Parish Council and a local District councillor, who were concerned particularly about the effects of HGVs on the safety of highway users and their amenities. At the permitted appeal in 1998, when revised access arrangements were proposed, there were appearances from four local residents, including again the local District Councillor and Parish Council representative.

6.66 Representatives of local amenity groups and residents' associations also attended the Walton Farm appeal in 1998, and neighbouring residents the appeal at Wophams Lane Nursery in 2000.

*Arun*

6.67 An application for nearly 1 hectare of glass at Choller Farm, Walberton, which was refused in March 2007, received 20 letters of objection, 10 standard letters of objection and an objection from the Parish Council. The principal issues raised by the objectors concerned:

- traffic and highway safety
- light pollution
- visual impact
- hours of operation
- the employment of migrant rather than local labour
- lack of public transport links for workforce
- no need for new glasshouses
- effect on water supplies
- effect on existing tenant farmer (who would be displaced)
- need for additional buildings and concern that the site will develop into a mini industrial estate

6.68 The Officer's report, however, found that the use of land for horticultural purposes would be generally acceptable for this site but recommended that the application be refused because of:

- the lack of a Flood Risk Assessment or drainage study, following an objection from the Environment Agency
- highway safety and the lack of appropriate visibility splays, following an objection from County Highways.

6.69 The implication is that the matters raised by the local objectors were insufficient to outweigh the need for the development, or were matters that could have been resolved by planning conditions.

6.70 An application at Springfield Nursery, Barnham for 12 multi-span blocks of polytunnels, with a total footprint of about 2.2 hectares, to replace 40-year-old glasshouses was approved in 2006. There were no letters of objection from the public or the Parish Council to this application.

6.71 Similarly, an application to replace and extend existing glasshouses at Newlands Nursery, Pagham was approved in 2005, with no letters of objection from the public or the Parish Council.

## 7. Production and marketing issues

### **Key Points**

- *Transport is a key issue for both planners and growers, both in terms of efficiency and ease, and noise and reduction in amenity value*
- *High population density means that noise is an issue in production but records of complaints indicate this can usually be resolved*
- *Organic, Fairtrade, superfruit and 'Buy local' are all brands / issues which have had a positive impact over recent years*
- *Consumption of fresh fruit and vegetables has had year-on-year increases in the UK for a considerable period, and the WSGA members contribute to providing both local and national supplies*
- *Producer Organisations (POs) are a significant economic factor to the industry in the area*
- *There is more significant support for foreign growers than UK ones, who are thereby disadvantaged*

### **Production**

- 7.1 There are several key planning issues that are related to production, as summarised below. Opposition to development has often been more antagonistic to packhouse developments than to glasshouses, with most reasons being traffic-related.
- 7.2 Transport concerns relate to both lorries and tractors, with the primary issues being the number of movements, causing obstructions on the roads (blocking other road users and road safety), mud on roads and noise. These have more often related to outdoor salad crop production than production of glasshouse crops.
- 7.3 Much of the concerns over noise relates to energy equipment or out of normal hours working, especially for field crops. Council records show that there have been complaints about noise from energy equipment at Batchmere, Runcton and Jakes Nurseries, all of which have been resolved. There have also been complaints about operational noise, mostly related to field operations.
- 7.4 The visual impact of greenhouses has become more significant due to the greater size of units. The large areas of flat land needed for such developments are likely to be in rural areas but are also likely to have fewer neighbours than larger numbers of smaller sites. Temporary

field covers (Spanish Tunnels) have attracted more complaints since they have often been erected without prior notification to the planning authority, and thereby the public. There have been several key cases as to whether the erection of a polytunnel constitutes development (and thus requires planning permission), including Brinkman Brothers Ltd in Chichester District. The most recent case in the High Court (in 2006) concerned the construction of 40 hectares of Spanish tunnels for soft fruit production at Tuesley Farm, Godalming. The judge found that they did amount to development due to the degree of physical attachment to the ground, the work and hours required to erect and dismantle them, their degree of permanence and their size and cumulative impact. As a consequence of this judgement and the considerable expansion of the use of Spanish tunnels, some local planning authorities (particularly Herefordshire Council) have produced supplementary planning guidance on polytunnels to assist growers in preparing planning applications for these developments.

- 7.5 Other visual impacts arise mainly from crop cover plastics, both on ground and in tunnel form. Glasshouses cause less reflected light issues because of the very high light transmission of the glass used and the orientation of the panes. Additional issues are with temporary staff accommodation, particularly where these comprise significant 'villages' as at some sites.
- 7.6 The annual value of output from glasshouses in the WSGA area is estimated as being £102 million. This is calculated on the basis of the turnover from the 150 hectares covered in the project survey for which turnover figures were provided, scaled up to the 167 hectares for the county in the DEFRA statistics. It is an underestimate of the total value of the industry and excludes the value of products marketed by companies in the area which are not produced there. These may be from sites owned by the company elsewhere in the UK or abroad, or from other growers. It also excludes turnover from companies involved in marketing the substantial value of intensive outdoor salad crops grown in the area who might have an interest in protected cropping in the future. The value of output from all horticultural businesses in the area is estimated at over £150 million.
- 7.7 The survey results from WSGA members suggest that the DEFRA estimate of the farm-gate value of protected crops of £505 million per annum is a considerable underestimate as they indicate that over 20% of the national value is produced by less than 10% of the national glasshouse area.

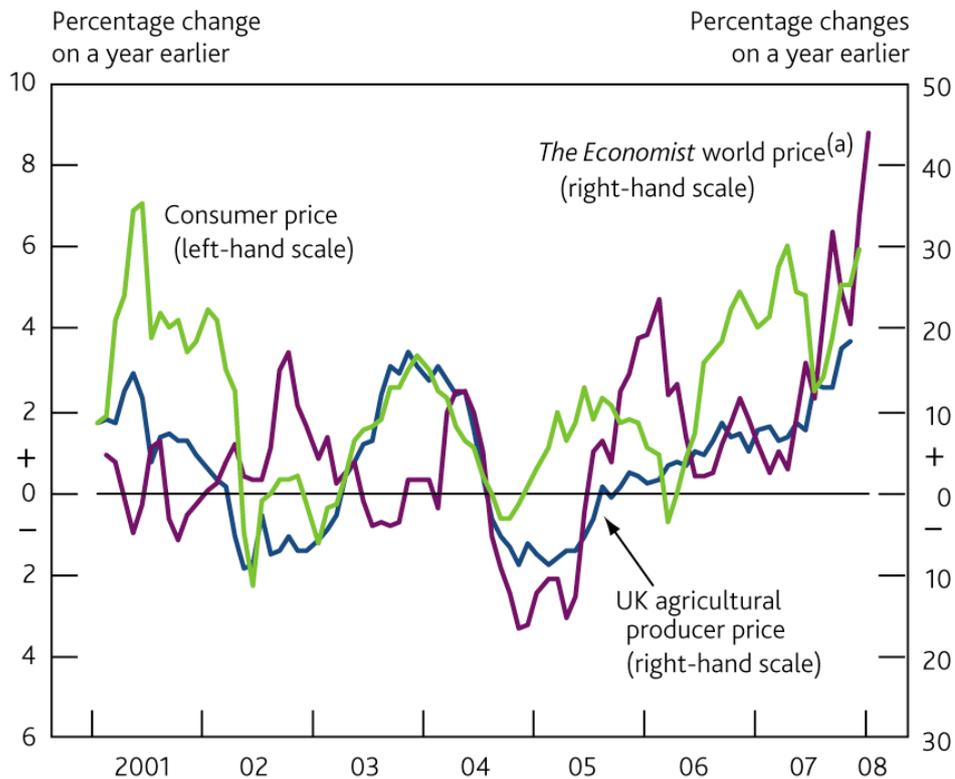
### ***Marketing - UK national issues***

- 7.8 The market for fresh produce is increasing, partly due to the expansion in population and partly due to the increased consumption per head resulting from an awareness (both real and perceived) of the health benefits associated with fresh produce. The total UK population was last static in 1982, since when the annual increase has risen steadily to 300,000 per annum,

with a population of 56 million in 1982 increasing to 61 million in 2008 (Office of National Statistics, 2008).

- 7.9 The fresh produce market is still dominated by multiples with in excess of 80% of volume. Flowers and plant sales are less dominated by the main multiples than fruit and vegetables.
- 7.10 Individual consumption of fresh fruit and vegetables (excluding potatoes) rose from 1,410 to 1,560 g/person/week in the UK between 1988 and 2005 (DEFRA).
- 7.11 Food prices, along with commodity prices generally, rose significantly in 2008, though prices paid by retailers to suppliers for glasshouse products, compared with say cereals, have not risen in line with inflation over this period. This is no doubt why returns paid to growers are afforded the highest ranking of all the issues raised by growers in the project survey.

**Figure 7.1.: Consumer, producer and commodity prices in the UK**



*Trends within increased sales*

Organic

- 7.12 The organic market rose rapidly, with 22% growth achieved in 2005-2006, and a total sales value of almost £2 billion (Soil Association, 2007). However, recent growth has been negative, with a 10% drop in the 3<sup>rd</sup> quarter of 2008, despite total food sales increasing in value by 6% during this period. In the longer term, it is probable that there will be a return to increased organic sales once economic conditions return to growth again. The economic downturn has

also encouraged retailers to develop and promote more basic and 'value' lines compared with added value, premium products.

- 7.13 One area of concern for this sector is that the 'Buy Local' and 'Food Miles' arguments often count against organic, with only 66% of UK organic sales being produced in the UK, and even less qualifying under most definitions of local.

#### Fairtrade

- 7.14 Historically Fairtrade branding has not been applied to significant portions of fresh fruit and vegetables, although recent developments have included mangoes and pineapples for the Co-Operative Society. The main component of fresh fruit and vegetable sales is bananas, with Fairtrade bananas having a retail value of £150 million in 2007 and accounting for 25% of total banana sales.
- 7.15 There have been certain significant high level conversions to Fairtrade in other food sectors, notably Tate & Lyle which announced in 2008 that it was moving to 100% sourcing of sugar products from Fairtrade-accredited suppliers, planned over the following two years.

#### 'Superfruit'

- 7.16 The increase in berry sales has been dramatic, particularly with blueberries (130% increase in sales between 2004 and 2006) and cranberries. Sales of berry fruit have doubled since 2000, and annual sales are now around £300 million (excluding an unknown quantity of road-side and small trader sales).

#### 'Buy Local' campaigns

- 7.17 The support given to local production has undoubtedly increased over recent years due to an increased awareness of Food Miles and the importance attached to local businesses and employment. This is exemplified by the Asda 'Locally produced in Sussex' campaign, which (according to Asda) will have five stores selling county-produced food direct from store rather than via a distribution centre. Asda consider that its countrywide campaign will reduce food miles by 7 million per year. This is achieved by increasing the number of local hubs, with a further 15 added (to 2008). The local initiative can be a two-edged sword, since it may reduce competitiveness by reducing volumes, and by allowing other direct imports to gain an economic advantage (for example Asda is now shipping some imported goods direct to Teeside for supplying its northern stores and if, as is likely, this shipping will come via Rotterdam, it will pick up foreign fruit en route).
- 7.18 Other major retailers plan regional marketing campaigns and many link products to individual growers, with the grower's name and photograph on the pack.

### Farmers' Markets

7.19 There are several Farmers' Markets locally, principally Chichester, Brighton, Lewes, Petworth, Southsea, Petersfield and Arundel. The true value and trends for Farmers' Markets are difficult to gauge reliably, with huge variation between them both in terms of amount of actual local produce from commercial producers and the value of sales. It is believed that Farmers' Markets account for around 1% of total sales, although the value of farm-gate or "honesty box" sales is probably almost as significant. Generally they are not a significant market for larger-scale producers.

### ***Packing stations and distribution***

7.20 Although many growers have their own, smaller packhouses, there are ten larger units in the WSGA area (see Chapter 4 West Sussex Glasshouse Industry for more on this). The majority of them may handle produce imported from overseas for at least part of the year.

7.21 There are four main supermarket distribution depots close to the region (see Chapter 4 West Sussex Glasshouse Industry for more on this) which cover the main retailers, whilst facilitating local supply where this is available.

### ***Traffic issues***

7.22 Traffic concerns have been a major factor in considering packhouse developments in particular. One respondent in the project survey reported a delay of 18 months by the Highways Agency in considering traffic implications arising from the replacement of an inadequately sized packhouse, even though the new packhouse would have no greater throughput than the old one and generate no increase in vehicle movements.

7.23 Planning authorities have on occasion used applications for the re-development of sites to introduce more stringent controls, notably at Third Avenue, Sidlesham. Conditions attached to the most recent development at Batchmere restricted deliveries to the hours of 07.00 to 19.00 whereas prior to this it was unrestricted. The restrictions proposed by the Council were originally more stringent but were modified by the Committee. Bedding plants present a particular challenge in terms of traffic since the production window is relatively short compared to most crops.

7.24 The Brinkman's Nursery submission in 2008 for 11ha of glass at Park Farm, Lagness has lorry movements of 28 per day (peak) and 11 per day (off-peak). Local residents were mobilised to protest against this largely on basis of traffic. The Parish Council and two adjoining ones objected on the basis of traffic volumes.

7.24 There have been frequent complains to Chichester District Council with the main sites and issues summarised below:

- HGV traffic and parking at Brinkmans, Bosham (see for example Bosham Parish Council minutes March 2005). This was resolved by the use of Chichester lorry park;
- Tractor vehicles on roads: congestion, safety and road fouling. This was resolved by 'tractor' hotlines;
- HGV traffic around Runcton / Walnut Tree area;
- HGV volumes, damage to verges and road safety at Third Avenue, Almodington. This has been on-going over many years with various resolutions achieved, including the introduction of a one-way system of turning.

7.25 The composting facility at Walnut Tree Farm has a Waste Management Licence for 25,000 tonnes per annum, which is likely to involve around 3,500 vehicle movements. There have been various complaints over odour emissions from this, although it appears to be resolved now.

### ***EU impacts***

#### *Pan-European integration*

7.26 The most significant impact of the EU is in many ways indirect, in that it has fostered the establishment of many pan-European production companies. This started with growers in the UK establishing production facilities in Spain and Portugal, followed by Eastern Europe, and has now moved to major purchases of UK companies by other European ones. The major player is the RAR group which now has controlling interests in Wight Salads and owns Vitacress. Tangmere and Langmead Farms have sites in the Iberian peninsular.

7.27 Thanet Earth is a more recent example of Dutch growers shifting production from the Netherlands to the UK (see Chapter 4, West Sussex Glasshouse Industry).

7.28 Langmead Farms also has a production facility and marketing operation in California, USA.

#### *Producer Organisation (PO) groups*

7.29 POs are legal organisations whose members must have the general aim of:

- promoting the use of environmentally sound cultivation and waste practices;
- ensuring that the organisation's production is planned and adjusted to demand;
- promoting concentration of supply; and
- reducing production costs.

7.30 Once recognised, POs are able to submit Operational Programmes (OPs) aimed at encouraging the use of environmentally friendly techniques and improving the quality,

marketing and end value of produce. These programmes attract EU funding. They can contain many elements but must include the following obligatory objectives:

- action to develop the use of environmentally sound techniques by PO members with regard to cultivation practices and management of waste; and
- provision for the technical and human resources required to ensure the monitoring and compliance with EU marketing standards and rules on plant health requirements and maximum permitted levels of residues.

7.31 The effect of the PO is to subsidise certain investments by a member that are theoretically meant to help the group as a whole, and this is achieved by matched funding provided by the UK Government (EU funds).

7.32 POs could have a significant impact on the local industry. The demise of the Wight Salads PO had a strong negative impact on the local industry, and loss of other POs would also impact adversely on producers in the region. As with most political initiatives, the long-term future of the PO is unclear, although they have been around in the UK for the past 14 years. Attempts are currently being made to establish a new PO in the area. Growers of ornamental crops do not qualify for PO status.

#### *Support within the UK*

7.35 The most significant support for the industry is the PO scheme, which is summarised above, and can offer up to 50% support for approved items.

7.36 Other sources of useful support are related to energy saving and to renewable energy production, such as the competitive tender support package offering up to 40% of capital costs for biomass fuelled co-generation schemes.

7.37 The Enhanced Capital Allowances scheme is a tax offset mechanism for energy efficient installations.

#### *EU support*

7.38 Competitor nations are primarily those in Southern Europe, and to a lesser extent the Netherlands. Support from the EU has been mostly for extensive developments of new protected cropping areas in the Iberian Peninsula, particularly Spain where current levels of support are at 30% of capital cost. France and Italy have also received support although to a lesser extent.

7.39 In addition to direct capital support, there is also indirect support in many forms. For example in Denmark, growers can receive around 400% of that received by growers in the UK for electricity produced by CHP on site, with gas prices at similar levels. This is due to the

abnormal UK energy prices which are deemed unsustainable at present by most analysts (c.f. Parliamentary Select Committee on Energy Report) and are likely to change in the next two years. For many growers this has represented a more substantial income than that derived from cropping. Indirect support in Spain has also been seen through improvements in infrastructure that have assisted the horticultural industry, including improvements to roads, docks, storage facilities and, not least, water supplies.

- 7.40 The Dutch glasshouse industry has recently received a substantial financial 'windfall' due to a Government policy to relocate much of the glasshouse sector to the south of Rotterdam and away from the traditional Westland glasshouse area which has been designated for housing development through the expansion of towns such as Zoetermeer. Although not direct support, this did allow many growers to re-build, modernise and expand and the resulting boom effectively tripled the new glass area being built over a two-year period.

*Outside the EU*

- 7.41 Morocco has become a major food exporter to the EU, and several UK, European (notably Spanish) and Gulf companies are investing in production facilities. The Moroccan horticultural sector is also in receipt of assistance from the EU and the World Bank. Morocco has significant trade barriers from the EU, with limits on the quantities of most major commodities, such as tomatoes. Interestingly this does not include organic produce. Morocco has restricted the right of overseas investors to purchase agricultural land, with deals having to either have local partners or to be long-term leasehold. Some of the support from the EU and World Bank is passed on to investors through aid packages for infrastructure, in particular, and tax breaks. There is some capital support available, plus infrastructure support in terms of water supplies, roads and ports.

## 8. Energy and environmental issues

### *Key points*

#### Energy

- *Energy remains a key component of the industry, and price volatility is a significant issue*
- *The long-term energy picture for the UK nationally is a worrying one in terms of price stability and security of supply, and government inaction and bad policy will take many years to overcome*
- *There are some infrastructure issues within the WSGA area, with insufficient capacity or network*
- *By preference the industry would use Natural Gas*
- *The industry is ideally suited to host highly efficient distributed energy projects, although there are relatively few of these within the WSGA area compared to nationally*
- *The industry is ideally suited to host renewable energy schemes but there will be additional planning considerations for these particularly in respect of haulage*
- *The trend for encouraging local production/buy local is likely to be a net benefit to the WSGA members*
- *The significance of carbon tax and carbon credits has diminished and is likely to remain low for the foreseeable future*

#### Environmental

- *Water abstraction is a potential problem for the industry*
- *Other environmental issues (pesticides, pollution etc) do not pose a significant problem to the industry*
- *One environmental concern is regulatory costs and implications*

## **Energy**

### *Supply security*

8.1 The primary fuel used in the local industry is Natural Gas (NG), with some growers burning both light and heavy oils, and very limited use of coal. Natural Gas is now sourced from three principal regions - offshore UK, the inter-connector to Norway, and the cross Channel inter-connector which derives supplies from various countries but largely Russia.

8.2 The recent National Energy Foundation (NEF) report paints a bleak picture for the UK energy scene, and especially for Natural Gas. The key findings are as follows:

- the UK will be the largest sovereign net importer of gas in the near future;
- the UK is the fifth largest consumer of Natural Gas in the world;
- the additional capacity from the Norwegian and Dutch inter-connectors (and to a lesser extent the Liquefied Natural Gas (LNG) terminal) will not be sufficient to meet demand;
- UK demand for gas to satisfy the cheap CCGT generators (for electrical power generation) will continue to dominate the market.

8.3 The second most important fuel is electricity, and sites with significant packing operations or young plant raisers in particular have relatively high electrical consumption. The NEF report predicts that prices will remain high due to the following factors:

- a need for huge investment in new generation capacity as older power stations reach the end of their design life;
- the reliance on an expensive fuel (Natural Gas) for a significant percentage of generation;
- additional clean up costs for older power stations;
- a lack of excess capacity;
- incompetent trading arrangements (BETTA) introduced by the government regulator.

### *Costs*

8.4 The over-riding message of the current situation is that there is a period of extreme volatility in market prices, which is likely to remain for some while. Many of the previous linkages in prices (gas/oil/electricity) seem to have been broken, such that it is hard to make accurate predictions of future energy prices. UK gas and electricity prices have each been both the highest and the lowest (median quarter prices) in the EU within the past four years (Quarterly energy indices). Although historically the south-east of England has seen higher prices than the north, due to greater consumption than generating capacity, the differential has reduced recently.

### Gas prices

8.5 The Department for Business Enterprise and Regulatory Reform (BERR) has claimed that the inter-connectors and LNG terminal will help stabilise prices, but the House of Commons Select Committee and the NEF both consider this to be wildly optimistic, and experience over the past two years would seem to confirm this (see graph below).

**Figure 8.1: Wholesale gas price January 2007 – December 2008**



8.6 There are now two LNG terminals operational, with a third nearly operational. However, it is worth noting that the current two do not operate at full capacity, so the theoretical capacity from these is not likely to be as important as availability at reasonable cost of sufficient LNG.

8.7 An additional concern in terms of gas prices is the recent formation of the Gas Exporting Countries Forum (GECF), which appears to be an attempt to establish a cartel along the lines of OPEC.

8.8 The construction of significant gas storage capacity within the UK is likely to have more of a price stabilising effect, and there are ambitious plans to achieve this. These cater for the storage of approximately 20% of annual UK demand, at 20 billion m<sup>3</sup> capacity.

8.9 The gas network within the WSGA area is reasonable, although there are capacity issues on the main from Chichester to Selsey.

### Oil prices

8.10 The price of oil has recently (December 2008) converged to its previous historical parity with gas, for the first time in around 18 months. During this period of volatility it has been both higher and lower than gas.

**Figure 8.2: Brent crude oil price over the six month period July '08 – Dec '08**



Coal prices

8.11 Coal prices historically have been the most stable of all but, during recent energy price volatility, they doubled. They are now dropping back again and are likely to return to somewhere near their historic levels.

Electricity prices

8.12 UK electrical wholesale prices have risen sharply over the past two years, as many long term contracts for primary energy ended and had to be renewed at significantly higher prices. The prices are now starting to fall, and futures markets show significant falls for 2009. Falls of around 30% from peak are predicted.

**Figure 8.3: Electricity - Annual Forward Baseload Price**



8.13 There are capacity issues on several areas of the network within the WSGA area, notably around Runcton and Selsey.

*Predicted energy trends*

Energy and the environment

8.14 Academic studies, such as those funded by Defra, have suggested potential environmental benefits from importing foodstuffs such as tomatoes from southern Europe, compared with growing them in heated glasshouses in the UK. These studies compare only energy use in trucking produce from Spain with that used for heating glasshouses in the UK. As such, they are over-simplistic, if not flawed. They assume Spanish production is from outdoor crops, whereas fruit exported here is grown in polythene-clad greenhouses. The satellite image below of Almeria gives some impression of the area of plastic greenhouses there. Production in these facilities is much less efficient than in UK glasshouses and about five times the area is needed for the same amount of production. The polythene covering, which is made from oil, has to be replaced every two years or so and disposed of in some way, compared with a minimum lifespan of 25 years for a glasshouse in the UK.

**Figure 8.4: Satellite image of Almeria, southern Spain**



- 8.15 The current predictions for climate change and global warming, if realised, would improve the conditions for growing crops such as tomatoes in the UK, but not further south, where supplies will be threatened. Climate change may also fuel increased demand for salads and fruit here because of changed dietary habits in the future. We are told to expect more extreme weather events from climate change and it seems reasonable to conclude that growing crops in glasshouses is an effective way to protect them against such threats and to ensure reliable supplies.
- 8.16 UK growers have reduced their energy use significantly in the last two or three years to reduce their carbon footprint and to constrain their energy costs. The glasshouse industry has a contract with government to meet increasingly stringent energy reduction targets as part of the Climate Change Levy agreement.
- 8.17 Glasshouse crop producers also have great opportunities to link into surplus energy streams from industrial or agricultural processes to avoid the waste of this energy and to produce valuable food products such as tomatoes from its use.
- 8.18 An example of such opportunities is that of Combined Heat and Power (CHP) or co-generation. This involves the combustion of primary fuels to generate electricity, which is normally then sold into the national grid, from the site. The heat generated in the process, which has to be dissipated in conventional power stations through cooling towers, can then be

used to heat the glasshouses instead. This makes power generation around 80% rather than 40% efficient.

- 8.19 If the primary energy source is clean enough, as in the case of natural gas or biogas produced from anaerobic digestion of organic material such as plant waste, carbon dioxide can be extracted from the combustion gases to supplement the glasshouse atmosphere. This produces significant increases in production, of salad crops in particular, through enhanced photosynthesis and reduces greenhouse gas emissions in the process.
- 8.20 The deregulation of the UK electricity market, which resulted in falling electricity prices at the same time that gas prices were rising steeply, severely hampered the exploitation of this technology in the UK. This was not the case in Holland where growers gained a significant economic advantage. This is now changing in the UK and the development of anaerobic digestion technology to produce biogas from plant waste is an additional opportunity for growers. This will enable them to avoid such material going to landfill and the considerable cost and environmental damage involved.
- 8.21 Another opportunity is to use surplus energy from processes such as British Sugar's refinery in Norfolk, where glasshouses produce tomatoes on an area of 106,000 m<sup>2</sup>. The glasshouses are heated and provided with CO<sub>2</sub> from the 70MW turbines powering the refinery. This gives the company very significant economic advantages at times of high energy costs, as well as robust environmental credentials.
- 8.22 In addition to Spain and other southern European states, the UK imports considerable quantities of produce from EU states which have no climatic advantages over the UK, if anything the reverse. These include Holland, Belgium and Poland.

#### Fuel source

- 8.23 Natural Gas will remain the dominant fuel, although there is likely to be an increase in renewables, which are summarised below.

#### Biomass

- 8.24 Biomass is likely to be primarily wood and straw. Biomass accounted for almost 50% of UK electricity generated from renewable sources in 2007. There is sufficient resource of both these fuels for the industry locally to take up if desired. This could also tie in with other land-based industries in the area to integrate production of energy crops with demand from the greenhouse sector, although purpose-grown crops are not economically viable without government support (subsidy).

### Energy from waste (including biogas)

- 8.25 There are significant opportunities for greenhouses to utilise energy from waste, since they provide a more or less constant load throughout the year. Although there have been various potential large-scale projects, none has yet come to fruition. To date the only significant project is Guy & Wright Ltd, who have installed an anaerobic digester which takes organic waste and provides 0.5MW of generating capacity on site.
- 8.26 There is a moderate quantity of organic waste from food processing and packing in the WSGA area but a very large resource of putrescible domestic waste, which raises the possibility of synergy between the industry and local authorities in establishing a waste/energy centre. The obligation on Local Authorities to reduce and eventually eliminate use of landfill for waste disposal, coupled with Government directives on suitable technologies, is steering this towards Energy from Waste (EfW) plants using gasification and pyrolysis or anaerobic digester technologies.

### Other renewables

- 8.27 The only other significant potential sources of renewable energy for horticulture in the WSGA area are wind or geothermal. Geothermal is of two main types, high and low grade. Low grade requires electric heat pumps to upgrade it to usable form. Within the WSGA area it is unlikely that there is a high-grade source at reasonable depth (with current drilling technology) and therefore installations to date have tended to use heat pumps with associated high capital costs. The British Geological Survey indicated that Southampton had the main viable geothermal source in England. The existing Southampton geothermal plant has a drill depth of almost 2000m. Capital costs for such a scheme on a nursery are likely to be around £1.5 million for the drilling alone, and paybacks greatly in excess of normal timeframes for the industry. One potential source of geothermal energy would be to utilise exploratory oil drilling (assuming that no oil is found), although this requires good co-ordination as licence requirements normally stipulate that wells must be capped afterwards. Capping is more sophisticated than the name implies, and effectively renders the well useless for further work.

### On-site generation

- 8.28 The horticultural industry had a period of heavy third-party investment in Combined Heat and Power (CHP) in the late 1990s. CHP offers extremely high levels of efficiency of more than 90%, compared to only around 20 - 30% for a coal-fired power station and only 60% for a modern Combined Cycle Gas Turbine (CCGT), and is a rapid means of increasing utilisation of fossil fuels. There are a few installations within the WSGA area, notably at VHB Runcton (4MW(e)) and Tangmere Airfield Nurseries (8.8MW(e)). Recently there have been difficulties with the economics of such large schemes, due to the electricity trading arrangements

introduced that favour larger generators over distributed ones. The few recent CHP installations (for example Jakes Nursery, Sidlesham) have all been grower-owned.

#### Fuel efficiency

8.29 The main driver for increased fuel efficiency is the reduction in basic energy costs, although there are other factors which assist marginally. These include the Climate Change Levy (tax on fossil fuels) and carbon credits.

8.30 Most growers have instigated energy-saving measures, notably including the following.

- installation of improved environmental computer controls, often with Temperature Integration;
- installation of thermal screens;
- Variable Speed Drives for main electric motors; and
- improved humidity control.

8.31 Growers within the WSGA area are generally at a high level in this respect.

#### Closed greenhouse

8.32 This is a technology that has been developed in the Netherlands and is in effect a harvesting and storage of solar energy, utilising heat pump technology to store and re-use energy.

8.33 The technical concept consists of a combined heat and power unit, heat pump, underground (aquifer) seasonal energy storage as well as daytime storage, air treatment units, and air distribution ducts. Active air circulation by ducted fans is one of the key elements for controlling the climate (temperature, relative humidity and CO<sub>2</sub>) at crop level.

8.34 Energy is stored in two aquifers, one used as a store of cooler water and the other for warmer water. The differential is then used to drive the heat pump in heating or cooling mode. Aquifers have to be relatively static otherwise energy will merely move from one location to another.

8.35 The results of a trial using a fully closed 1400 m<sup>2</sup> demonstration greenhouse for tomato production showed the following:

- reduction in primary energy (fossil fuel) use of 20 and 35% respectively for an “island” closed greenhouse and a closed-conventional combination greenhouse;
- increase in tomato yield of 20%;
- an 80% reduction in chemical crop protection;
- a 50% reduction in use of irrigation water;

- an overall improvement in energy efficiency of 50%.

8.36 Geologically the UK is less well supplied with suitable aquifers to exploit these opportunities than Holland. The economics of the fully closed greenhouse even in Holland are questionable because of the high initial capital cost. Research on semi-closed greenhouses is proceeding in the UK to seek to achieve some of the benefits without all of the costs. The systems involve the low level ducting of air around the glasshouse to improve the crop environment, improve crop performance and reduce energy use. One such trial site is in West Sussex.

#### Climate Change Levy (CCL)

- 8.37 Historically the government agenda has been to raise CCL taxes as an incentive to reduce emissions but, with the confirmation of the EU Emissions Trading Scheme (see below), this may now change. The horticultural sector has large scale rebate (80%) but has to meet significant energy reductions over time with an approved registration scheme to assess this. Theoretically CCL will be matched to inflation although, as with Road Fuel Duty, this may be politically altered at any time according to other factors and energy reduction targets necessary to attract CCL rebates have recently been increased by government.
- 8.38 Electricity generated by Good Quality CHP (CHPQA scheme) is exempt from the CCL, as is gas purchased for feeding the CHP. CHP schemes can therefore offer a saving to the grower of around £15,000 per hectare. This additional cost of CCL is similar across the UK but not across the EU

#### Carbon trading and credits

- 8.39 The largest of the three main systems that came out of Kyoto is the EU Emissions Trading System (EU ETS). There is also a large voluntary scheme operated by the Chicago Climate Exchange (CCX) and its European wing, the European Climate Exchange (ECX). Under an ETS, countries or sectors have an allocation of carbon credits. If emissions exceed allowances, credits must be bought, if emissions are below allowances, credits can be sold.
- 8.40 The current price on the ETS is €13/tonne CO<sub>2</sub> equivalent (with a recent high being €30/tonne); and US\$1.5/tonne CO<sub>2</sub> equivalent on the CCX (in December 2008, which had dropped from \$6 in June 2008).
- 8.41 The EU ETS 1<sup>st</sup> phase was 2005-2007 (commencing in January 2005), with the 2<sup>nd</sup> phase from 2008 to 2012 (which is also equivalent to Kyoto's 1<sup>st</sup> commitment period). Units are tonnes CO<sub>2</sub> equivalent (i.e. they can include other greenhouse gases such as methane) and are traded as EUAs (EU Allowance Units).
- 8.42 Kyoto is legally binding with fixed penalties (€40 per tonne during 1<sup>st</sup> phase and €100 per tonne during 2<sup>nd</sup> phase). The payment of penalties does not remove the requirement to

purchase credits to cover excess and the company loses the equivalent number of allowances from the subsequent year.

- 8.43 To date most schemes do not include agricultural production, partly due to complexity (for example, measuring livestock methane emissions and the role of forestry as a carbon sink and as a harvest) and partly for protectionism.
- 8.44 'Voluntary' markets are shorthand for those 'credits' which are not counted towards Kyoto targets. Significant non-Kyoto markets include the US and Australia which operate in a similar way to EU ETS but have less stringent registration and verification systems. Different methods and regulations apply to different voluntary markets and mechanisms. In general, projects must be registered, have suitably verified baselines set and then submit to whichever system of monitoring and verification procedures apply. Theoretically, therefore, there seems to be no inherent barrier to horticulture becoming involved in some form of Carbon market. The precise ways and means have yet to be formulated.

#### Renewables Obligation Certificates (ROCs)

- 8.45 CHP can be combined with other forms of renewable fuels, with the electrical output then eligible for the Renewables Obligation Certificates (ROCs). These have a monetary value which varies slightly each year. Typical value is around 3.5p/kWh, and most of the schemes relevant to horticulture attract double ROCs of about 7p/kWh.

#### Finance (see also Chapter 9: Capital Investment Issues)

- 8.46 In terms of energy, the significant grant support relates to biomass (including biogas) co-generation schemes. This scheme is a competitive bid system with support in the range of 25 to 40% of capital expenditure.
- 8.47 Although ideally situated to benefit from this opportunity, many growers will be hampered by a lack of capital, especially under the current financial situation. Also historical sources of funding, such as selling land for development or the involvement of third party energy companies, are not currently attractive.

#### Glasshouse Hubs

- 8.48 There have been several instances in the Netherlands of constructing greenhouse 'parks', which contain a centralised heat and power source, possibly central packhouses, with greenhouses clustered in such a way as to optimise heat/cooling balances and energy efficiency. The first similar project in the UK is under construction in Thanet, Kent (Thanet Earth). The £80 million Thanet Earth project to build the 91-hectare site is expected to create more than 550 jobs. A consortium of seven specialist large-scale producers of tomatoes, peppers and cucumbers from Holland is involved in the project although currently only three

Dutch growers are constructing glass there. In planning terms there will be issues with these hubs, not just because of the overall scale of development but because of the issues raised by centralised energy plant and packing facilities.

8.49 The project website [www.thanetearth.com](http://www.thanetearth.com) states:

*“British consumers are eating more and more salads, but most of the crops in our supermarkets have to be imported. This development will add significant amounts of British-grown produce to the supermarket shelves, helping reduce food miles and the time it takes to get a tomato from plant to plate”.*

8.50 The Thanet Earth project is located in an area which is not a traditional glasshouse one and on land previously used to grow vegetables. The project has enjoyed considerable support from local authorities in its facilitation and planning as well as grant aid. The Dutch consortium will no doubt benefit from EU aid as a Producer Organisation. Thanet is also recognised as an Assisted Area in the UK where financial assistance under the Selective Finance for Investment in England scheme (SFIE) is available. SFIE grants are available across the whole district to both large corporates and small and medium-sized enterprises (SMEs). Grants are paid to new and existing businesses looking to invest in capital equipment, expand and modernise facilities, increase productivity and safeguard and create skilled jobs. Projects can involve capital expenditure on fixed assets such as land or property and plant or machinery.

8.51 A project approaching this scale is being considered in West Sussex. The authors' understanding is that the site owners would undertake some of the development themselves but also offer the opportunity for other investors to become involved in a co-operative venture.

8.52 One interesting possibility within the WSGA area would be a combination of a greenhouse hub and a putrescible waste-to-energy scheme. This could provide a symbiotic relationship between local government, with an increasing need for both recycling of organic material and sourcing of renewable energy, combined with the greenhouse industry's desire for more large-scale blocks of land. It could also alleviate some of the transport issues associated with large glasshouse sites.

### **Transport**

#### *Energy*

8.53 The National Road Traffic Forecasts (NRTF) (1997) predicted a growth in HGV traffic (with 1996 as the baseline of 100) to 186% by 2021. The historic growth rate for HGV traffic has been 4.8% per annum.

- 8.54 Historically there has been a very good correlation between GDP and traffic growth. The current GDP contracted by 0.5% in the third quarter of 2008 (ONS) (or by 1% according to NIESR), so it is likely that HGV traffic will decline for the next few years.
- 8.55 The high cost of road transport fuel (see graph below) tends to reduce traffic volumes both by reduced total volumes and by increased utilisation factors.

**Figure 8.5: RHA bulk fuel prices**



*Aviation fuel*

- 8.56 This is of importance for imports, some of which are brought in by air. Aviation fuel is taxed at a much lower rate than other fuels, and hence gives these imports a tax advantage, especially when compared to UK haulage costs where there is a very high fuel duty. This has been a political issue for a while, due to the recognition that the aviation industry is a major environmental polluter, and the EU is moving slowly towards including aviation in the EU ETS. Various airlines (Virgin, Air New Zealand) have now operated large jets successfully on biofuels, and it is likely that this trend will increase partly because of economics but more significantly because of image.

*Local food and food miles*

8.57 The environmental impact of importing products from distant production areas, compared with the impact of local production in glasshouses, has been the subject of some research as described earlier in this chapter. It is a complex analysis of all factors, including:

- the amount of fossil fuel used to produce, process, package and distribute food, with consequent implications for CO<sub>2</sub> emissions;
- the vulnerability of relying on imported food supplies;
- the lower nutritional values associated with long shelf-life varieties of crops used to withstand lengthy transport and handling systems;
- the increased risk and incidence of the spread of crop and animal diseases with imported produce;
- the environmental, economic and social impact of the intensive production of crops for export on the exporting developing country.

8.58 It is readily apparent that the social, environmental and political pressure to reduce food miles should encourage UK production in all agricultural and horticultural sectors. The DEFRA report, 'Understanding Consumer Attitudes and Purchasing Behaviour with Reference to Local and Regional Foods', (June 2008) indicates that the main driver in purchasing behaviour is consumer demand (45%) which is influenced most significantly by the following:

- support for the local economy (40%);
- improved freshness (32%); and
- quality (31%).

(Environmental impact came 8th on the list).

8.59 The Trade Quantitative Survey showed that more than 70% of buyers considered that the trend for buying more locally sourced produce would continue over the next five years, with 60% having bought more locally sourced produce over the previous five years. Buyers consistently under-rated the consumer's main reason for buying local, viz supporting the local economy, and this is perhaps something of significance for the WSGA members.

## ***Environmental***

### *Pollution*

#### Emissions (see also Carbon Trading above)

- 8.60 The main gaseous emissions are results of combustion, particularly CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>x</sub>. As can be seen from Table 8.1 below, NG is a particularly clean fuel, and therefore the industry is not generally considered to be a heavy polluter. The growing of organic matter also means that there is considerable carbon sequestration and, if CO<sub>2</sub> from flue gases is utilised to enhance crop yield, then there is a net gain in this respect.

**Table 8.1: Comparison of Air Pollution from the Combustion of Fossil Fuels (kilograms of emission per TJ of energy consumed)**

	Natural Gas	Oil	Coal
Nitrogen Oxides	43	142	359
Sulphur Dioxide	0.3	430	731

### Noise

- 8.61 Like all industries horticulture has certain noise issues although, being rurally based, these can be more noticeable due to lower levels of background noise and unrealistic expectations of neighbours. There have been examples within the WSGA area where planning applications for the replacement or extension of glass have been used by the local planning authority to impose tighter conditions on the overall unit (for example at Batchmere) which is contrary to the guidance in PPG24, 'Planning and Noise', that Planning Authorities "should not use the opportunity presented by an application for minor developments to impose conditions on an existing development which already enjoys planning permission."

### Light

- 8.62 The general form of conditions on new glasshouse sites should restrict light pollution by the installation of blackout screens. This has been successfully applied in several new planning approvals within the area (for example at Batchmere, Runction and Newlands), with a typical condition worded as follows:

*"No (supplementary) lights shall be used within the glasshouses during the hours of darkness unless shielded from external view by blinds."*

- 8.63 Such conditions provide a satisfactory solution to the problem of light pollution and are in line with other parts of the country, especially along the South Coast, and with the Netherlands.

## *Water*

### Drainage from roof water

- 8.64 Glasshouse roofs represent a large surface area for rainwater to run off instantly, thus having the potential for increasing the risk of flooding. This is normally alleviated by installing buffering reservoirs that will reduce the discharge to the equivalent of normal run-off from a grass field. Council Drainage officers within the WSGA area work to this basis for new planning applications, as do most other planning authorities in the areas of glasshouse concentration (such as the Lea Valley). With a correctly designed system there should therefore be no change to immediate surface water flows, although there will be a reduction in sub-surface flows. For replacement glass there should be a benefit in terms of reducing current discharge rates such that a new glasshouse with buffered discharge could reduce instantaneous flow rates by in excess of 90% of an older unit with direct discharge to a storm drainage system.
- 8.65 The need to deal with roof water discharge provides economic and environmental opportunities. If the stored roof water is used for irrigation of the glasshouse crop and the storage capacity is capable of accommodating annual rainfall, the site can theoretically approach self-sufficiency in annual water supply. This assumes the recirculation of irrigation water when, with an annual water demand for long season tomatoes, as an example, of 750 litres/m<sup>2</sup>, and a long-term average rainfall of 720 mm for Bognor Regis, rainfall could provide over 90% of annual crop demand. In practice it is likely to be less than this because of factors such as the evaporation from the reservoir water surface.

### Ground pollution - agro-chemicals

- 8.66 Integrated Pest Management (IPM), using natural predators instead of pesticides, has become almost universally adopted within the northern European glasshouse industry and by all UK glasshouse tomato and pepper growers for instance. This has been one of the factors that has enabled many glasshouse crops to be grown organically, the main changes required being growing in the soil and changes in fertiliser regimes. British tomato growers have targeted the elimination of all pesticide applications within the next ten years, although cucumber growers are some way behind this.
- 8.67 Although pesticide use has been the focus of sustained attention and campaigns by environment groups such as Friends of the Earth, achievements by British growers in reducing pesticide use have probably not yet secured any significant market advantage other than in niche markets. This is because of the competition from low priced imports from southern Europe and the attraction these represent to buyers, especially with a strong pound.

- 8.68 Production of horticultural crops in southern Europe and the Mediterranean basin has been highly reliant on pesticide use, compared with the UK. Although efforts are now being made in Spain to reduce this, with some success, because of its cost, increasing ineffectiveness and consumer unacceptability, a 2004 study estimated that 19, 16 and 24 times more pesticide active ingredients were applied per kg of tomatoes, sweet peppers and cucumbers respectively in Almeria than in the Netherlands. [Ed. W. Bokelmann; Sustainability of Greenhouse Fruit Vegetables: Spain versus the Netherlands; Development of a Monitoring System. Acta Hort 655, ISHS 2004]. Fewer pesticides are used in the UK than in Holland and the UK target for tomatoes is zero use.
- 8.69 Environmentally-friendly means of pest and disease control are of increasing importance. All major UK retailers subscribe to the Assured Produce Scheme and their UK suppliers register under this scheme and adopt the production protocols embodied in it. These protocols focus increasingly on environmental protection. Compliance entitles producers to use the 'Red Tractor' logo on their packs. There are several audit protocol schemes operating, including GlobalGAP, BRC Global and Nature's Choice. In addition there are industry group schemes, such as that operated by British Ornamental Plant Producers.
- 8.70 Over recent years there has been a loss in registration of many agro-chemicals, and this has provided more impetus for finding alternative crop protection strategies to the use of pesticides.
- 8.71 Fertiliser pollution of groundwater has become significantly reduced due to the increased use of recirculation systems for substrate-grown crops and the use of container benching with ebb and flood. The recent high cost of fertilisers has also hastened this trend. Research has provided opportunities to use much lower input levels of nitrates and phosphates in particular.
- 8.72 The EU Thematic Strategy review of pesticides (91/414) moves their use from a risk to a hazard based assessment method which will result in the loss of registration of a significant number of pesticides. This is likely to have a more negative effect on exporters from Europe than UK producers.

#### Extraction of water - ground water issues

- 8.73 Water use in UK production is very much more efficient than in Spain, where water availability has become a critical environmental, socio-political and economic issue. Water supplies are even being tankered into the country and those produced by desalination require a very high energy input.
- 8.74 In the UK, demand for water per unit output has reduced over recent years, partly due to improved control techniques including sophisticated plant water stress monitors, and partly by increased re-use. Many sites are now recycling irrigation run-off, thus saving on water use by

around 25% and also reducing fertiliser requirements and potential pollution since the water that is re-used contains the feed, etc, which would otherwise go to waste.

- 8.75 The majority of sites within the WSGA area have reservoirs for roof water run-off which is used for irrigation water, and makes a significant contribution to supply. The remainder tends to be drawn from boreholes.

#### *Waste*

##### Plastics

- 8.76 According to the Environment Agency, horticulture in the WSGA area generates 3.2 to 4.7kg/ha principally of plastic sheet. These figures are open to question, as they also suggest that mid Wales has the highest density of horticultural plastic arisings, which is implausible.

##### Scrap metal

- 8.77 The main sources of scrap metal are old greenhouses, which are all recycled (steel and aluminium).

##### Asbestos

- 8.78 Although there has been a problem with the high prevalence of this in boiler house installations these have mostly been dealt with in the WSGA area.

##### Agro-chemicals (see section on groundwater pollution above)

- 8.79 Any surplus agro-chemicals and used containers have to be dealt with under approved schemes.

##### Green waste

- 8.80 A large proportion of green waste from the industry is now composted locally, with much of the remainder going to landfill.

#### ***Transport***

##### *General*

- 8.81 There have been and are issues within the WSGA area, notably the Runcton interchange. This is a combination of both increased horticultural activity and significant increases in residential traffic through new developments at Selsey.

##### *Fuel* (see also above sections on energy)

- 8.82 Natural gas has a significant environmental advantage over other fuels that is frequently taken for granted, in that it is transported 'invisibly' by pipeline. The vast majority of other fuels, including most renewable ones (biomass), require transport by road haulage into site. For

many biomass fuels the most significant cost involved is that of haulage, since fuel itself attracts a lower duty (in some cases none) than road fuel, which is extremely high. As a simple example wood fuel may be bought in for around £30/tonne, of which at least 30% is likely to be haulage costs. Transportation charges for NG are around 5%.

#### *Peat and other growing media*

- 8.83 Peat (or equivalent growing media) is generally brought in by truck, with smaller growers buying in plastic-wrapped bales and larger ones buying in bulk deliveries. There has been a trend in recent years for major buyers of ornamentals to insist on peat-free compost, and production systems are now in place for this to be used. Composting of plant material from crops and vegetable waste from packhouses is also of significant current interest and EU Directives and UK legislation encourage the composting of green waste and the recycling of pots and packaging. Appropriate technology and suitable sites are a prerequisite for efficient, nuisance-free operations.

#### *Packaging*

- 8.84 Most horticultural produce requires packaging, typically either cartons (boxes) or pots or plastic wraps. This is all designed to be minimised in transport, with on-site assembly (boxes or form-feed plastic wrap) or nesting of containers (pots and punnets). The exception to this is polystyrene, which constitutes the main nuisance packaging due to bulk and lack of recycling potential.

#### *Packhouses*

- 8.85 In addition to local produce, there is a percentage of imported produce which is packed in the local operations. Packhouse operations can generate significant lorry movements.

#### *Staff*

- 8.86 Although most staff use individual car transport to and from work, there is a significant degree of car sharing and, on larger sites, there are also minibus services which reduces car numbers dramatically. There are proposals currently under consideration within the area for some sites to construct bicycle routes for staff.

#### **Wildlife**

- 8.87 In general there are issues for greenhouse sites, as there can be a conflict of interest in terms of external wildlife issues between the benefits of natural habitat and the demands of supermarkets in respect of weed, pest and disease control. There are some sites that are notable exceptions to this, and the increased installation of reservoirs and SUDS drainage schemes is assisting in this.

## 9. Labour Issues

### *Key points*

- *WSGA growers' responses within this study show that labour cost is the most important concern regarding inputs, equal with energy*
- *Third most significant is labour availability. There is a shortage of skilled workers in the horticultural industry at all levels due to its labour-intensive and seasonal nature and perceived low rates of pay*
- *The HDC survey of 2006 showed that labour costs accounted for around 40% of inputs for the national industry*
- *There has been significant investment in automation and mechanisation in many sites, both edibles and non-edibles. The cost of this equipment combined with its complexity means that there are significant calls on highly skilled labour*
- *Automation and lower labour input systems require much larger greenhouses than were common previously*
- *The large number of small businesses that were characteristic of the industry in the area some years ago were much more reliant on family labour. This allowed more flexibility in available hours and expenditure, especially in difficult times, but did not encourage succession*
- *Although larger businesses are more efficient in labour use and afford mechanisation opportunities, they create a greater demand for staff at supervisory and managerial level. These are now in short supply*
- *Local seasonal and casual workers have been more difficult to find. As a result, the horticultural industry has turned increasingly to employment agencies to source workers from abroad, particularly eastern Europe, especially through schemes such as SAWS. This labour pool has become increasingly involved in more managerial roles*
- *The industry is still a significant local employer, despite the use of migrant workers. It is estimated that around 1,300 full time local jobs are provided within the West Sussex protected crops sector, excluding those working for suppliers to the industry and in support services.*
- *Accommodation is and will continue to be a major headache for employers of large numbers of seasonal workers and local planning authorities. Many sites have significant investment in mobile homes / caravans on site. Some higher level staff are provided with houses on site.*

- *Growers of long-season crops such as peppers, tomatoes or year round flowers under glass tend to have less problems recruiting staff, especially from eastern Europe, because they can offer a longer period of regular employment, a higher annual salary and better working conditions*
- *The fall in value of the UK currency against the Euro and linked currencies in eastern Europe such as the zloty, will cause a fall in income for those staff remitting earnings to their families in eastern European countries. Expanding economies in those countries following EU membership may also induce workers to return there*
- *It is likely that local employment within the industry will increase over the foreseeable future due to increased local availability and expansion.*

### **Labour skills, availability and costs**

- 9.1 Historically horticulture has relied on family dynasties to provide managerial labour, generally through ownership of the business. As businesses have become larger and less family owned (see Chapter 4: The West Sussex Glasshouse Industry) this has not been so applicable, and staff have come via graduate routes in many cases.
- 9.2 The industry is heavily dependent on seasonal and casual workers for activities such as sowing, planting, harvesting, grading and packing.
- 9.3 Competition for skilled workers is a widespread problem, with labour shortages at all levels as much of the work still remains labour-intensive, even though computer technology and business management are becoming increasingly important.
- 9.4 Growers have responded by increasing automation and mechanisation, which can reduce handling and improve labour efficiency but requires considerable capital investment.
- 9.5 Newer greenhouses lend themselves to greater levels of automation and labour efficiency, in both sectors. In the edibles sectors rows have become significantly longer (>100m now compared to 20m 30 years ago) and in the non-edibles sector use of transport container benches and automatic stillages. Both these require significantly larger greenhouses than hitherto, and often cannot fit into existing sites.
- 9.6 An employment survey by the Horticultural Development Council in 2006 showed major effects on staff employed according to business size and crop sector. The largest businesses i.e. those above the £300,000 levy band (21% of HDC members) employed:
- 72% of the almost 4,000 supervisors employed;
  - 69% of the estimated 27,000 regular workers employed;

- 76% of all casual worker 'days.' The survey found that HDC growers employ the equivalent of 20,000 full time workers on a casual basis.

9.7 Soft fruit and field vegetables growers were found to have the greatest need for regular and casual workers, as can be seen from Table 9.1 below. It can also be seen that protected crops companies, both of ornamental and edible crops, employ a much higher ratio of 'growers' to regular and casual staff than do other sectors. This no doubt is representative of the intensity and complexity of these businesses and the technology involved. The supply of younger and trainee managers is a concern to many WSGA members.

**Table 9.1: Distribution (%) of the Employment of Workers by Type of Business**

Crop category	Growers	Regular workers	Casual workers
Hardy nursery stock / bulbs & flowers	21	26	11
Ornamental protected crops	21	9	6
Edible protected crops	9	4	6
Field vegetables	17	33	42
Top fruit	14	7	12
Soft fruit	7	19	31
Others, no predominant crop	4	11	2
Total	100	100	100

Source: HDC, Horticultural Employment in Great Britain – A Survey Among HDC Growers, 2006

- 9.8 The level of skills required within the industry will continue to rise, especially in information technology and production, in order to increase the diversity of the food crops and ornamentals. Larger businesses will require skills focussing on intensive production technology whilst smaller nurseries will need more emphasis on practical production skills. Business management and marketing skills will also become more important if growers are to remain competitive.
- 9.9 Although there are two distinct sides to the labour requirements of the horticultural industry (i.e. skilled and seasonal/casual workers), some training needs overlap. Many larger growers in the area invest heavily in training, and there is significant co-operation with Chichester (Brinsbury) College. There is evidence that in some areas, such as production specialisms, energy efficiency, the use of predictive techniques and pesticide management, suitable training and the associated qualifications are lacking. By not being able to meet the needs of the industry, training providers are failing to reduce the lack of skilled employees, particularly at NVQ/SVQ Level 3 and above. Although qualifications are not a substitute for skills, they enable an employer to establish the level of knowledge a potential employee may have.

- 9.10 Both unskilled and skilled labour will typically be expected to be more expensive in the WSGA area than say in Humberside, partly to compensate for the generally higher cost of living. Labour costs typically represent approximately one-third of total costs (including overheads).
- 9.11 The availability of staff to work on glasshouse nurseries represents an increasing problem and, in recent years, it has become more difficult to employ seasonal and casual workers due to the low unemployment rate, the type of work, low rates of pay and/or the problems of being on and off benefit.
- 9.12 Current economic pressures may alleviate this situation and provide more recognition of the value of the industry in providing employment, even in hitherto high employment areas such as West Sussex. This may therefore assume a higher priority in considering planning applications for glasshouse development.
- 9.13 The glasshouse industry has turned increasingly to the employment of staff from abroad (Eastern Europe in particular) through arrangements such as the Seasonal Agricultural Workers Scheme (SAWS) and more recently after the EU enlargement with freedom of travel for the ascensions states.
- 9.14 Problems had arisen when restrictions were made to SAWS in 2006 and there were threats to phase out the scheme in 2010. Lobbying by the industry has seen the Home Office announce an increase in the size of the Scheme quota however, to reflect the particular difficulties experienced by the horticulture industry. Our current understanding is that there will be an increase in the SAWS quota by 5,000 for 2009 i.e. from 16,250 to 21,250.

## 10. Capital investment issues

### *Key points*

- *The horticultural industry is a highly capital intensive form of land-based production, which has become more capitalised over the years*
- *In the highly competitive industry, the need for economies of scale dominates*
- *Lack of available land, planning constraints leading to a high cost for suitable land, combined with a lack of a level playing field (considerable grant support is available elsewhere in Continental Europe as well as occasionally in the UK) have pushed several growers to develop and invest outside the WSGA area*
- *Modern glasshouse structures are much larger than their predecessors but have a longer lifespan (around 25 years in good condition) and are considerably more energy-efficient*
- *A typical glasshouse holding of more than 2 hectares for edibles production would cost around £550,000 per hectare to establish*
- *A typical glasshouse holding of more than 2 hectares for young plant production would cost over £1.14m per hectare to establish*
- *The cost of plastic-clad multi-span tunnels, of the higher end variety on a large scale, is around £225,000 per hectare including internal fittings*
- *The cost of field cover (Spanish Tunnels) is around £55,000 per hectare for a 2 hectare plus area*
- *The cost of land has historically been a relatively small proportion of the overall costs of developing a new glasshouse unit. However, this land price (suitable for glasshouses with planning consent) has risen sharply in the south of England, as supplies have dwindled.*
- *There is a wide range paid, but typical prices would be from £40,000 to £100,000 per hectare if sold within the horticultural sector. Higher prices than this have been quoted for land in the area with planning consent for glasshouse development but are doubtfully economic for this purpose and have yet to be realised. Arable land that could be used for field tunnels, or conceivably for glasshouses after a planning application, may be bought for £30,000 to £50,000 per hectare.*
- *There are high values for land held for hope value but, by definition, this land will not be available to develop for horticultural production.*

- *Sources of capital are primarily banks and the sale of assets (land), with some limited support from government.*

### **Greenhouse type definitions**

- 10.1 For the purposes of this report capital costs have been split into two principal types: glasshouses and plastic-clad structures.
- 10.2 Within the glasshouse definition it has been assumed that the majority of installations will be Venlo-type with a single sheet of glass from gutter to ridge with no lap joints. This makes the structures more robust and also far more energy-efficient as they are more airtight. A modern Venlo structure will typically be 20 – 30% more energy-efficient than older types. They can be multiplied up with 'floating gutters' to reduce the number of posts internally, and the most common sizes are 9.6m (triple 3.2m) and 8m (double 4m). Some new structures are using 9.6m from a double 4.8m, and there are a few 12m from triple 4m.
- 10.3 There is considerable variation with plastic-clad structures but generally they may be categorised as temporary field structures (so called Spanish Tunnels) and multi-spans, which are a lower cost alternative to glass.
- 10.4 In absolute terms the cost of structures per unit area has decreased over the years, since structures have become much larger and therefore have less sides and ends per unit area. Utilisation (i.e. the amount of the structure that is actually used for growing rather than for access) has increased, thus helping to increase output per unit input. This has also decreased the energy consumption per unit area (smaller surface area per area of footprint). Eaves heights of Venlo houses have increased considerably over the years, from around 2m to current heights of 4.5m – 5.8m. This is partly to accommodate different cropping techniques (such as high wire crop support systems) and partly to increase air volume and thereby buffering (i.e. slowing down of internal climate changes due to external meteorological ones). This prevents external weather changes having rapid internal effects, notably on humidity levels.

### **Potential glass development areas**

- 10.5 New glasshouse sites should ideally have the following benefits:
- **level site.** Although this is an ideal requirement it is not as significant nowadays due to the relatively low cost of earth moving (cut and fill) and it is not unknown to excavate 1-hectare platforms on slopes of 20 degrees. For larger platforms the degree of slope is less important than the overall volume of earth moving, which is topographically dependent and is assessed individually;

- **high natural light levels.** The WSGA area has some of the highest natural light levels in the UK, due to the southerly latitude and the effects of being near a large estuary and coastline. There will be a decrease with distance from the coast;
- **good access,** sufficient for articulated vehicle of 12m and close to the strategic highway network;
- **close proximity to a natural gas main.** Ideally this would be within 1,500m but this will depend on network capacity about which it is hard to generalise (see Chapter 8 Energy). Gas supplies in the Sidlesham and Almodington areas in particular are constrained.

10.6 Other services are principally water, electricity and telecoms. There are several parts of the WSGA area where electricity supply is significantly constrained, and SSE is in the process of reinforcing significant parts of the local network (notably the Runcton and Sidlesham areas). Water supplies are becoming more constrained, with increasing concern over long-term aquifer levels. Flood prevention is becoming an increasing issue and therefore it is likely that these two combined will impact on capital costs, since most sites will need large reservoir capacity now, whereas previously reliance on a borehole was a significantly lower-cost option.

#### **Capital costs of new glass**

10.7 The costs of constructing new glass are broadly as detailed below in Table 10.1, assuming glasshouse developments in excess of 2.5 hectare.

**Table 10.1: Typical cost of new glass per hectare (£'000)**

	<b>Edibles sector</b>	<b>Young plant/ ornamentals sector</b>
Glass	300	300
Heating	130	160
Irrigation	60	100
Environmental computer	30	30
CO <sub>2</sub> system	30	-
Lighting	n/a	150
Benching	n/a	300
Screens (overhead)	n/a	60
Screens (side)	n/a	40
Total	550	1,140

Source: Authors' own estimates based on recent quotes

10.8 In addition to these, there are also groundworks, reservoir construction and offices/staff facilities. It is impossible to give a guide to such items since they are very site-specific.

- 10.9 A typical glasshouse of more than 2 hectares for edibles production would cost around £0.55 million per hectare to establish.
- 10.10 A typical containerised nursery of more than 2 hectares for young plant production would cost around £1.14 million per hectare to establish.

**Table 10.2: Typical cost of new plastic per hectare (£'000)**

	Multi-span polytunnel	Spanish tunnels
Structure	180	35
Heating (warm air)	20	-
Irrigation	20	20
Environmental computer	5	-
Total	225	55

Source: Authors' own estimates

- 10.11 The cost of a higher end multi-span polythene structure production unit is likely to be around £225,000 per hectare, i.e. 50 - 60% that of glass.
- 10.12 The cost of field covers is likely to be around £55,000 per hectare.
- 10.13 The cost of glass for units of less than 1 hectare can rise by up to 50% due to the reduction of area/perimeter ratios, cost of getting crew to site and increased steel sizes. The cost of units significantly greater than 1 hectare can be reduced by up to 20% for the converse reasons.
- 10.14 Second-hand glass is not a normal build method in the WSGA area, where historically virtually all major blocks have been new. Some of the older LSA sites did build second-hand, but this has become rare over the years as the number of these growers has reduced.

### ***Cost of land***

- 10.15 As is normal the price of land varies widely according to availability, proximity to existing sites and demand. Since there is little land available and there are relatively few large local growers looking for large blocks of land, with the remainder being smaller growers considering adjacent plots, the price of land is relatively unpredictable and subject to considerable fluctuation. It should be noted that for any area the actual area that can be utilised is likely to be between 60% and 80% due to edge effects, access etc, depending on the shape of the individual land parcel.

**Table 10.3: Typical land costs (£/hectare)**

Agricultural land sold to agriculture (premium quality land)	£25,000
Agricultural land sold outside agriculture (pony paddocks etc). (Value varies widely according to location and to the effect on the value of residential property, if any)	£25,000 - £60,000
Agricultural land sold to glasshouse industry for new glass and/or packhouse (Value varies widely: higher figure if adjacent to existing glasshouses)	£40,000 - £100,000
Existing glasshouse sites (excluding value of glass) sold to horticulture (Value varies widely: higher figure if adjacent)	£60,000 - £200,000
Glasshouse land sold for housing or other development. Wide range according to type of development	£1 - £2 million

Source: Local land agents / growers

- 10.16 Higher (though as yet unrealised) prices than this have been quoted for land in the area with planning consent for glasshouse development but such prices are doubtfully economic for this purpose and may be concerned more with boosting asset values.
- 10.17 Glasshouse land with 'hope' value (i.e. for residential development), by definition, is not normally sold for glasshouse development. However, some property developers provide 'option values' by paying up to £100,000 per hectare as a one-off payment to secure the purchase at full value, if and when planning permission is granted. It can be seen from the above that where horticulture is competing against non-agricultural land uses for agricultural land there can potentially be a severe increase in the required investment levels. The cost of land is a relatively greater proportion of the overall costs of developing a new nursery in the WSGA area than elsewhere in the UK, and will be typically be 10 - 20% of the total cost, compared to around 5 - 10% elsewhere.

### ***Financing***

- 10.18 The most common form of finance in the industry is through business banking services/private investors, with additional funds being raised for certain proposals through the Agricultural Mortgage Corporation (part of Lloyds TSB). More recently there has been some use of Dutch banks (for example, the Thanet Earth project). This is partly because of a few Dutch growers investing in the UK, and partly as they generally have had lower interest rates and a greater understanding of horticultural operations. Additional sources of finance into the industry are listed below:

- third-party funding for energy developments. There was a large cash injection to the industry whereby CHP providers paid to install the equipment plus other items (for example alterations to heating systems, new boilers) as part of the overall package. This is also a common feature in the Continental industry, and may become so in the UK (see Chapter 8 Energy);
- sale of development land. This is always a major source of funding for agriculture and horticulture;
- joint ventures. These occur occasionally in the UK, whereby other industrial partners see the industry as a useful partner for either fully- or partly-funded new glass projects. An example of this was the British Sugar site at Wissington, Norfolk, where approximately 5 hectares of new glass was built to utilise waste heat from the sugar beet factory. Other examples have included the Drax site to utilise waste heat from the power station. There are various schemes that have been JVs on continental Europe;
- grant support. There has been little support for new glass in the UK for around 20 years, although there is some limited potential under the Producer Organisation (PO) scheme. Within the UK there has been a limited amount of support under the Regional Assistance programme, for example in Cornwall and interestingly for Thanet Earth which received 40 - 50% Regional Grant support from the Government/EU due to the high levels of unemployment since the demise of the coal mining industry.

10.19 The Thanet Earth project, based in the Birchington (Kent) area, includes some centralised energy plant and packing facilities, and has been undertaken under the auspices of the Fresca Group.

10.20 The £80 million project to develop the 91-hectare site is expected to create more than 550 jobs. A consortium of seven specialist large-scale producers of tomatoes, peppers and cucumbers from Holland is sought for the project but currently only three are in operation.

10.21 The project has enjoyed considerable support from local authorities in its facilitation and planning as well as grant aid. The Dutch consortium will no doubt benefit from EU aid as a Producer Organisation and it is reported that this could be based, as a pan-European project, on a figure of 5.1% of turnover rather than the normal 4.1% paid for eligible expenditure through POs.

10.22 Thanet Earth is also recognised as an Assisted Area in the UK where financial assistance under the Selective Finance for Investment in England scheme (SFIE) is available. SFIE grants are available across the whole district to both large corporations and small and medium-sized enterprises (SMEs). Grants are paid to new and existing businesses looking to

invest in capital equipment, expand and modernise facilities, increase productivity and safeguard and create skilled jobs. Projects can involve capital expenditure on fixed assets such as land or property and plant or machinery.

- 10.23 The project proposals involve an export potential of 35MW electricity but it is expected that individual business holders on the site will run their own CHP operations to meet all heating requirements, and will trade their energy independently, using the Thanet Energy Interconnector. There is no central energy centre and the largest single gas engine would be 3MW.
- 10.24 In contrast, British Sugar has a 75MW high performance combined cycle gas turbine CHP which runs the sugar factory at Wissington as well as heating 11 hectares of tomatoes and providing carbon dioxide for glasshouse enrichment.

## 11. Dereliction issues

### **Key Points**

- *Glasshouse design is continuously evolving, and this leads to limited economic lifespan of the houses*
- *Older houses can be used for other lower value crops*
- *Very old houses (typically more than 35 years old) tend to become uneconomic for any cropping*
- *Historically glasshouses tended to be demolished and replaced, often by integrating them with other smaller blocks into a larger area*
- *'Orphan' blocks where this is not possible due to a lack of additional area pose the greatest risk for dereliction*
- *At present dereliction is not a serious issue in the WSGA area and tends to be associated with small sites, especially former LSA ones*
- *In planning terms, the issues of dereliction concern unsightliness, reduction in amenity values and potential dangers to other residents. These are insignificant within the WSGA area*
- *Costs of cleaning up derelict glasshouse sites range are typically likely to be around £25,000 per hectare for the structures, plus £10,000 per hectare for other works if the site is reverting to bare agricultural land or being developed for housing*
- *As sites become larger the potential for larger dereliction issues may arise*

### ***Nature of the problem***

- 11.1 The glasshouse construction industry is one of the most innovative in the whole of building design. Technological changes are almost continuous, and have the twin primary goals of increasing light transmission and reducing thermal losses. This results in structures that have larger sheets of glass, less superstructure, and are integrated with internal systems such as energy-saving screens. Because of these changes, structures become technically obsolete and uneconomic. Labour saving and automation generally involve larger greenhouses with a more regular design.

### ***Scale of the problem***

- 11.2 Derelict old glass is a relatively small problem in the WSGA area, where old glass has historically been replaced with new. The glass that is derelict tends to be in smaller blocks that have not been economic to replace and in particular the units that were the 'justification' for tied agricultural dwellings but are no longer occupied by agricultural workers. This is especially true of the old LSA areas at Almodington and, to a lesser extent, Sidlesham where the plots have been amalgamated.

### ***Considerations for the re-development of redundant glass***

- 11.3 In general terms older glasshouses are used for lower input crops, which tend also to be lower value ones. A typical example would be a glasshouse originally constructed for tomatoes then being used for cut flowers or bedding plants, then finally for crops such as runner beans or strawberries.
- 11.4 It should be noted that costs of maintaining older glasshouses gradually rise to a point where it is no longer possible to economically provide for them, and the economic life of a glasshouse would typically be 20 – 25 years. Once the cost rises to an uneconomic level the cycle of dereliction sets in, as the grower cannot make sufficient return to maintain the unit, then ceases trading and the greenhouse becomes either a liability or a land-bank 'hope'.
- 11.5 In practical terms, wooden houses are no longer viable for any commercial cropping (although they may still be used for garden centres where they may be deemed 'quaint') as the maintenance of such structures is now prohibitively costly.
- 11.6 Older metal houses are now nearing the end of their economic life, with the glazing bead having lost elasticity and severe corrosion occurring on many stanchion heads. It is likely that such houses will continue to be used for another 10 years, although without major investment (for example re-glazing, replacement of stanchion heads and bolts, motors and rack and pinions for vents), the operational costs will increase (poor energy efficiency) and output will decrease (poor quality due to leaking roof and poor vent controls). Older widespan houses

are still more popular with growers due to the large clear area, and the fact that they were generally better constructed. Some growers have refurbished these, replacing stanchion bases and headstocks, and stripping off and re-glazing the roof.

- 11.7 Some organic cropping techniques have lent themselves to production in older houses as they are almost by definition lower input systems. Other uses for older houses include some specialist plant breeding work, although this is limited. There are also instances where an older site has seemed near to the end of its commercial life, but the grower has then found a niche market, particularly specialist pot plants, and subsequently rebuilt glass and expanded.

***Considerations for redeveloping old sites with new glass***

- 11.8 There are two possibilities for such redevelopment: first to continue as a stand-alone unit of similar size and second, to incorporate into a larger unit.

*Suitability for redevelopment as a stand-alone unit*

- 11.9 Change of cropping or expansion within the adjoining area tend to be the two critical re-development options.

- 11.10 Change of cropping can allow a smaller unit to remain economically viable, and can be achieved by the following means:

- conversion to a retail outlet, typically garden centre type. This has happened to several units in the area, notably in Sidlesham and Runcton;
- conversion to higher value crops. A good example would be changing from tomatoes to young plant production. This has been done by several growers in the area who now contract grow for larger nurseries;
- increase in production by use of new technology. The use of container benching and artificial lights can boost production from smaller units very dramatically, and this was employed in some of the Guernsey glasshouses for rose production, and allowed them to remain viable for several years beyond their competitors.

- 11.11 With expansion, the main deciding factor is likely to be the overall size of the unit, including the original and the potential for expanding it. As with potential glass development areas, there will be a requirement for:

- good access sufficient for articulated vehicles of 12m and proximity to the strategic highway network;
- a level site;

- close proximity to a natural gas main and other services (water and electricity in particular);
- a minimum area of around 2 hectares for normal commercial viability at present (useable site area as opposed to area of glass for an individual rebuild project), although this is likely to increase with time (this consensus figure has risen from around 0.4 hectare 20 years ago to around 2 hectares today). This figure could theoretically include any adjacent available agricultural land, since planning policies in both Arun and Chichester Districts specifically support the erection of new glasshouses on adjacent land to existing glasshouses.

*Suitability for redevelopment incorporated into larger unit*

11.12 The main factor will be the proximity to the primary site; thus the order of suitability would be as below:

- land sharing a boundary with the main site;
- land opposite the main site separated by public road;
- land within close proximity, say up to 1000m away.

11.13 Problems with remote sites, even if the physical separation is only a highway, are that costs of services rise (because there are no economies of scale as they require separate boiler houses, water, electrical, gas supplies etc.) and labour control becomes much harder, requiring additional supervisors and transport. As with redevelopment as a stand-alone unit, there will be a requirement for:

- good access sufficient for articulated vehicles of 12m and proximity to the strategic highway network;
- a level site;
- close proximity to a natural gas main and other services (water and electricity in particular);
- a minimum area of around 1 hectare for remote sites (useable site area). There would be no likely minimum area if the land is adjoining.

***Costs of clearing glass***

11.14 The UK has many regions where previous glasshouse areas have been reclaimed as agricultural land. Guernsey, for example, has a good record of achieving this, with large areas of derelict glass now cleared and returned to open fields. This has been encouraged particularly by the important role of tourism in the island's economy and the subsequent

incentive to maintain an attractive rural landscape on a relatively small island, rather than through widespread legal agreements or planning conditions.

11.15 There will be a wide range of figures for the cost of clearing glass, depending on:

- type of structure;
- condition; and
- whether it is professionally removed or sold standing to another grower, who dismantles it and re-erects it himself.

11.16 Typical costs are shown in Table 11.1 below:

**Table 11.1: Typical costs for clearing glass (£/hectare)**

Type of glass	Contractor	Grower
Wooden	12,500	Not suitable for re-erection
22' (6.7m) type metal	28,000	8,000
Venlo (old) type metal	25,000	7,000
Widespan	35,000	Not suitable

11.17 Contractors' prices will be affected significantly by the value of scrap, the cost of disposal of poor quality houses and the level of glass contamination of soil permitted.

11.18 The above figures are for removing the structure from site. Additional costs will be involved if there is significant contamination of the ground with broken glass (typically from £10,000 to £25,000 per hectare) and if additional landscaping (a wide range from £2,000 to £50,000 per hectare) is required. Costs of this have increased due to the cost of landfill (tax and lack of availability).

11.19 Additional to the clearing of the glass may be the following items, which are likely to be on a per site basis:

- asbestos insulation removal. This will usually be in the boiler house, and typical costs range from £4,000 to £7,000, depending on quantity and condition of building in which the insulation is housed;
- oil tank removal. Tanks have to be cleaned and certified prior to cutting up for disposal, although recent increases in the price of scrap steel, even though they have slipped back, are helping to offset against this. A figure of around £1,000 per large tank for disposal is typical;
- breaking up of concrete paths and roadways. These would typically be broken up and buried on site (depending on material and ground conditions) if the land is reverting to a

field or reused as areas of hardstanding. Costs would range from £1,000 to £5,000 for a typical WSGA site;

- other equipment. Unfortunately as the business becomes less viable then propensity to hoard old equipment rather than dispose of it increases, so many derelict sites resemble junk yards. This has more serious impacts in terms of agro-chemicals where they have been occasions when abandoned sites have included noxious pesticides requiring licensed disposal.

### ***Future issues***

11.20 As the relative size of uneconomic sites increases so the potential dereliction issues may increase. In general the larger sites are less of a problem because they are unlikely to be bought by non-growers. The most likely scenario for dereliction of larger sites is where they have been bought by developers with 'hope' value in anticipation of permission to develop for residential use. This has occurred in Guernsey with two larger sites (each about 4 hectares) now being derelict, and is also a more common occurrence in the Lea Valley.