



National Strategy
for sustainable Operational Programmes
within the fruit and vegetable sector
in Sweden

2009-2013

2008-11-28

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1. Introduction

Support to Producer Organisations in the fruit and vegetables sector has existed in the EU since 1997. The aid scheme for Producer Organisations (PO's) was introduced in order to reorient the support. At the time, withdrawals and export refunds consumed a major part of the aid to the sector. This arrangement drew heavy criticism, not least the aid for withdrawals, since large quantities of fruit and vegetables were withdrawn from the market and most of these products were destroyed.

The PO aid scheme was created to encourage producers to take greater responsibility for reducing overproduction within the sector. The rules for withdrawals were changed at the same time. One change was that a ceiling for the share of products that could be withdrawn was introduced. Today, in 2008, one can see that the measures had the intended effect, since withdrawals have declined considerably, from 2.4 million tonnes in 1994/95 to 0.32 million tonnes in 2004/05.

While the EU's costs for withdrawals and export refunds have declined sharply (export refunds were eliminated on 1 January 2008), aid to Producer Organisations has increased, and is today the major aid scheme in the fruit and vegetable sector. In 2005, this form of support amounted to 558 million euro.

However, the aid scheme has received some criticism. One reason is that the legislation has been perceived as unclear and thus hard to apply. Another line of criticism comes from within the EU administration. The European Court of Auditors in a report criticises the aid scheme on the grounds that it only to a limited extent is used for measures that have a measurable effect.

The reform of the market organisation that was discussed and agreed in 2007 included, among other things, a revision of the legislation on support to Producer Organisations. One focus point for the efforts to change the PO aid scheme was therefore to come to terms with the shortcomings pointed out by the Court of Auditors.

One result is that each Member State shall present a National Strategy for the implementation of the PO scheme. The Strategy shall be based on a description of the current situation in the sector and in Producer Organisations. Strong and weak points shall be identified, and the strategy shall then be related to these. In other words, the strategy shall emphasise what measures need to be supported based on the analysis made.

The National Strategy shall then be the basis, the framework, for the Producer Organisations' work to draw up individual Operational Programmes. These Operational Programmes show the measures that the organisation intends to carry out during the next 3-5 years, with EU support.

2. Legal basis and duration

2.1 Legal basis

Council Regulation (EC) No 1234/2007 laying down specific rules as regards the fruit and vegetable sector allows financial assistance to Producer Organisations within the fruit and vegetable sector. Support can be granted for measures within the framework of the Operational Programmes that the Producer Organisations are to draw up.

According to Article 103 (f) of Regulation (EC) No 1234/2007, Member States shall for this aid scheme lay down national rules and a National Strategy for the Operational Programmes to be drawn up by the Producer Organisations.

According to Article 103 (f) of Regulation (EC) No 1234/2007 and Article 58 of Regulation (EC) No 1580/2007, Member States shall also lay down a National Framework for the environmental measures to be included in the Operational Programmes.

In Sweden, national legislation is laid down in Swedish Regulation SJVFS 2008:32.

2.2 Duration

This National Strategy shall apply during the period 2009-2013.

3. Producer Organisations in Sweden

Sweden is quite an average country in terms of Producer Organisations (PO) in the fruit and vegetables sector. The share sold through Producer Organisations is slightly above the EU average, and the average size of the organisations is also slightly above average. However, Sweden is far behind the southern Member States when it comes to the number of Producer Organisations. Sweden has a modest nine PO's, whereas Spain has more than 600, France 300 and Italy more than 200.

Producer Organisations existed in Sweden also before the EU accession. However, they had to go through a recognition process when the EU aid scheme was introduced in 1997. At the outset, there were eleven recognized Producer Organisations. In the years since then, some have merged and some new ones have been created.

In May 2008, the following Producer Organisations had their headquarters in Sweden. The headquarters are given in parenthesis below.

- Blekinge Grönt (Mörrum)
- Äppelriket Österlen (Kivik)
- Kalmar – Ölands Trädgårdsprodukter (Kalmar)
- Mellansvenska Odlare (Göteborg/Linköping)
- Norrgrönt (Umeå)
- Svenska Odlarlaget (Helsingborg)
- Svenska Grönsaksmästare i Förening (Helsingborg)
- Sydgrönt (Helsingborg)
- Samodlarna (Saltsjö-Boo)

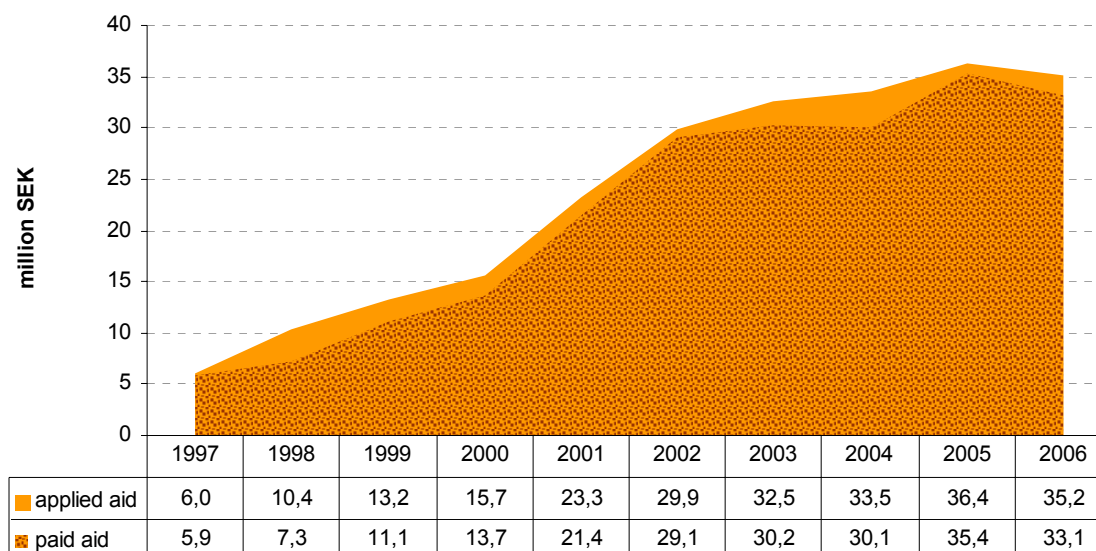


Figure 1. Aid applied for by, and paid to, Swedish Producer Organisations in 1997-2006

Source: Swedish Board of Agriculture

The amounts of support paid to Producer Organisations in the Swedish fruit and vegetable sector have increased continuously over the years. Most Swedish Producer Organisations use as much as possible of the available support, i.e. they are fairly close to the ceiling of 4.1 per cent laid down in the legislation.

The share of Swedish production sold through recognized Producer Organisations has been fairly constant during the period 1998-2004, with a share between 40 % and 45 %. However, this average conceals large differences between different products. Most cucumbers, cauliflowers and tomatoes sold in Sweden are sold through recognized Producer Organisations, while the corresponding figure for e.g. strawberries and carrots is just a few per cent.

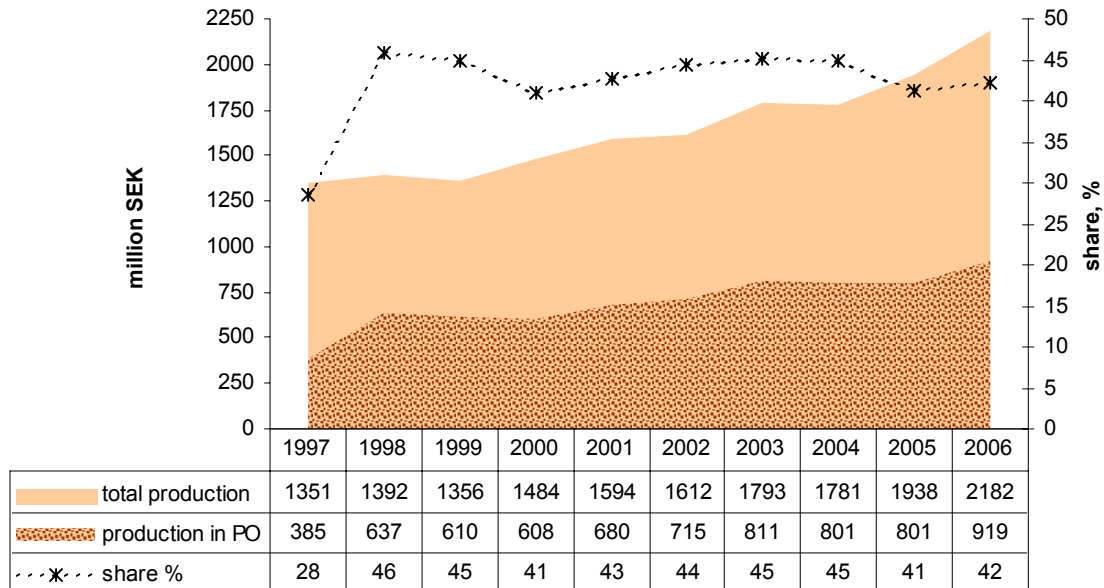


Figure 2. Share of Swedish production sold through POs.

Source: Swedish Board of Agriculture

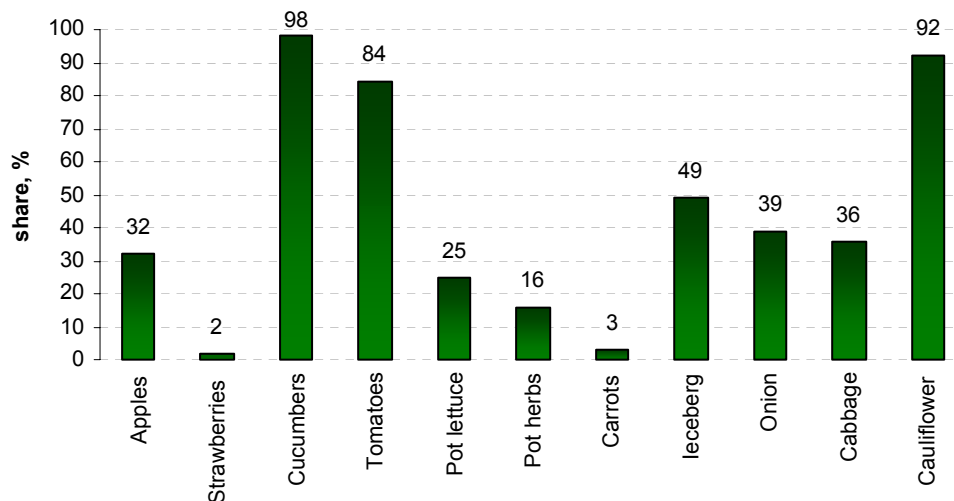


Figure 3. Share of Swedish production sold through recognized POs

Source: Swedish Board of Agriculture

The Commission's target is that 60 % of all fruit and vegetables sold in the EU shall be sold through recognized PO's. In 2005, the share in EU-25 was 33.5 %.

Even though Sweden does not reach the 60 % target level, the share of products sold through Producer Organisations is above the EU average; some 45 per cent of the value of production

in Sweden go through recognized PO's. The average size of Swedish Producer Organisations, based on the value of marketed production, is also above the EU average.

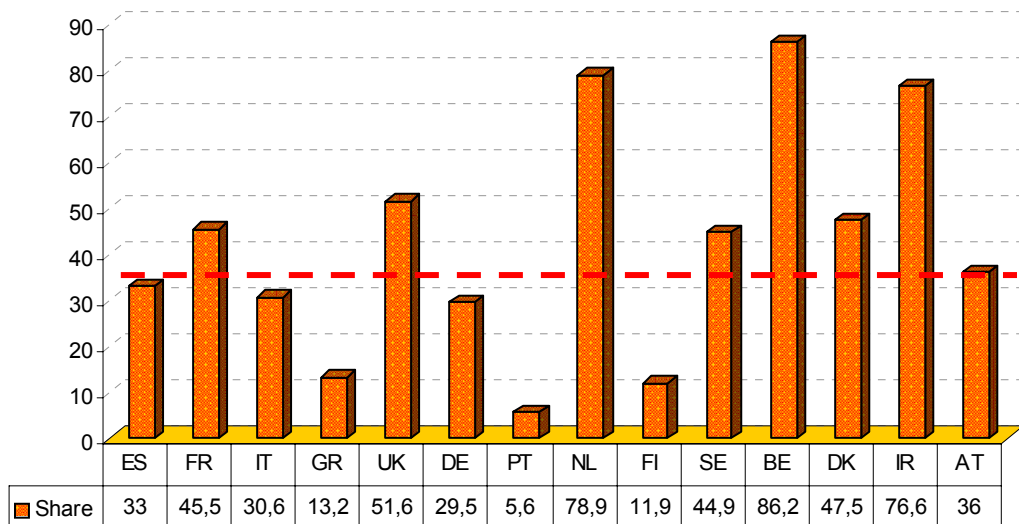


Figure 4. Share of value of production sold through recognized PO's in 2004 (EU average 33.5 %)

Source: EC Commission

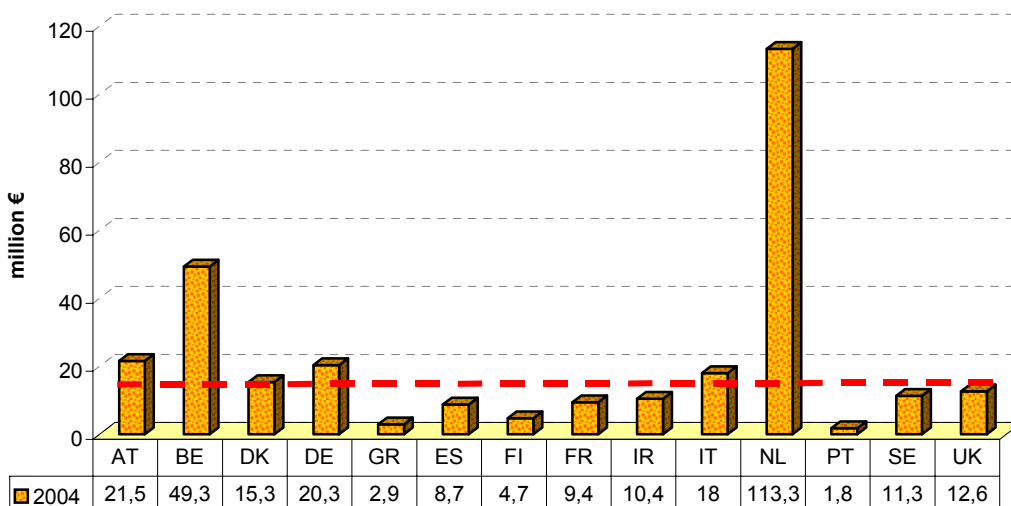


Figure 5. Average sales through recognized PO's in 14 Member States in 2004 (average 10.2 Meuro)

Source: EC Commission

When the support was introduced in Sweden, various types of marketing measures came to dominate the Operational Programmes, perhaps because they did not require a long planning horizon. As other forms of measures have increased, the share of marketing measures has declined, and the distribution over various categories of measures is fairly even today.

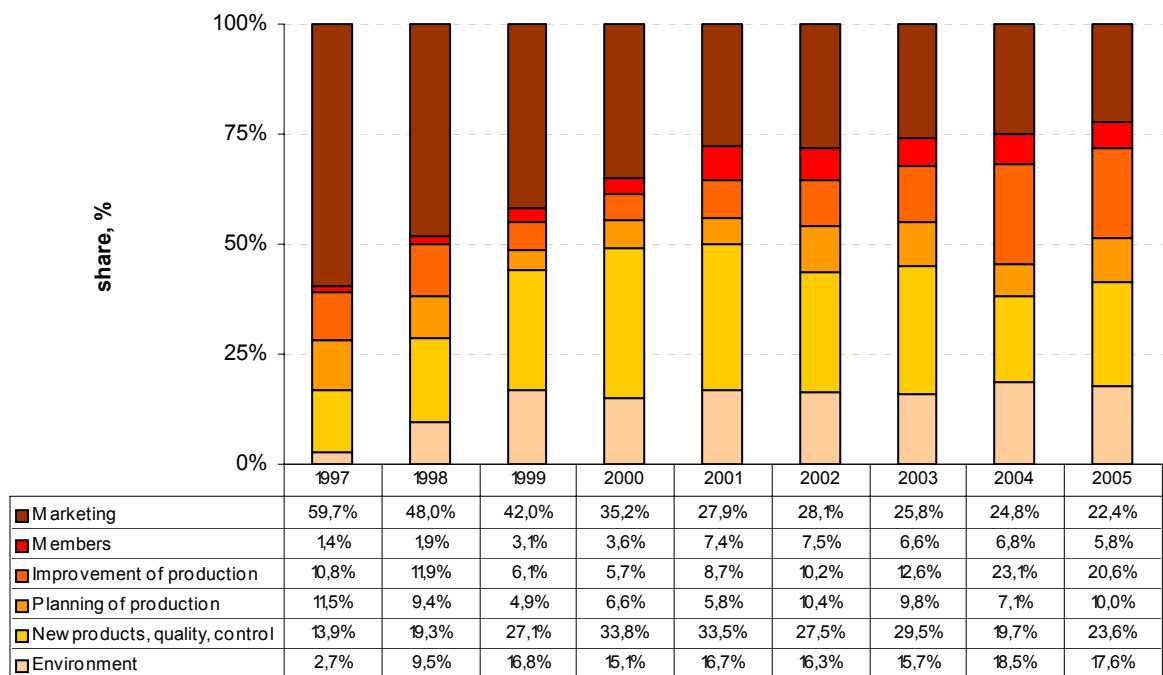


Figure 6. Distribution of Swedish PO support by type of measure between 1997 and 2005

Source: Swedish Board of Agriculture

4. Analysis of the present situation in the Swedish fruit and vegetable sector

Swedish production of fruit, soft fruit and vegetables is dominated by field crops, which represents 42 % of the value of production. Second largest is greenhouse production with 35 %, followed by soft fruit (16 %) and fruits (7 %).

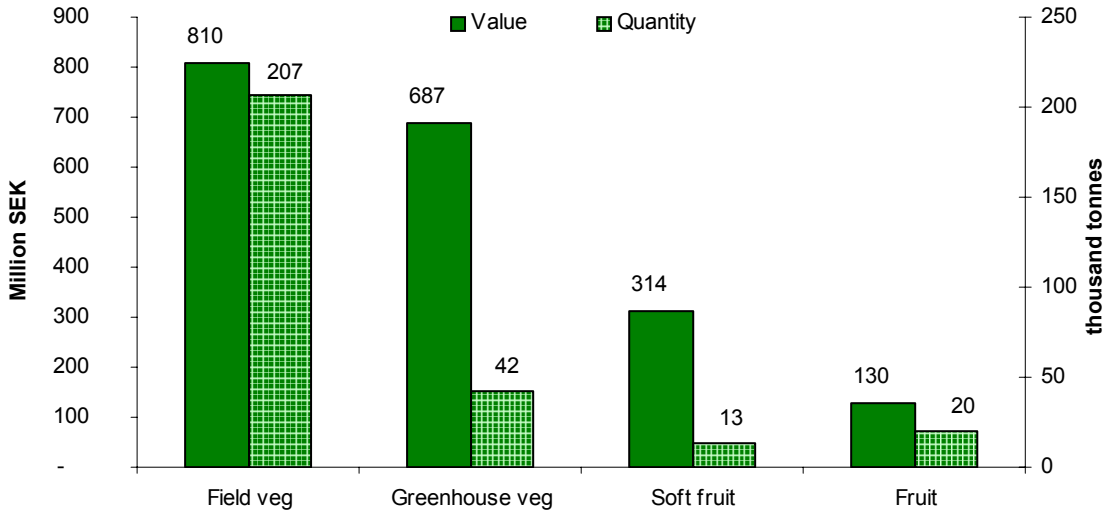
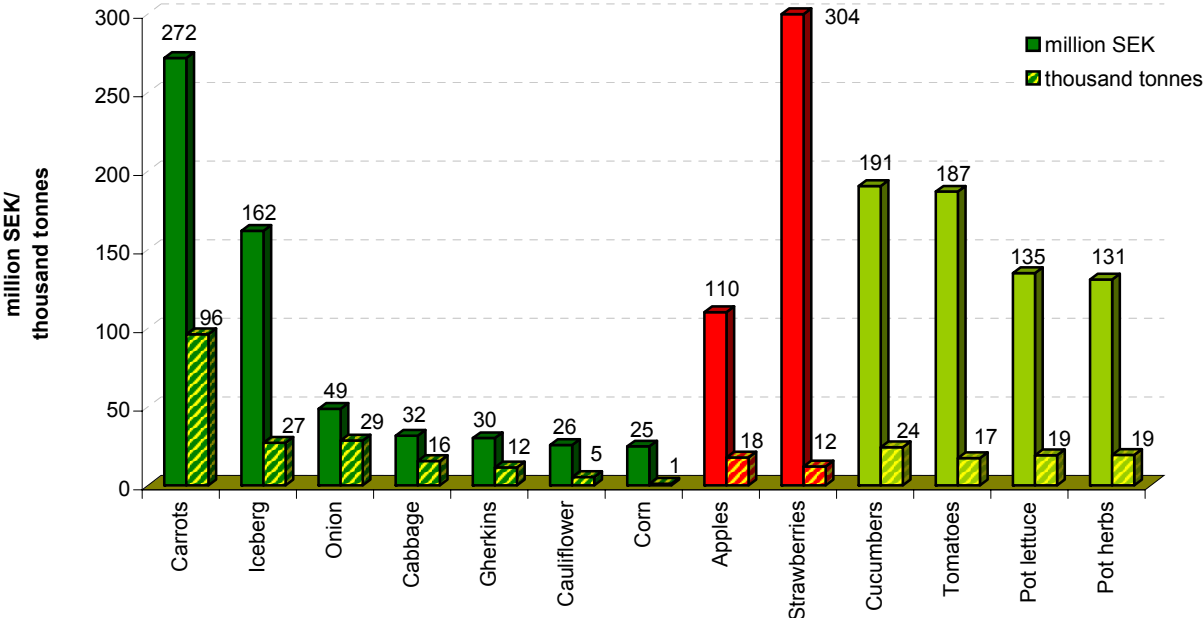


Figure 7. Value and quantity of production of fruit and vegetables in Sweden, 2005

Source: Swedish Board of Agriculture¹



Figur 8. Value and quantity of production for certain fruits and vegetables in Sweden, 2005

Source: Swedish Board of Agriculture

¹ *=Excluding Chinese cabbage, other lettuce and "other vegetables"; **= Only cucumber, tomato, melon and strawberry ***=Excluding "other berries"

As regards individual products, strawberries have the highest value of production, followed by carrots, cucumbers, tomatoes, iceberg lettuce, potted lettuce, spices, and apples.

Geographically, production mostly takes place in southern Sweden. In 2005, 62 % of the vegetable field crop area was located in the provinces of Skåne and Blekinge, as was 71 % of the tomato area, 89 % of the cucumber area, 86 % of the fruit area, and 41 % of the soft fruit area. This means that most production takes place near the distribution centres of the major wholesalers in Malmö and Helsingborg.

4.1. Vegetable field crops

In Sweden, vegetable field crops is the largest subsector within the fruit and vegetable sector, both in terms of value of production and in quantity produced. However, one single product (carrots) makes up 44 % of production within this subsector.

Carrot production amounted to 96 228 tonnes in 2005 (as mentioned, this is 44 % of total production). Since the late 1980s, carrot production has increased every year. Onions and iceberg lettuce each make up 13 % of production in this subsector, and production of these two vegetables has also increased constantly since the 1980s.

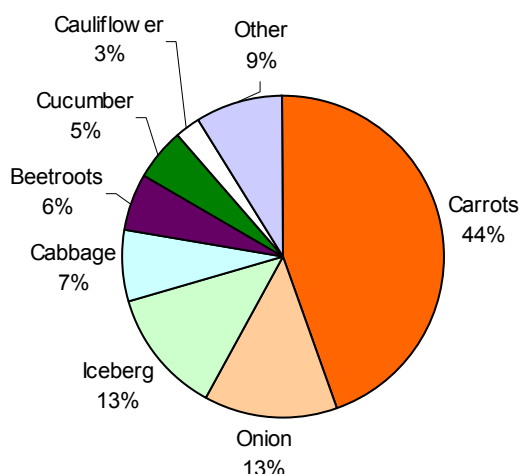


Figure 9. Distribution of production of vegetable field crops, 2005²

Source: Trädgårdsproduktion 2005, Swedish Board of Agriculture

Vegetable field crops comprise some 7 000 hectares. This area has remained largely unchanged in the last 20 years. However, during this period, the number of growers has declined from 2 448 to 987, and the cultivated area per grower has increased from 2.62 hectares to 7.14 hectares. A structural change has thus taken place, in the direction of fewer but larger units of production.

In terms of area, the production of carrots, the most important field crop in 2005, covered some 25 % of the total area. Other products that use large areas are onions, iceberg lettuce, and white cabbage.

² "Other" is comprised by, in falling order, swedes, parsnips, leeks, spinach, broccoli, maize and dill.

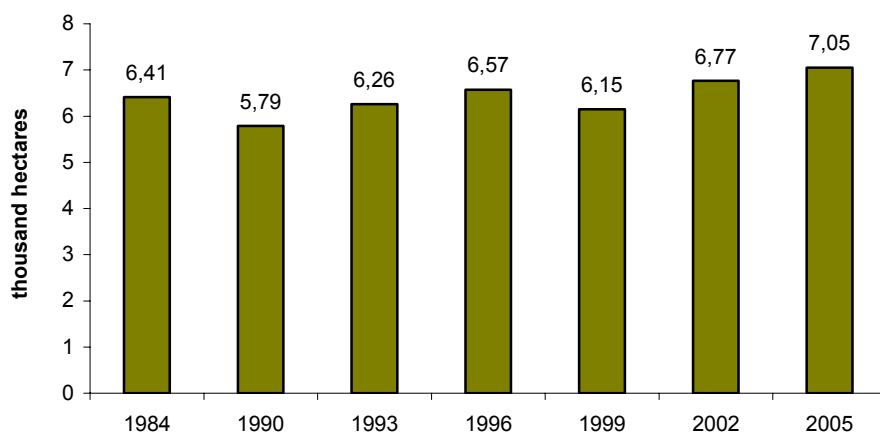


Figure 10. Developments in vegetable field crops, 1984–2005, 1000 ha

Source: Swedish Board of Agriculture

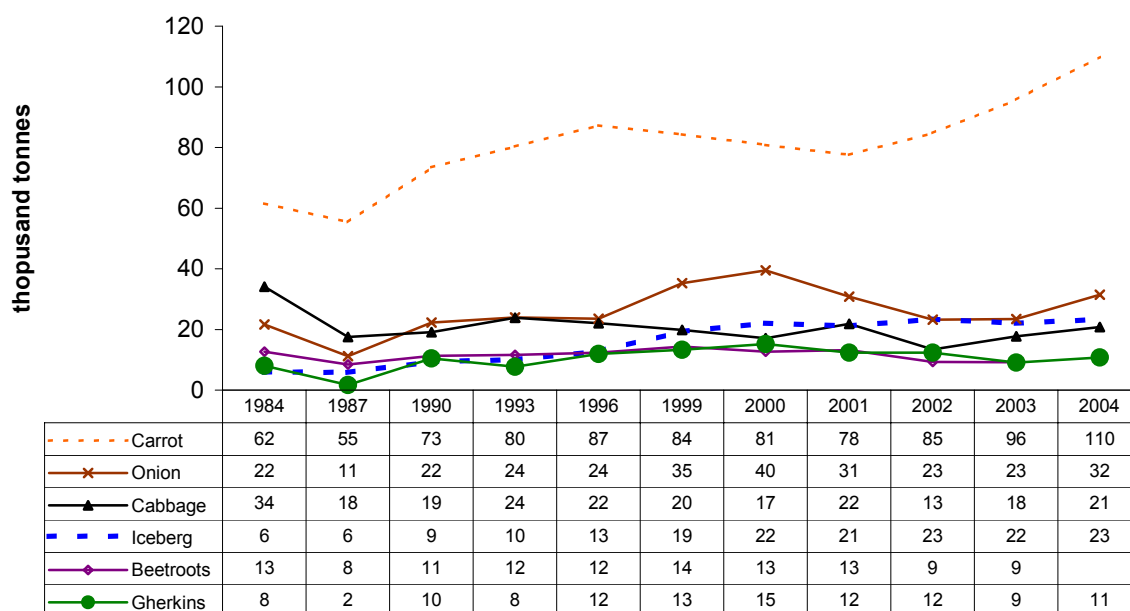


Figure 11. Production of the six largest vegetable field crops, 1984 - 2005, 1000 tonnes³

Source: Swedish Board of Agriculture and the Swedish University of Agricultural Sciences

More than 50 % of the vegetable field crops area is found in southern Sweden. The remaining area is fairly evenly distributed between the central, western and eastern parts of the country. Only 2 % of the vegetable area is in northern Sweden. In the south, the most important field crops are i.a. leek, beet root, cauliflower and iceberg lettuce. Carrots are grown in all of Sweden except in Norrland.

The above figure shows production trends for the six most important vegetable field crops. The figure shows that carrot production has increased by 55 % since 1984. Production of onion and cucumber has increased by 32 % and 44 %, respectively, in the same period of

³ Refers to enterprises with at least 0.25 hectares of field crops.

time. Production of iceberg lettuce increased by as much as 361 %. On the other hand, production of cabbage has declined by some 54 %, and the production of beet root is the same in 2005 as in 1984.

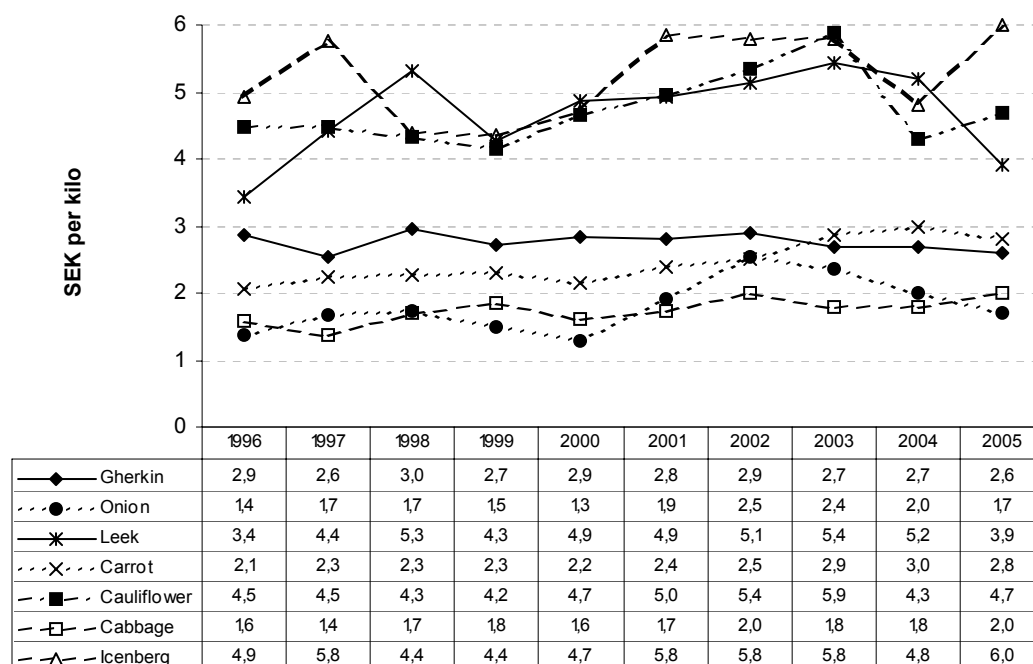


Figure 12. Average producer prices for sale of Swedish field vegetables, 1996-2005, SEK per kg

Source: Swedish Board of Agriculture

In 1980-2006, Swedish prices (adjusted for inflation) of fruit and vegetables on the whole did not increase as much in per cent as the price of food in general. The statistics above (not adjusted for inflation) mostly show differences in price trends between various products. The best price trend refers to carrots, while the price for field cucumbers has not increased at all, in real terms.

4.2 Greenhouse vegetables

Swedish greenhouse production has traditionally been dominated by tomato and cucumber. However, in recent years lettuce (not least potted lettuce) and potted herbs have gained in importance. While production quantities of both tomato and cucumber are stagnating, potted lettuce is developing very strongly. Melon has always been a niche product in Swedish greenhouse production. In recent years, the small production has declined even further. Production is today so small that it is rounded off to zero in the figure.

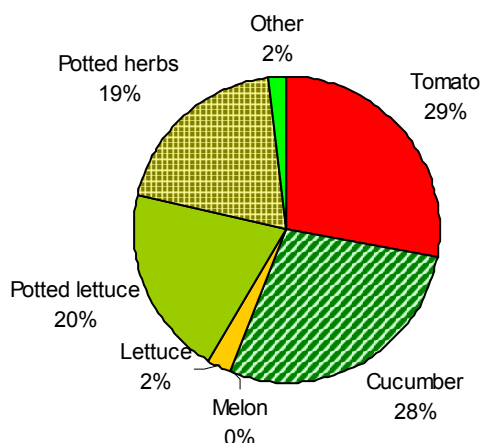


Figure 13. Distribution of value of production of greenhouse vegetables, 2005⁴

Source: Swedish Board of Agriculture

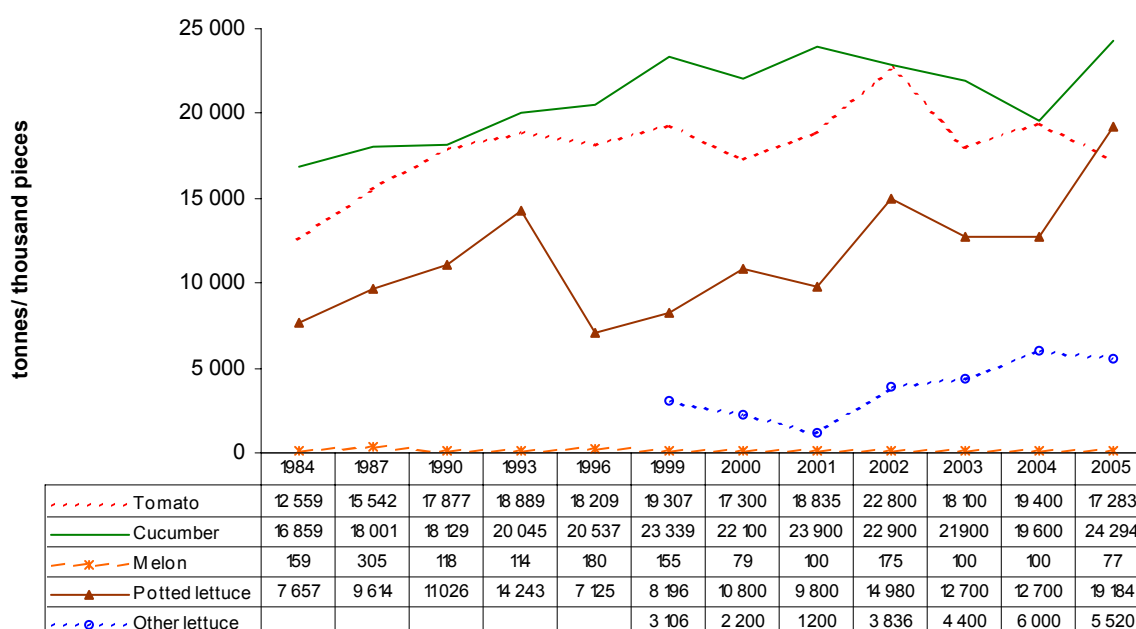


Figure 14. Greenhouse vegetable production, 1984-2005, tonnes⁵

Source: Swedish Board of Agriculture

Like all greenhouse production, tomatoes and cucumbers are mostly grown in the south of Sweden, particularly in the provinces of Skåne and Blekinge. Recent data suggest that the dominance of southern Sweden has become even more pronounced. Greenhouse cultivation of cucumber and tomato often cover larger areas than other greenhouse crops, and more than 60 % of the area is found in companies with more than 5 000 m² of greenhouse area.

⁴ The figure is based on the value of greenhouse vegetable production. The reason for this is that production of herbs, lettuce and potted lettuce is given in the number of plants produced in the statistics available to us. This makes it impossible to compare it to tomatoes and cucumbers, which are given in tonnes.

⁵ Refers to producers with at least 200 m² greenhouse. No data was collected for "other lettuce" before 1997. The product was then included in other vegetables. Tomatoes, cucumbers and melons are given in tonnes, and potted lettuce and other lettuce in 1000 plants.

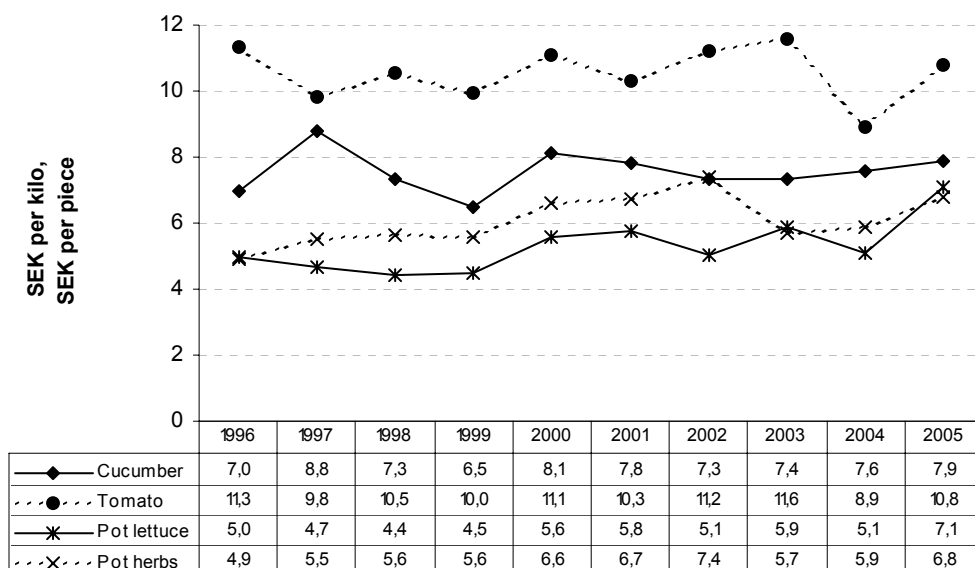


Figure 15. Average producer prices from sales of Swedish greenhouse vegetables, 1996-2005, SEK per kg (tomato and cucumber), and SEK per piece (potted lettuce and herbs)

Source: Swedish Board of Agriculture

The price statistics above show that the “new” products potted lettuce and potted herbs have had a better trend in the last decade than the traditional products cucumber and tomato. It can also be seen that cucumber prices, at least on a yearly basis, are somewhat more stable than tomato prices. The low tomato price in 2004 reflects the situation in all Europe, which from a grower’s perspective was a disastrous year with overproduction and very low prices.

4.3. Production of fruit and soft fruit

Swedish soft fruit production is dominated by strawberries, which in 2005 made up 93 % of total soft fruit production, and 97 % of the value of production. Of the remaining 7 %, blackcurrants made up 4 % (493 tonnes), raspberries 2 % and other berries 1 %.

Strawberry production increased, in spite of certain fluctuations, until the turn of the century. Production in 2005 was however at the same level as five years previously. Production of blackcurrants developed in the opposite direction, and was in 2005 only one fourth of what it had been 20 years before. On the other hand, raspberry production has doubled, but it should be noted that the level is very low, only some 250 tonnes in 2005.

Soft fruit production is more evenly distributed geographically than other horticultural products. Still, most of it is found in the provinces of Skåne, Blekinge and Småland.

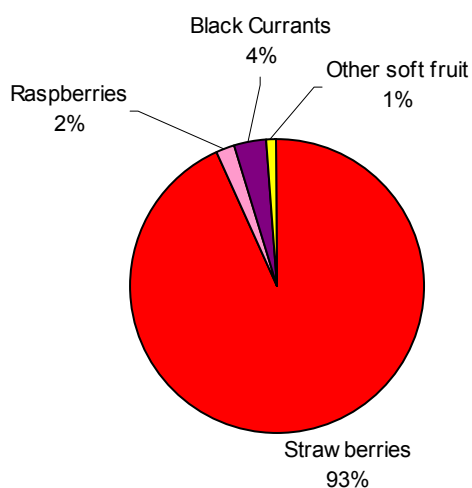


Figure 16. Distribution of the production of soft fruit, 2005⁶

Source: Swedish Board of Agriculture

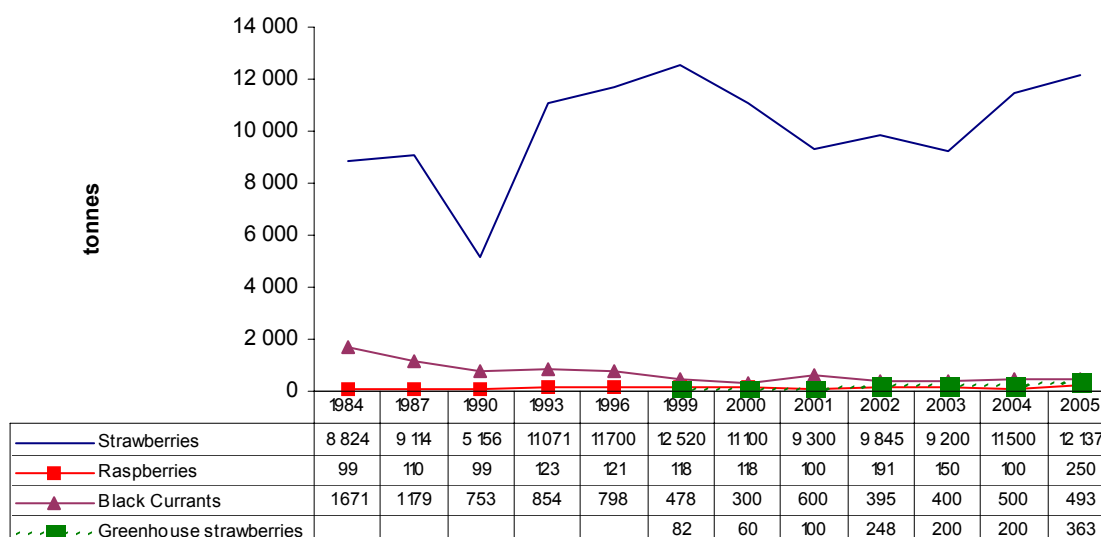


Figure 17. Soft fruit production, 1984-2005, tonnes⁷

Source: Swedish University of Agricultural Sciences and the Swedish Board of Agriculture

Swedish production of apples amounted to 17 683 tonnes in 2005, making up 89 % of total Swedish fruit production. This means that apples dominate fruit production. Other products are pears (8 %), plums (2 %) and cherries (1 %).

⁶ For Other berries, the data on harvested quantity refers to 2002. Other berries include: arctic bramble, highbush blueberry, blueberry, elderberry, sea buckthorn, gooseberry, rosehip, grapes and other berries.

⁷ Refers to enterprises with at least 0.25 hectares of vegetable field crops, or at least 200 m² of greenhouse area.

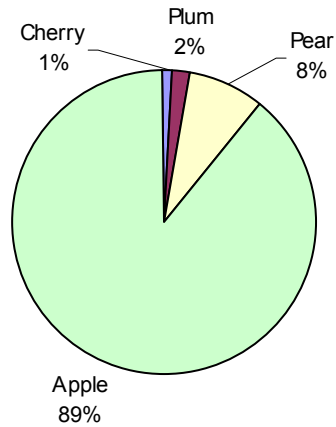


Figure 18. Distribution of fruit production, 2005

Source: Swedish Board of Agriculture

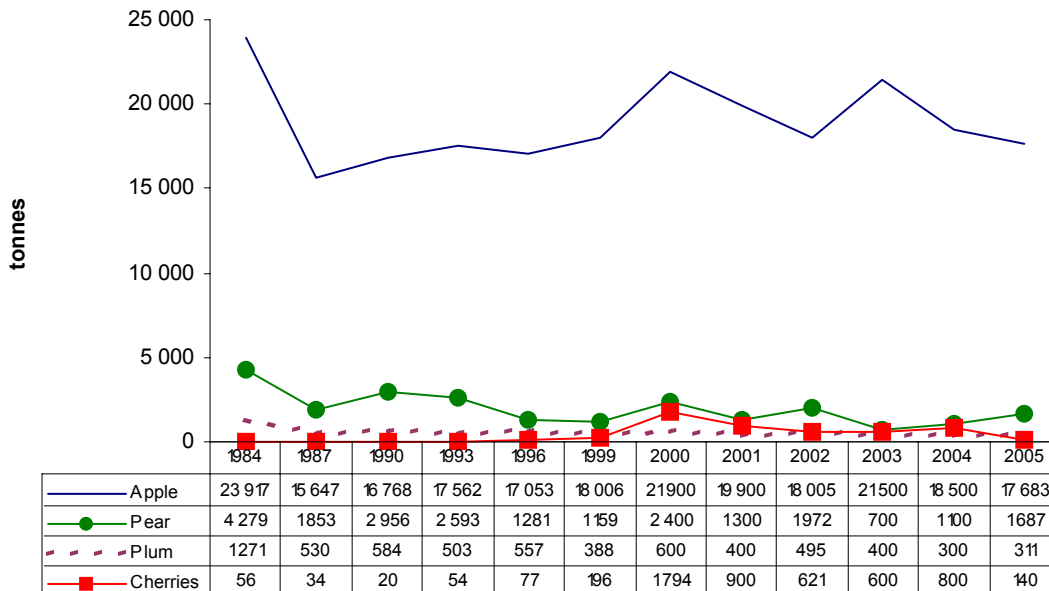


Figure 19. Fruit production, 1984–2005, tonnes⁸

Source: Swedish Board of Agriculture

The quantity of apples harvested in 2005 was similar to that of 20 years before. Taking into account that a certain variation is natural, production has been fairly constant for a long period of time. On the other hand, pear production has declined strongly in the last 20 years. Part of the explanation is that fire blight has infested cultivations, causing substantial problems. Plum production has also declined considerably. Cherry production increased during a brief period, when the future seemed bright. However, this production has been

⁸ Refers to enterprises with at least 0.3 hectares of outdoor fruit production.

strongly affected by competition from countries that acceded the EU in 2004. In recent years cultivations have been grubbed up, which is clearly seen in the statistics.

Most apples, pears and plums are grown in the county of Skåne, and in particular in the Kivik area. On the other hand, almost two thirds of cherry production takes place in the county of Blekinge. However, the stable production figures conceal a structural change. In 2005, fruit was cultivated by 309 growers, which is half as many as 20 years ago. In addition, the area has declined by some 44 % since 1987. However, more intensive forms of production, mostly involving much denser plantings of trees, mean that the quantities produced have not notably declined.

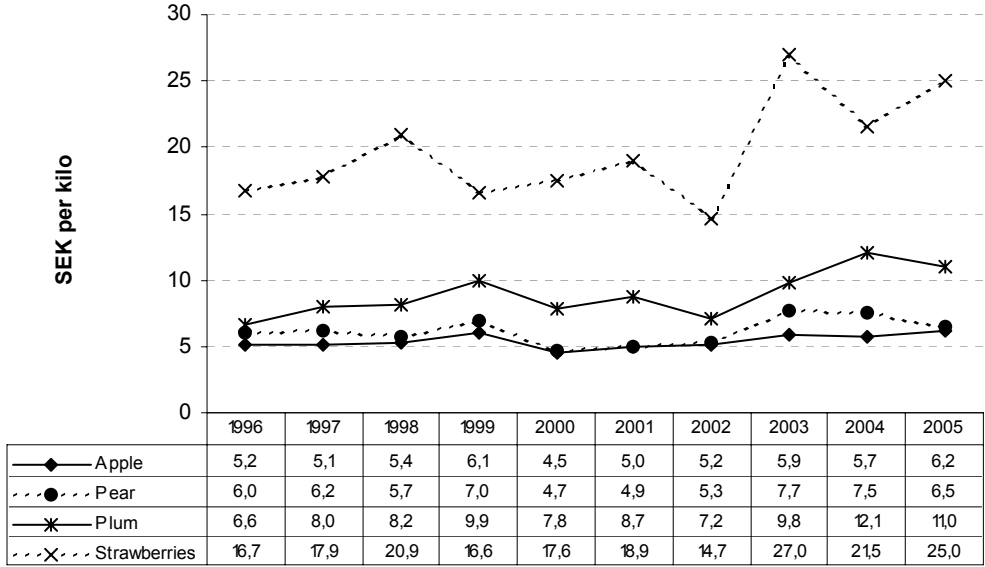


Figure 20. Average producer prices for the sale of Swedish fruit and soft fruit, 1996-2005, SEK/kg

Source: Swedish Board of Agriculture

Price statistics show that the most important fruit or soft fruit product, strawberries, has seen a positive value trend during the period. Above all, a clear increase in prices took place in 2003, and prices remained at a higher level even though they fell back somewhat from the peak year. The price trend for apples has been much more modest, but there is still an increase by 15-20 % between 1996 and 2005.

4.4 Organic production

Organic fruit and vegetables is a sector that in terms of retail sales has grown rapidly in recent years. It is also the sector with the strongest growth of all organic products. Production in Sweden has followed the market trend. However, at the end of the 1990s, production of organic vegetables and strawberries declined, but is now starting to recover. Today, Swedish production of organic products does not meet demand.

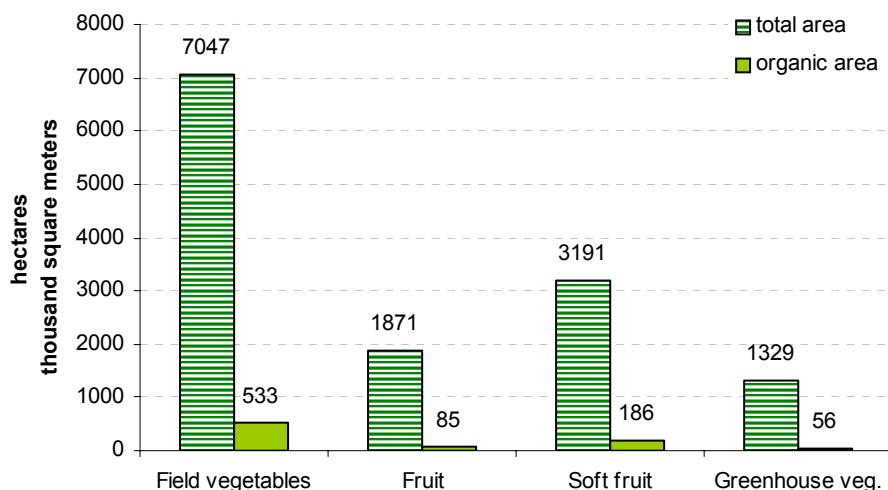


Figure 21. Total area and area certified for organic production 2005, hectares (field vegetables, fruit, soft fruit) and thousand square meters (greenhouse vegetables).

Source: Statistics Sweden/ Swedish Board of Agriculture (*Jordbruksstatistisk årsbok, Trädgårdsundersökningen, 2005*)

The area of certified production (KRAV)⁹ of field vegetables increased in the 1990s until 1996, when it peaked at almost 700 hectares. The area then declined for a few years, by 150 hectares by 1999. In the 21st century, the area has been around 500-600 hectares, with a small increase in 2002-2003 followed by a decline in 2004. Areas have subsequently increased.

In 2007, organic production of field vegetable crops amounted to 611 hectares. This is around 8 % of total production in Sweden.

Organic greenhouse production of tomato, cucumber and herbs has varied in 1997-2007. Tomatoes and potted lettuce are the most important products, and in 2007 the cultivated area for these two products amounted to some 24 000 m² each.

Between 1999 and 2005, however, organically certified production of greenhouse vegetables decreased by 18 %. The decline follows the trend in conventional greenhouse production. In 2005 certified production made up some 3 % of total greenhouse production. This share had remained unchanged since 2002. In all, the figures indicate that organic production follows the trends of conventional production and is influenced by the same factors, for example fuel prices.

In organic fruit production, apple production is the main crop, followed by pears, cherries, and plums. The distribution corresponds to that of conventional fruit production.

⁹ KRAV-certified area does not include EU-certified organic area (which however was very low).

The area certified for organic production is steadily increasing. In 2005 it amounted to 85 hectares which was 5 % of total fruit area. According to the trade there is room for producing more fruit that may be sold as organic.

The main soft fruits grown in Sweden are strawberries, raspberries and blackcurrants. While conventional soft fruit production is dominated by strawberries, black currant production is the largest crop in Swedish organic soft fruit production. Certified areas (KRAV) increased by 85 % between 1999 and 2005 and then made up 6 % of total soft fruit area. The increase is mainly attributable to black currant production while organic strawberry production has declined steadily since the late 1990s.

Prices of organic fruit and vegetables vary considerably from one producer to another depending on their cultivated area, marketing method, costs of packaging and sorting, etc. This must be taken into account when comparing price trends in fruit and vegetables. The price received for fruit and vegetables is much higher for products that are sold directly to retailers or to consumers instead of sold through wholesalers. This applies to all products and thus includes the sale of organic products. No price statistics is available for organic products.

4.5. Degree of self sufficiency

Sweden’s total degree of self-sufficiency in fruit and vegetables is a modest 20 %. However, this average conceals large differences with the highest rate of self-sufficiency found in carrots with 92 %. For several field crops self sufficiency is around 50 %, but the level may be much higher during part of the year.

In other words, an annual average value for the degree of self-sufficiency does not tell the whole story, since there are large differences depending on the month. In addition, many products that cannot be grown in Sweden are included in the average, like bananas and citrus. From a Swedish point of view, it is more interesting to study self-sufficiency during the months when Swedish products are available.

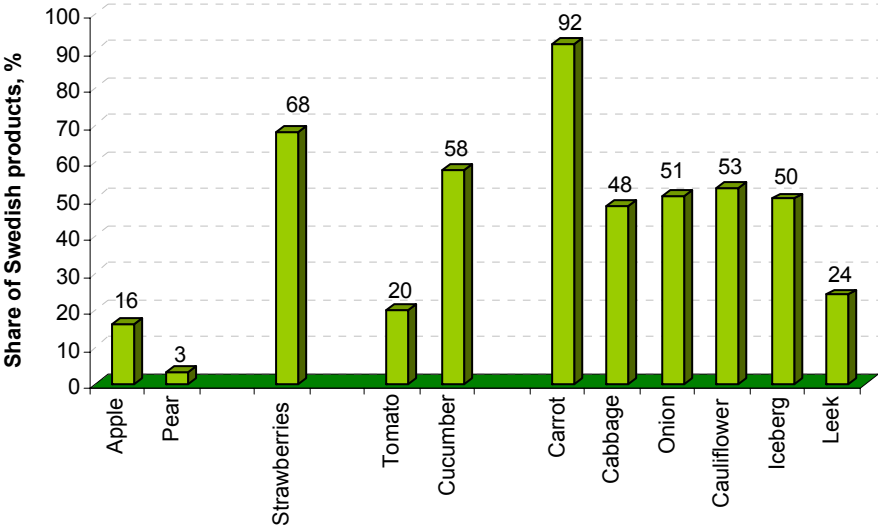


Figure 22. Average degree of self-sufficiency for some important Swedish products, 2003- 2005

Source: Swedish Board of Agriculture

4.5.1 Self-sufficiency – vegetable field crops

The share of Swedish products in total consumption of field vegetables is for several products quite high during the Swedish harvest season. For carrots, which are storable, this share remains high (over 90 %) until February. Then the share of Swedish carrots declines. The explanation may be that the carrots in storage run out, but also that the cold-storage facilities of some companies are not capable of maintaining good quality longer than that. The quality of the cold-storage facilities used often shows up towards the end of the storage season, often because the storage air is too dry (which results in “bearded” carrots) or because the temperature cannot be kept close enough to zero.

Statistics show that with the present level of consumption there is, during the autumn, not much room for placing an increased production of carrots on the Swedish market. This means that what room there is on the market occurs in the spring. This fill segment, however, requires good cooling technology. In addition, it also requires careful harvesting, since the share of damaged products also influences storage quality.

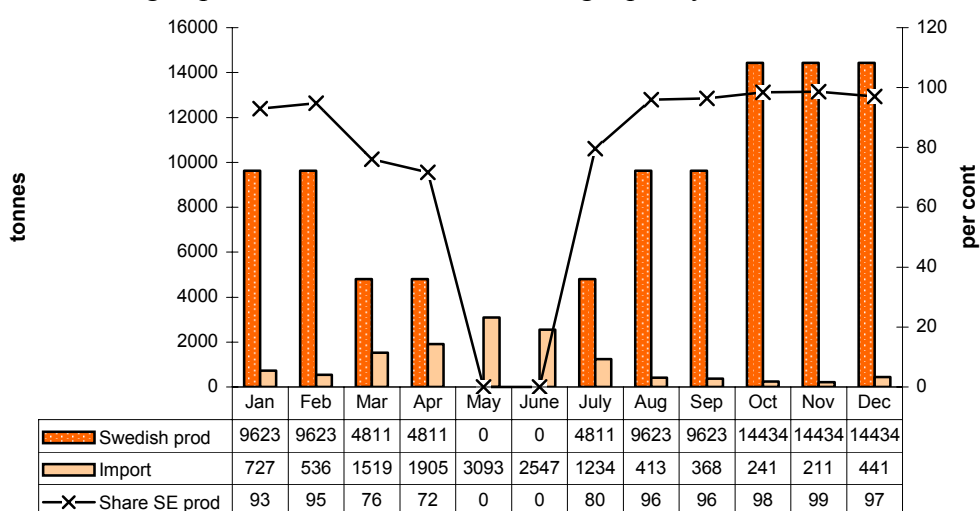


Figure 23. Degree of self-sufficiency in carrots in Sweden, 2005

Source: Swedish Board of Agriculture

As regards lettuce, the share of Swedish products is high in the season when there are Swedish products on the market – more than 90 % from June to September. During this period there is also some limited export to other countries. Since the product cannot be stored, and can only be grown in Sweden during a limited part of the year, there are natural limitations to lettuce production for the Swedish market. In order for any increased production to be sold on the Swedish market, consumption would have to increase.

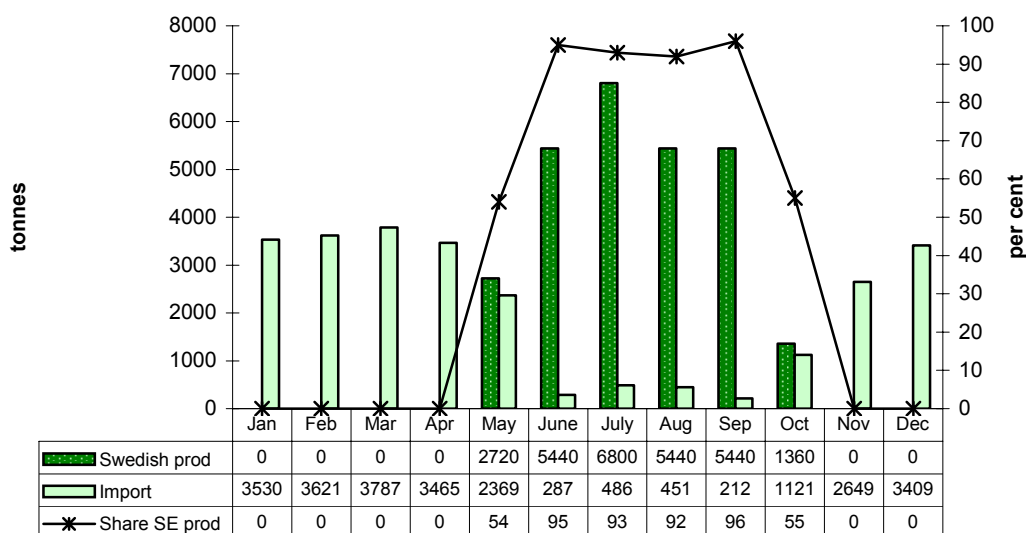


Figure 24. Degree of self-sufficiency in lettuce in Sweden, 2005

Source: Swedish Board of Agriculture

The situation for cauliflower is very similar to that of iceberg lettuce, and the degree of self-sufficiency over the year is about the same for both products, around 50 %. The cauliflower harvest starts somewhat later than that for lettuce, but on the other hand, a larger share of sales is maintained in October. One reason for this is that cauliflower can be stored somewhat longer than lettuce.

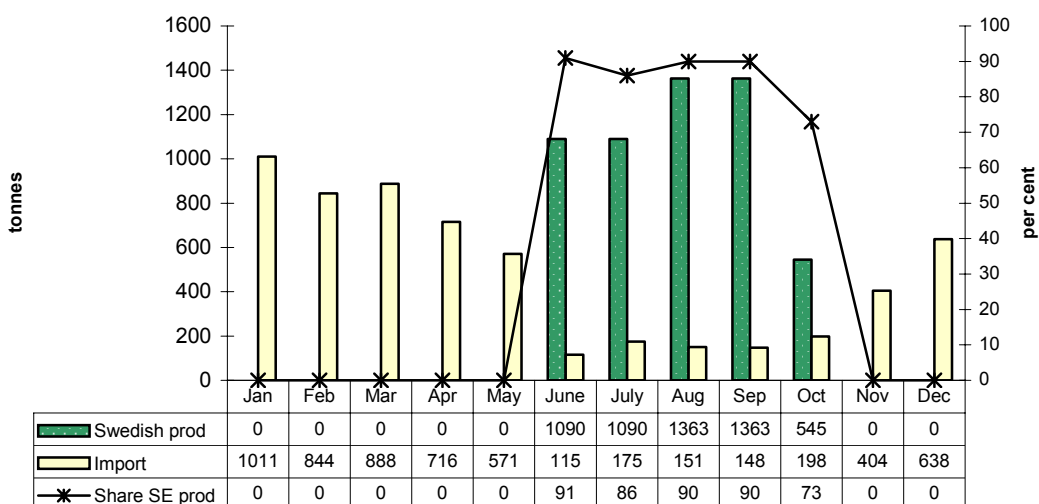


Figure 25. Degree of self-sufficiency in cauliflower in Sweden, 2005

Source: Swedish Board of Agriculture

The degree of self-sufficiency in cabbage over the year is not far below that of cauliflower and lettuce. However, Swedish cabbage does not reach the same market share as those products at any time of the year. Since it is a storable product it can however maintain a market share of more than 30 % until April. However, market share never exceeds some two thirds, so imports always make up at least one third of consumption throughout the year.

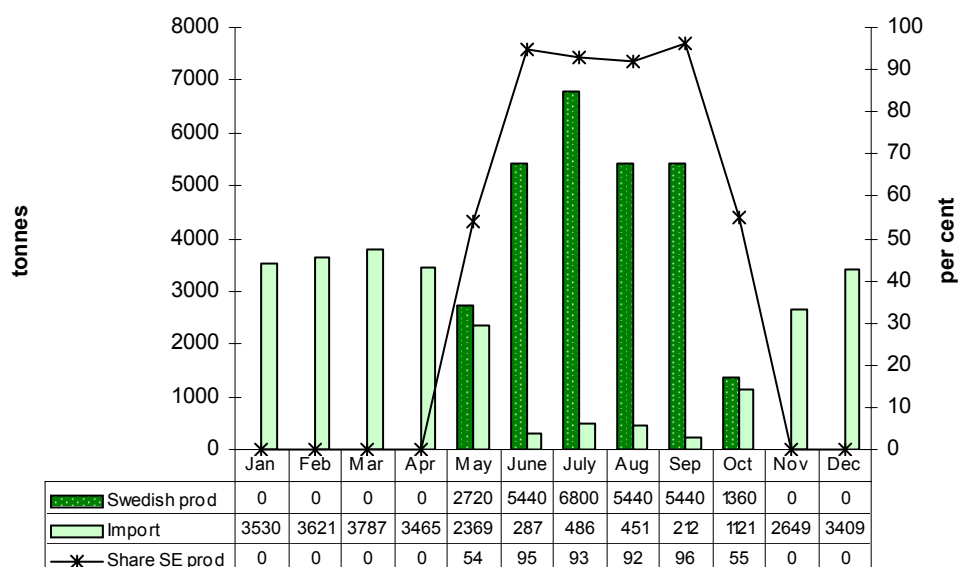


Figure 26. Degree of self-sufficiency in cabbage in Sweden, 2005

Source: Swedish Board of Agriculture

4.5.2 Self-sufficiency – greenhouse vegetables

Tomatoes and cucumbers are the two most important greenhouse vegetables. The harvested quantity of cucumbers is somewhat higher than that of tomato, but this relationship changes from year to year since most growers can switch from the one product to the other. Low tomato prices in one year sometimes results in an increase in cucumber production next year, bringing down the price of this product.

Cucumber production usually starts a little earlier in the year than that of tomatoes. On the other hand, tomato production keeps going a little longer in the autumn. Over a year, the share of Swedish produce is 55-60 % for cucumbers and around 20 % for tomatoes. The distribution per month is similar. The degree of self-sufficiency for cucumbers is over 80 % from April to June, and declines to 60-70 % in the third quarter. The share of Swedish produce in tomato consumption is on the other hand much lower; it reaches no higher than to one third in the summer. For both products, production is almost nil during the three darkest months of the year.

Tomato production thus represents a considerably smaller share of Swedish consumption also during the season when production conditions are most favourable. In part, this may be due to the fact that tomato production is more fragmented than cucumber. Tomato consumption today comprises many types like truss tomatoes, cherry tomatoes, cocktail tomatoes, plum tomatoes, etc. alongside conventional tomatoes. Swedish production has developed cultivation of these new types only to a limited extent. Since Swedish production mostly is aimed for the Swedish market, the figures indicate that if consumption levels remain unchanged for these two products, there is more room to expand production of tomatoes than cucumbers.

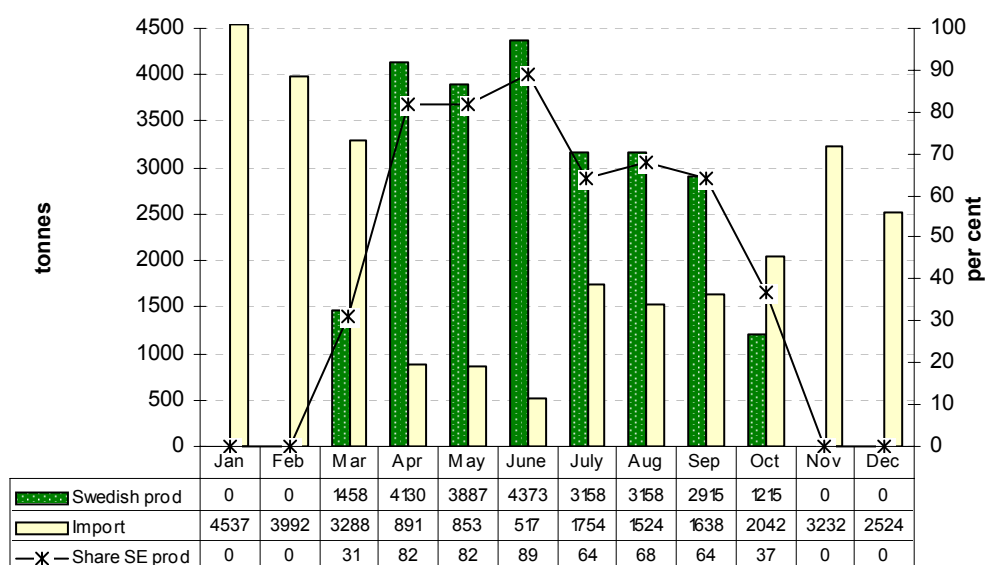


Figure 27. Degree of self-sufficiency in greenhouse cucumber, 2005

Source: Swedish Board of Agriculture

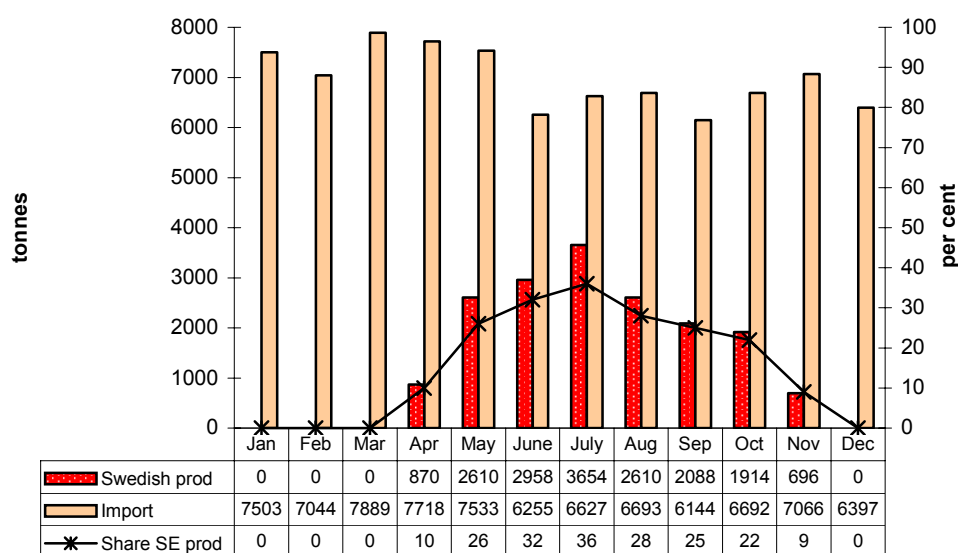


Figure 28. Degree of self-sufficiency in tomato in Sweden, 2005

Source: Swedish Board of Agriculture

4.5.3 Degree of self-sufficiency – fruit and soft fruit

The share of Swedish apples in total consumption is a modest 16 % over the year. This low share is not due to poor storability, since apples can be stored up to a year and could thus be provided during most of the year. However, the maximum storage time is influenced by the variety, and it should also be pointed out that apples that have been stored for a year have a shorter shelf-life and lower quality. There are thus no direct obstacles for a higher market share for Swedish products. Today however, the available supplies of Swedish apples run out some time around January – March.

Swedish strawberries are available mainly in June and July, and to some extent also in August. Consumption faithfully follows the Swedish growing season, and is low in other months. Consumers are also faithful to the Swedish strawberry, which can be seen from the

fact that the market share of Swedish berries is very high in June and July. There is a high consumption peak in the Midsummer week. Years with a cool spring or early summer can make it difficult to meet this peak in demand with supplies of Swedish berries, and imports then have to cover the gap. In such years, the market share can drop a few per cent seen over the year.

Before the EU enlargement, there was much concern that strawberries from Eastern Europe would take considerable market shares from Swedish production. However, such fears have not come true. Today, the salaries have increased in the relevant competitor countries, so the price difference between their products and Swedish strawberries has decreased.

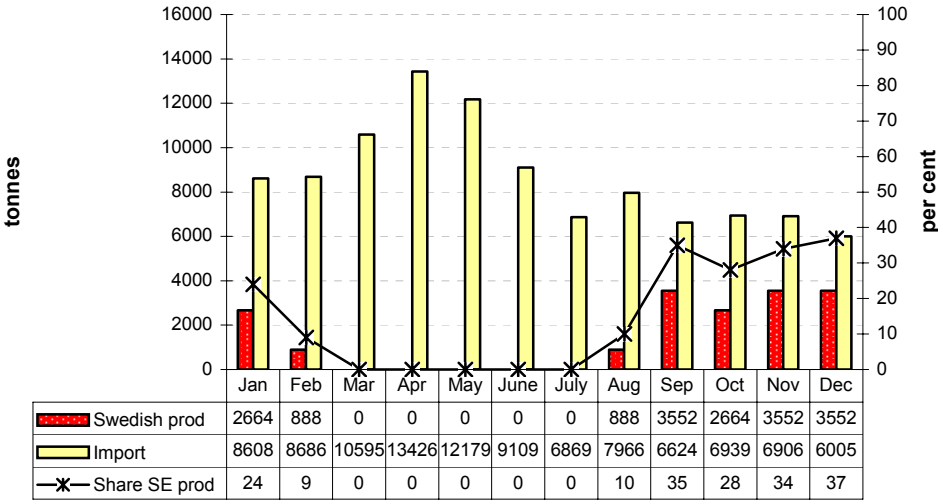


Figure 29. Degree of self-sufficiency in apples in Sweden, 2005

Source: Swedish Board of Agriculture

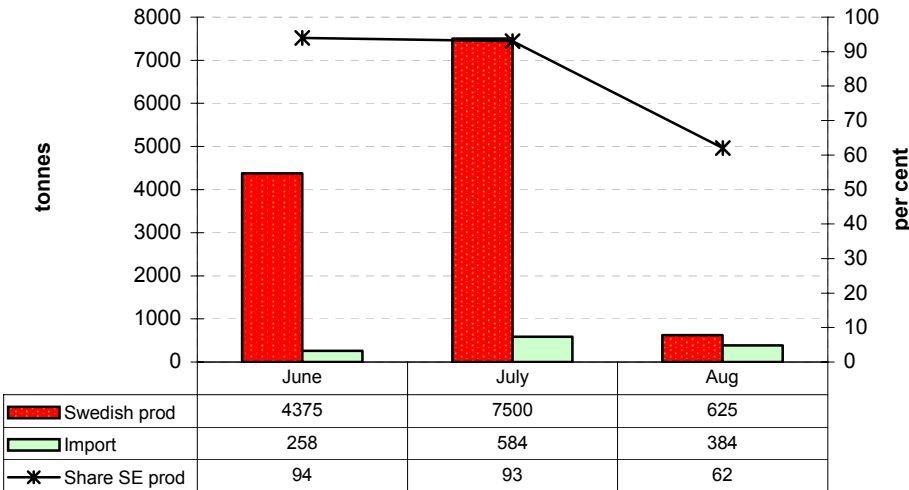


Figure 30. Degree of self-sufficiency in strawberries in Sweden, 2005

Source: Swedish Board of Agriculture

5. Consumption of fruit and vegetables

Consumption of fruit and vegetables varies between the continents. Consumption patterns are fairly similar in North America, Europe and Oceania, with about equal shares of fruit and vegetables and a daily intake between 550 and 650 grams. Asia, whose data is heavily influenced by China, has a large consumption of vegetables compared to fruit, almost three times as high. In Latin America, the situation is the reverse; here fruit consumption is about twice as big as that of vegetables. In Africa, finally, consumption is low of both fruit and vegetables.

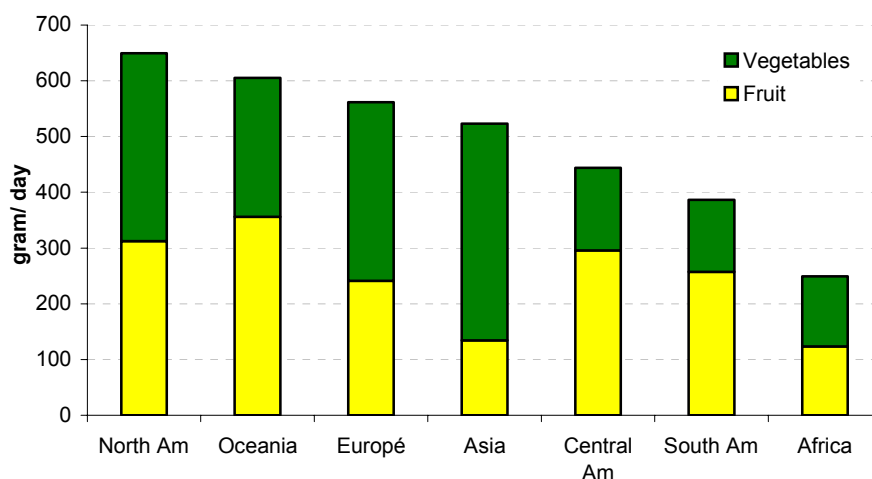


Figure 31. Consumption per capita of fruit and vegetables in various parts of the world, 2003.

Source: FAO

5.1 EU consumption

According to statistics on EU-25 from Freshfel, the Mediterranean countries have the highest consumption of fruit and vegetables, together with Hungary and Belgium. Belgium is high on the list due to a large consumption of vegetables. At the bottom of the list are Estonia, Finland, Ireland, the Netherlands, Sweden, UK and Slovakia, i.e. countries in the northern part of Europe.

Most countries of EU-25 are above the WHO recommendation of at least 400 gram fruit and vegetables per day. The countries in southern Europe are high above this recommendation, whereas ten northern countries, Sweden among them, do not reach the recommended daily intake. A weighed average shows an average consumption in the entire EU-25 of 599 grams per capita per day. This consumption is fairly evenly distributed between fruit and vegetables; the average is 307 grams fruit per day, and 292 grams per day for vegetables.

The geography-based differences are quite obvious when the average consumption of the Member States is compared to the EU-25 average. Fruit and vegetable consumption is high in all Mediterranean states, and they all consume more fruit than vegetables. Fruit consumption varies more than vegetable consumption from country to country. Furthermore, countries with the highest fruit consumption are the ones at the top as regards total fruit and vegetable consumption.

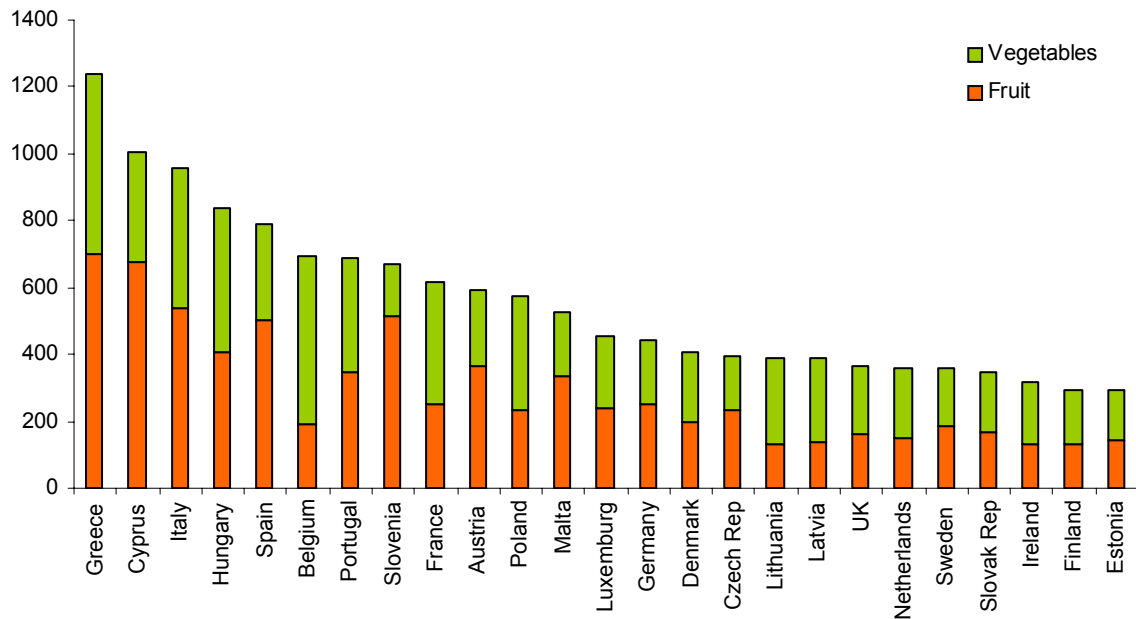


Figure 32. Fruit and vegetable consumption in EU-25 in 2005

Source: Freshfel

Fruit production requires more heat than vegetable production. Therefore it is more concentrated towards southern Europe than vegetable production. It can also be noted that countries with a high fruit production also have a high fruit consumption. Greece, Cyprus, Italy, Slovenia, Spain and Austria are all at the top end when it comes to fruit consumption. Slovenia is the most extreme country from this point of view, with a fruit consumption that is three times as high as its vegetable consumption.

The situation as regards vegetables is similar to that of fruit, but is not as clearly influenced by the north/south divide, since vegetable production is not as strongly concentrated to southern Europe. Vegetable production is more evenly spread in all the EU Member States, and trade is to a larger extent a local matter.

In general, vegetables are more available in all countries, which results in more similar consumption patterns. In addition, there are more low-price options for vegetables, like onions, carrots and cabbage. There is no similar low-price segment in fruits, at least not all year round in the northern countries. Important vegetable producing countries like France, Hungary, Belgium and Poland also have a high consumption. In the northern countries, far from the main fruit producing districts, not least in the Baltic States and in Poland, vegetable consumption is more important than that of fruit, but total consumption of fruit and vegetables is much lower than in the south.

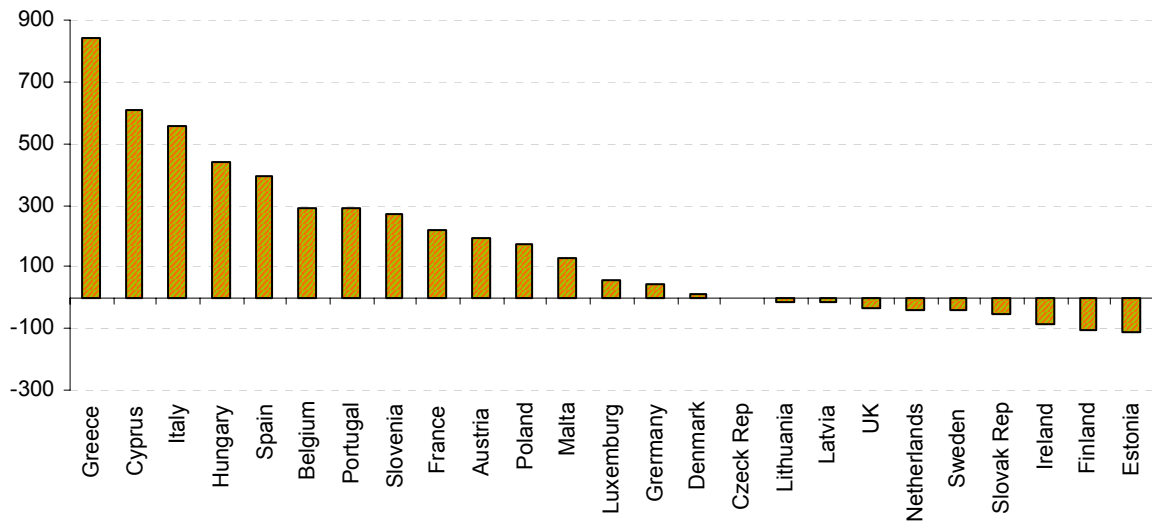


Figure 33. EU-25 fruit and vegetable consumption compared to the WHO recommendation of at least 400 g/day

Source: Freshfel, own calculations

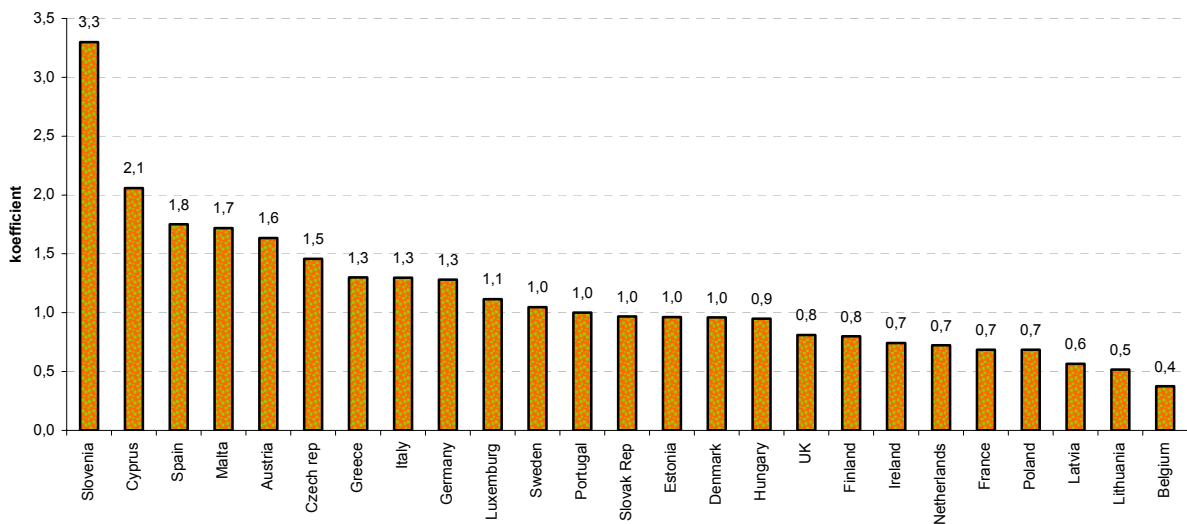


Figure 34. EU-25 relationship between fruit and vegetable consumption. < 1 = more fruit, 1.0 = equal, > 1 = more vegetables

Source: Freshfel, own calculations

On the whole, EU fruit consumption is about as large as that of vegetables. The average EU citizen consumes some 300 grams fruit and 300 grams vegetables per day. In this regard, the Portuguese are the most average, consuming 345 grams each of fruit and vegetables. Consumption is large in the Mediterranean countries and Hungary, while the countries in northern EU has a lower total consumption. In 10 of the 25 Member States comprised by the data, consumption does not reach the WHO recommendation of at least 400 grams fruit and vegetables per day. One of those ten countries is Sweden.

5.2 Consumption in Sweden

The previous section shows that Swedish fruit and vegetable consumption from an international perspective is rather low. It is also below the 400 grams per person and day recommended by the WHO. A comparison with our neighbouring countries shows that the Finnish consumption is even lower, while consumption in Denmark, Norway and Iceland is higher. In the two non-members Norway and Iceland, vegetable consumption is about the same as in Sweden, but fruit consumption is considerably higher. Denmark, like Sweden, has about the same consumption of fruit as of vegetables, but at a level that is about 10 % higher than in Sweden.

Consumption of the major products (in groups) is presented in the figure below. Fruit consumption is dominated by three groups: bananas (consumption of melons is only a small part of the total for this group), citrus and apples/pears. Vegetable consumption is somewhat more evenly distributed.

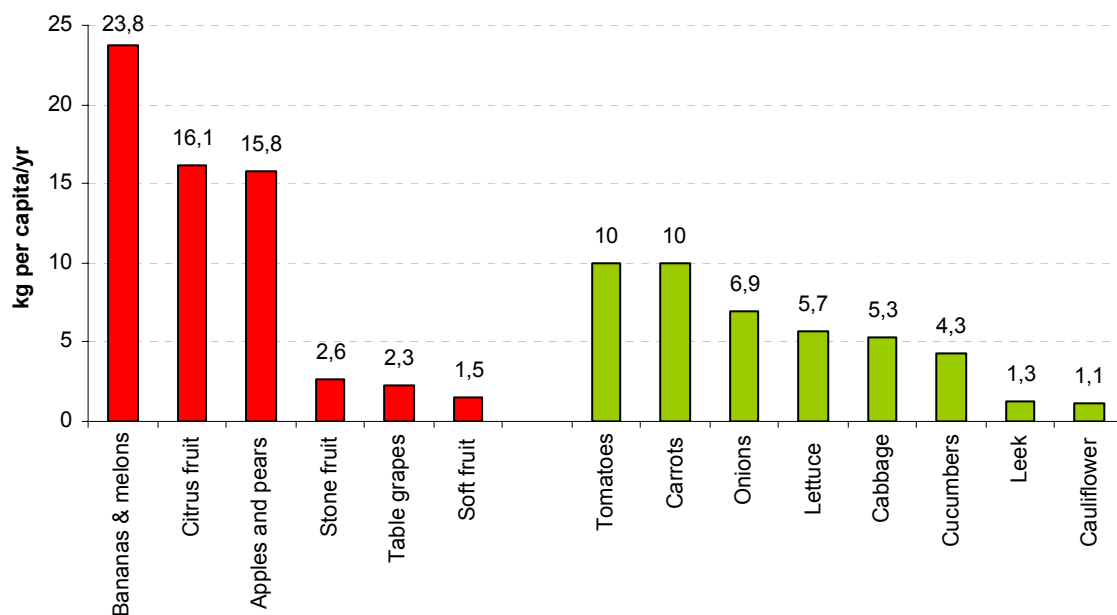


Figure 35. Fruit and vegetable consumption in Sweden, per person and year

Source: Statistics Sweden

6. Important issues in the coming years

In order to address the right questions, an analysis of the strengths and weaknesses of the sector should begin with an analysis of what issues will be important in the coming years. Based on this analysis, it is then possible to estimate to what extent the sector will be able to face the coming demands and challenges.

The Swedish market is very concentrated, dominated as it is by a few wholesale actors. These wholesalers, in turn, have agreements with various retail chains and continuously deliver products to them. A large number of supermarkets need continuous deliveries of the products demanded by the consumers, often with fairly small variations from one week to another, except in the case of highly seasonal products. This structure means that continuity of supply is a basic precondition for anyone who wants to be a supplier to the large wholesalers. A supplier that repeatedly delivers smaller quantities than agreed puts the wholesaler in a difficult situation vis-à-vis the supermarkets, and risks losing this wholesaler as a customer.

A related matter is that the supply chain and the cool chain must work well. This means that the products are to be cooled quickly after harvest, and delivered to the buyer as soon as possible while being kept at the correct temperature at all times. Whenever “the supply chain” is mentioned in this text, this includes a well-functioning cool chain. If the supply chain does not work properly – due to slow deliveries or interruptions in the cool chain – the products lose some of their freshness, shelf life and nutritive content, and more products go to waste. This would also increase the number of retailer complaints to the wholesalers, which can have a clear effect on the financial result. This means that two key words are “continuity” and “the supply chain¹⁰”.

The increased demand for locally grown products has some bearing on the above discussion, even though this demand is also related to aspects of climate and other environmental matters. The demand for locally grown products has increased in recent years, and this trend is expected to continue. Regarding the quality and aging processes of the food, local goods have an advantage in being closer to the final consumer, which means that the product can be consumed within a shorter period after harvest. How much of an advantage this is depends on how sensitive the product is and how quickly it ages, but also on how it is handled. The single most important factor for maintaining quality when food is handled is temperature, since the rate of chemical processes is twice as high when the temperature is increased by ten degrees. This applies also to complicated biochemical processes that are a major factor in the aging of fruit and vegetables.

The aging of fruit and vegetables, and thereby also their degree of freshness when they reach the consumer, thus depend strongly on a combination of time and temperature. Nearness to consumers makes it possible to reduce one of those factors, that is time. However, if the other factor, temperature, is not handled correctly, products that were produced outside the local area may in fact be fresher than the locally produced ones.

Good quality is a basic requirement. It is traditionally connected to exterior characteristics such as colour, shape, freshness and absence of defects and to internal characteristics such as texture, maturity, taste, aroma, and shelf-life. In addition to the traditional definition of quality, other factors are gaining increasing importance. For example, retailers increasingly practice a zero or very low tolerance for pesticide residues. Two other examples are contamination issues and traceability. The latter is reported to work well enough, but a

¹⁰ In Swedish the word “supply logistics” is used which more clearly includes the logistic part of the term.

number of different traceability systems make the practical application a bit unwieldy. A welcome change, it is said, would be to coordinate the traceability systems into one common system for all Sweden. Additional key words are therefore “quality”, “pesticide residues”, “microbiology” and “traceability”.

There are several examples of very successful product development within the sector. Potted lettuce, herbs and babyleaf are some examples of products that have generated considerable added-value compared to traditional production. A continued interest in product development is therefore of vital importance to the sector. This makes “product development” yet another key word.

Environmental and climate issues draw more and more attention, and the wholesalers and retailers expect their customers attach more importance to these matters – even as regards fruits and vegetables – when their everyday lives are affected by floods, storms, and poor holiday weather. How this increased attention is to be dealt with is another matter. In order for consumers to be able to make an active choice, it must be possible to distinguish certain products, and this in turn requires some form of labelling. Another solution would be for the wholesaler to lay down requirements for all products, and not accept products that do not conform. There are thus purely commercial aspects to efforts aimed at minimising climate and environmental effects. “Climate” and “environment” should therefore be added to the list of key words.

Demand for organic fruits and vegetables has increased in recent years, and there is currently a shortage of Swedish organic produce. Many of the organic producers are small and their production is fragmented into a wide range of products, which means that they have limited capacity to increase production in response to increasing demand. It is therefore likely that there is room for large, rational producers who can comply with requirements regarding continuity, the supply chain, quality, microbiology and traceability, and who can convert to organic production partially or in full. “Organic production” is thus a key word for the future.

The value of products can be increased by developing functional consumer packaging that preserves quality and also presents the product in an attractive way. This could also improve both the product’s shelf life and quality. However, this also generates waste, which is an unwanted side-effect. A compromise might be to develop environment-friendly, biodegradable, consumer packaging made from renewable raw materials. Especially for sensitive products with a high degree of waste, new types of packaging may be of motivated both financially and environmentally. Likewise, developing new types of functional transport packaging and trays and other insets may be useful from a quality point of view, but environmental aspects must also be taken into account.

7. Analysis of strengths and weaknesses

7.1 Strengths and weaknesses in the subsector vegetable field crops

The subsector vegetable field crops has good potential in Sweden. Many of the products being cultivated have their origin in similar climates, which means that Swedish conditions suit them well. Yields are comparable to what is achieved in other EU countries, and it is possible to obtain a high quality. The good conditions for this subsector are indicated i.a. by the fact that Sweden has a high degree of self-sufficiency for several products, either during the entire year (carrots) or during the season when Swedish products are available (iceberg lettuce, cauliflower, cabbage).

7.1.1 Production planning, continuity and the supply chain

Scheduling production¹¹ in order to obtain an even and continuous production during the season has been carried out for a long time. Both surpluses and deficits cause problems. Deficits mean that the wholesalers' and retailers' demand for continuous supply cannot be met, and surpluses cause problems of outlet and price. No withdrawals of fruit and vegetables have ever been carried out in Sweden and acute surplus situations are rare. There is some variation in the quantity supplied, however, but this must be considered natural since there is no predicting the changes in the weather.

Naturally, Swedish production is closer to the Swedish market than the competitors, who are mostly in the Netherlands, even though the distance in time shrinks as logistics become more efficient. Imports from Spain are large, but mostly take place when Swedish production is low. The proximity to consumers can be a competitive advantage for products with limited shelf-life like tomatoes and cucumbers, if it is used properly. This means that the supply chain must work optimally (please see the preceding section).

As regards the supply chain, however, there is room for improvement both in pure logistics (delivering the products as quickly as possible) and in cooling and the cool chain. As described above, if the supply chain does not work well, this will have a negative effect on the shelf-life, quality and nutritional value of the products.

7.1.2 Quality, residues, microbiology, traceability

It is the wholesalers' opinion that Swedish production generally yields products of high quality with few quality problems. As for soft-fruit, cultivation in a colder climate stimulates the production of certain antioxidants (flavonoids), which may be significant for the nutritional value of the products. However, more studies are needed before any general claim can be made in this respect.

However, good production conditions and quality do not rule out the need for further improvement in quality, and not least that it could be more even. Quality problems vary a lot from one season to another, as well as during seasons, since dry weather causes very different problems from wet weather. The most common problems are insufficient cleanliness and poor trimming. Stored products sometimes have problems with storage rots, and stored onions

¹¹ Scheduling means to multiply the expected time by the temperature, and use the result as a basis for calculating the time from sowing/planting to harvest, thereby obtaining an even production volume at the desired level.

sometimes sprout. The reasons behind these problems can vary: poor trimming or sorting, poor crop rotation, or maybe just bad weather, something that may be hard to fix.

The quality concept also includes good shelf-life, which is strongly influenced by post-harvest temperatures. Cooling at the time of harvest is sometimes unsatisfactory: ineffective, insufficient¹², or too late. There is thus room for improvement here.

The quality concept also includes contamination issues. Producers must be able to guarantee that the products have not been contaminated by irrigation water or cultivation substrates, and that all requirements related to plant protection have been complied with. Since increasing weight is attached to this issue, both in terms of residues and microbiological aspects, wholesalers and retailers would like to see increased supplier monitoring of these aspects. Efforts to improve the quality of irrigation water are also part of this work.

Traceability work has produced good results in Sweden, and according to our information there are few problems in this area. However, several different systems are used. Some actors have expressed an interest in coordinating the systems.

Consumer packages, trays, or wrapping of individual products may be a way to maintain quality, extend shelf life and reduce waste. It may also create value-added for the product. Reduced organic waste is a good thing from an environmental point of view, but must be weighed against the waste caused by the package/wrapping material and negative environmental effects from this.

7.1.3 Marketing

Marketing efforts carried out are often not very coordinated. This means that their effect is limited. There is also a risk that products from different producer organisations compete with each other in the marketing while the purpose of the EU marketing support is to increase total consumption. It should be noted here that Sweden has an average consumption of 359 grams per day, which is lower than the WHO recommendation of 400 grams.

Marketing often includes measures that could be considered the responsibility of wholesalers and retailers, like exposure and quality at retail level. Such work shall not be eligible for support.

It is true that it is always hard to evaluate the effect of marketing measures, but it still ought to be possible to find better ways of using the means spent on marketing than what has been the case so far. Among other things, there is room for more coordinated campaigns. The tomato subsector (which is not a field crop, however) is a good example of a product for which there have been good, coordinated efforts.

7.1.4 Product development and experimental production

Experimental production is not a focus area in itself, but rather a way of working within a certain area. In other words, it is a tool that can be used within several focus areas, like environment, quality or development of new products. In this strategy, experimental production is tied to each focus area, and is therefore not given much space as a separate area.

Product development is very important, since new products, types and varieties need to be developed and their cultivation in Swedish climate tested and compared to existing products

¹² Ineffective cooling refers to a cooling technique that is too slow, whereas insufficient cooling means that the process was interrupted before the temperature had dropped far enough.

and varieties. In field vegetables, there has in recent years been a strong development in lettuce, which has resulted in several products new to Sweden. Babyleaf and rucicola lettuce are two important new products. In other subsectors, most product development consists of testing new varieties. Product development has been very positive for the sector as a whole.

Product development also involves finding new kinds of consumer packaging in order to extend shelf-life, reduce damages and waste, and thereby increase the market value of the products. This kind of product development is also quite valuable, but needs to be coordinated with environmental efforts.

Product development is believed to be of great importance to the subsector, and the work should continue.

7.1.5 Crisis management

Crises within the sector can be caused by low prices or weather and natural phenomena. As regards weather, the subsector can be hit both by hail damage and by floods. There are currently no quarantine pests but other pathogens can cause serious problems. Price variations should be dealt with by the market. Crises related to the weather, natural phenomena or pathogens¹³ have so far been handled by the sector itself. The new legislation, however, allows support for several different types of crisis management measures.

7.1.6 Environment and climate

The environmental effects of the sector include, among other things, leaching of nutrients, pesticides and herbicides. Besides the risk that such substances may reach the groundwater, they can also have an effect on biodiversity and the balance of ecosystems. One of the most clear examples of this is the eutrophication of lakes and seas.

As regards fertilization, it is common to use more fertilizer than optimal, in order to make sure that lack of nutrients does not limit growth. The cost for this is often seen as a risk premium. The surplus is an environmental pressure, and it should be an objective to change this strategy. Also for pesticide use, there is room for increased use of risk analyses and site-specific strategies.

Some vegetable field crops are sometimes repeatedly grown on the same land. In some cases, a product is grown year after year in the same field, and in other cases there is some crop rotation, but not enough considering the relevant pathogens. This increases the plant protection problem, and thus increases the need to use plant protection products. Since a well-planned crop rotation contributes to increased quality and reduces the need for plant protection, it should be noted that there is the room for improvement in this area. Crop rotation also has an effect on the nutrient balance of the soil, and thereby on the need for fertilizer. Good crop rotation is therefore important in this way as well.

Packaging, both transport packaging (boxes, crates and cartons) as well as consumer packaging, generates large quantities of waste. The ambition should be to use circulating crates as much as possible. As regards consumer packaging, “conventional” (petroleum-based) plastics are mainly used today. In this case, the aim should be to switch to packaging made from renewable raw materials. The same applies to trays and other insets in transport packaging.

¹³ The term “pathogen” here includes all plant hostile organisms such as fungi, insects, nematodes and viruses

From a climate perspective, Swedish field vegetables are generally a good choice for Swedish consumers, since the energy use involved in long transports, and the emission of greenhouse gases, are of large importance to the total result of life cycle analyses of field vegetables and of fruit. However, that does not mean that efforts to improve the situation should discontinue.

Most of the subsector's climate effect comes from the actual growing, and from the packaging, which shows that the largest environmental gains can be made here. The conclusion that the subsector's greatest environmental impact is caused by cultivation and packaging gives reason for aiming environmental measures at the production level. The use of fuel in production and in transport of both inputs and the finished product is, however, also a part of the sector's environmental impact. Fuel emits carbon dioxide and other undesirable substances that affect the environment, and its use should be reduced as much as possible.

7.2. Strengths and weaknesses in the subsector greenhouse vegetables

7.2.1. Production planning, continuity and the supply chain

Swedish production is naturally closer to the Swedish market than the competitors, who are mostly found in the Netherlands, even though the distance in time is shrinking as logistics become more efficient. Imports from Spain are large, but mostly take place when Swedish production is low. The proximity to consumers can be an advantage for products with limited shelf-life like tomatoes and cucumbers, if used properly. This means that the supply chain must work optimally.

As regards the supply chain, however, there is room for improvement both in pure logistics (delivering the products as quickly as possible) and in cooling and the cool chain. This is particularly true for greenhouse lettuce, since cucumber, tomato and certain herbs cannot be stored at low temperatures. As described above, if the supply chain is poor this will have a negative effect on the shelf-life, quality and nutritional value of the products. For products like tomatoes and cucumbers, that cannot be kept at low temperatures, time becomes an important factor, since aging can only partly be delayed by cooling (10-12 degrees is possible).

7.2.2 Quality, residues, microbiology, traceability

In general, the quality of Swedish greenhouse products is high. It could be further improved, however, particularly around midsummer and in the latter part of the season. One reason is that plants are sometimes kept longer than they should given the quality produced.

One problem with the "common" tomato is that consumers throughout Europe think that the product does not have enough taste. This of course has an effect on the level of consumption, and should be taken seriously.

The quality concept includes product health. Since increasing weight is attached to this issue, both in terms of residues and microbiological aspects, wholesalers and retailers would like to see increased supplier monitoring of these aspects.

Traceability work has produced good results in Sweden, and according to our information there are few problems in this area. However, several different systems are used. Some actors have expressed an interest in coordinating the systems.

Consumer packages, trays, or wrapping of individual products may be a way to maintain quality, extend shelf life and reduce waste. It may also create value-added for the product.

Reduced organic waste is good from an environmental point of view, but must be weighed against the waste caused by the package/wrapping material and negative environmental effects from this.

7.2.3 Marketing

Like in the case of field vegetables, the marketing efforts for greenhouse vegetables are not very coordinated. One exception is the tomato subsector, where coordinated measures have been taken, which is a good thing, since coordinated efforts have a greater chance of resulting in a positive effect. The fact that Sweden's consumption of fruit and vegetables is below the level recommended by the WHO could be emphasized, since the EU's intent by the marketing support is primarily to increase consumption on the whole.

Marketing often includes measures that could be considered the responsibility of the wholesalers and retailers, like exposure and quality in the store. Such work shall not entitle to support. It should therefore be possible to improve the marketing efforts by focusing on clear messages and by better coordination. One should point out, however, that it is always hard to evaluate the effect of marketing measures.

7.2.4 Product development and experimental production

Experimental production is not a focus area in itself, but rather a way of working within a certain area. In other words, it is a tool that can be used within several focus areas, like environment, quality or the development of new products. In this strategy, experimental production is tied to each focus area, and is therefore not given much space as a separate area.

Traditional Swedish production of greenhouse vegetables has comprised tomato, cucumber, head lettuce, and melon. However, production of melon and head lettuce is very small today. Instead, new products like potted lettuce¹⁴ and fresh potted herbs have expanded and today make up some 20 % each of the value of production of this subsector. In addition, production of greenhouse strawberries has also increased, and they too belong to this subsector. This means that there has been a good development of new products within the subsector in general.

Tomato production in Sweden is dominated by traditional tomatoes sold loose in shops. There has only been limited diversification into new types like truss tomatoes, plum tomatoes and cherry tomatoes. In the tomato subsector, there is room for product development to generate products with added-value compared to traditional production. There may also be a similar room within the cucumber subsector, but in this case it is harder to see alternatives to the traditional cucumber.

Product development also involves finding new types of consumer packaging in order to extend shelf-life and reduce damages and waste, and thereby increase the market value of the products. This kind of product development is also quite valuable, but needs to be coordinated with environmental efforts.

Product development is believed to be of great importance to the subsector, and the work should continue.

¹⁴ Production has been around for many years, so perhaps it is not fully correct to refer to it as new. However, it has increased strongly in recent years.

7.2.5 Crisis management

Crises within the sector could be caused by low prices or weather and natural phenomena. The greenhouse subsector is not subject to hail damage (except on greenhouses, but this is covered by “ordinary” insurances) and the flood risk is limited. On the other hand, the subsector can be hit by pathogens, including quarantine pathogens. When a quarantine pathogen is discovered, this often results in demands to destroy large quantities of plants, but compensation is rare. This is an area that can cause large problems for affected growers.

Price fluctuations should be dealt with by the industry itself. So far, they have also handled other crises. The new legislation, however, opens up for several different types of crisis management measures.

7.2.6 Environment and climate

Swedish greenhouse production of vegetables has a long tradition of biological plant protection, and the use of pesticides is low. There are only limited problems with some of serious pathogens that are the cause of severe problems in other countries. This advantage has been earned through solid phytosanitary efforts that have claimed a lot of resources. However, the situation is constantly changing since both international and national trade in the products and other closely related products¹⁵ spread new pathogens.

Greenhouse production has been successful in developing recirculating production systems that minimise nutrient leaching. An inventory in 2006, however, showed that only 27 % of the cultivated area and 19 % of the growers used this technology. Efforts to keep production healthy and to minimise pesticide and nutrient use and leaching should continue at a high level of ambition.

Packaging, both transport packaging (boxes, crates and cartons) as well as consumer packaging, generates large quantities of waste. The ambition should be to use circulating crates as much as possible. As regards consumer packaging, “conventional” (petroleum-based) plastics are mainly used today. In this case, the aim should be to switch to packaging made from renewable raw materials. The same applies to trays and other insets in transport packaging.

Sweden’s northern location means that more heating is required for greenhouse production compared to that of important competitor countries. Studies of energy consumption and greenhouse gas emissions show that energy consumption for greenhouse tomato in Sweden is many times higher than for field tomatoes from Spain (60 MJ/kg vs. 5 MJ/kg)¹⁶. The issue is related to costs and thus to competitiveness, but also to the environment. Increasing consumer interest in climate issues also makes it a consumer issue.

The ambition to reduce the use of external energy for heating greenhouses should thus be high for many reasons. External energy refers to energy supplied in the form of electricity, coal, oil, wood, wood chips, etc. Wind and solar energy generated at farm level are not included. A reduction in the amount of external energy used is not the only way to improve the situation; a conversion to bioenergy would also be considered a good thing. Considerable resources have been spent on this, which is evident from the fact that 2/3 of the greenhouse area used for tomato production is heated by biofuels.

¹⁵ Serious pathogens on vegetables can also spread through ornamental plants.

¹⁶ Carlsson – Kanayama, 1998

7.3. Strengths and weaknesses in the subsector fruit and soft fruit

7.3.1 *Production planning, continuity and the supply chain*

Production planning, continuity and the supply chain do not have the same meaning in the fruit subsector as in field or greenhouse production of vegetables, since the products are harvested on one occasion and then often stored. The production planning that takes place involves using varieties that ripen at different times and that can be stored for different periods of time. This allows a reasonably even and continuous supply of fruit until the stores are empty. This work has gone on for many years and should continue.

For a product like apple, that can be stored for a long period of time, proximity to consumers is not necessarily of great importance to quality. However, one advantage of short transports is that if it takes place in a sub-optimal climate, quality losses are smaller than in the case of long transports.

7.3.2 *Quality, residues, microbiology and traceability*

For apples, Sweden's northern latitude limits the number of available varieties, since many of the most common ones cannot be grown in Sweden, at least not with good quality. As for pears, the selection is even more limited, since this fruit needs higher temperatures than apples. Sweden's pear production is small today. For both apples and pears, the climate and the short growing season cause lower yields in Sweden than further south. However, in the case of strawberries, there seems to be no great limitations in varieties.

Sweden's climate means that the apple skin is thinner than in fruits grown in a warmer climate. This is why Swedish apples are more susceptible to bruising, and this is a quality problem for Swedish fruit. However, the climate also has positive effects, since low temperatures stimulate production of aroma substances. Fruit and soft fruit from cold climates often develop a stronger aroma than southern products, even though this is also a matter of varieties. Cold climates also stimulate formation of certain antioxidants, and this may have an effect on the nutritive value. However, this matter needs further study before any general claim can be made.

The quality work in the apple subsector has been successful in developing appropriate equipment for handling, sorting, storing and packaging. However, new equipment is constantly being developed, offering new opportunities. There are some quality problems associated with sorting, both regarding size and colour, and efforts to reduce these should continue. Furthermore, efforts should be made to increase the share of fruit sizes most in demand.

The quality concept includes the health of the products. Since increasing weight is attached to this issue, both in terms of residues and microbiological aspects, wholesalers and retailers would like to see increased supplier monitoring of these aspects.

Sweden's traceability work has produced good results, and according to our information there are few problems in this area. However, several different systems are used. Some actors have expressed an interest in coordinating the systems. Traceability in strawberry production is significantly less developed. Given the low participation rate for strawberry producers, it seems hard to address this problem through the work of the producer organisations.

The Swedish strawberry season is short and intense. Production is fragmented and the degree of organisation is very low, only two per cent. One problem in this subsector is the short

shelf-life, which is partly due to the characteristics of the strawberries, but is reduced further by shortcomings in the supply chain, not least the cooling process.

7.3.3 Marketing

Marketing efforts in the subsector fruit and soft fruit have been less fractured than in other subsectors, since both cultivation and PO participation are more concentrated. However, even though most fruit growers belong to one specific fruit growers' association there are fruit growers in several PO's. There is thus room for coordination also in this subsector, in order to prevent products from different producer organisations to compete with each other, which is not the intent of the EU marketing support. Instead, the aim is to further consumption on the whole. It is not insignificant in this context that Sweden's average consumption of 359 grams per day is below the WHO recommendation of 400 grams.

7.3.4 Product development and experimental production

Experimental production is not a focus area in itself, but rather a way of working within a certain area. In other words, it is a tool that can be used within several focus areas, like environment, quality or the development of new products. In this strategy, experimental production is tied to each focus area, and is therefore not given much space as a separate area.

Product development in this subsector mostly refers to the development of new varieties. Considering that it takes a very long time to produce completely new products in the form of new fruits, it is not realistic that a producer organisation in a country as small as Sweden should shoulder such work alone.

Product development also refers to the production of new types of packaging in order to extend shelf life, reduce damages and waste, and thereby increase the production value. This kind of product development can be valuable, but needs to be coordinated with the environmental work.

7.3.5 Crisis management

Crises in the sector can be caused by low prices or weather/natural phenomena. As regards weather, the subsector can be hit by hail damage with great financial losses as a result, and by frost during flowering, as well as by pathogens. Price variations should be dealt with by the market. Crises related to the weather, natural phenomena or pathogens have so far been handled by the sector itself. The new legislation, however, allows support for several different types of crisis management measures.

7.3.6 Environment and climate

From an environmental point of view, Swedish apples are a good choice for Swedish consumers. A life cycle analysis of apples from Sweden, France and New Zealand in 1997¹⁷ showed that the Swedish apples had the lowest environmental impact both as regards energy consumption and pesticide use. This shows that much good work has already been done within the sector. The work should continue in the same direction.

¹⁷ M. Stadig, 1997 Livscykelanalys av äppleproduktion – fallstudier för Sverige, Nya Zeeland och Frankrike. SIK, rapport 630.

The environmental impact of the sector is in general similar to that of field vegetables. It includes leaching of nutrients, pesticides and herbicides. Besides the risk that such substances may reach the groundwater, they can also have an effect on biodiversity and the balance of ecosystems. One of the clearest examples of this is the eutrophication of lakes and seas. Fuel for production and transport releases carbon dioxide and other undesirable substances that have an environmental effect.

As for field vegetables, it is not uncommon for growers to use more fertilizer than optimal. Also for fruit there should be a clear aim to change this strategy, since it has a negative impact on the environment. The use of pesticides should also include continuous efforts towards increased use of risk analyses and site-specific measures in order to reduce the environmental impact. Precision equipment can reduce the amounts of pesticides used and should therefore also entitle to support.

Packaging, both transport packaging (boxes, crates and cartons) as well as consumer packaging, generates large quantities of waste. The ambition should be to use circulating crates as much as possible. The figure below shows that the share sold in circulating crates varies from product to product, and in some subsectors there is considerable room for improvement. As regards consumer packaging, “conventional” (petroleum-based) plastics are mainly used today. In this case, the aim should be to switch to packaging made from renewable raw materials. The same applies to trays and other insets in transport packaging.

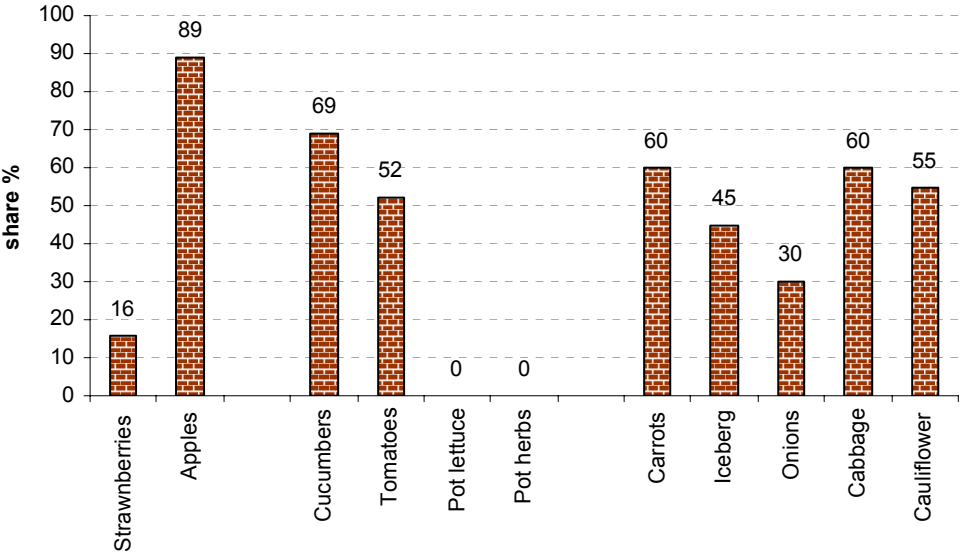


Figure 36. Share of marketed volume in PO's sold in circulating crates.

Source: Swedish Board of Agriculture

8. The relationship between the National Strategy and the Operational Programmes

This National Strategy is the framework that lays down the direction and scope of the Operational Programmes to be presented by Swedish producer organisations in the fruit and vegetable sector. The Operational Programmes contain the measures that the organisations intend to carry out, and are co-financed by the EU by 50 %, or in some cases 60 %¹⁸.

The Operational Programmes shall apply to the legislation below. The most important legislative texts are listed in Section 1. The following should be noted:

- The Operational Programmes shall meet at least two of the objectives referred to in Article 122 (c) and 103 (c) 1 of Regulation (EC) No 1234/2007.

Article 122 (c) acknowledges three different objectives for recognized producer organisations:

- (i) ensuring that production is planned and adjusted to demand, particularly in terms of quality and quantity;
- (ii) concentration of supply and the placing on the market of the products produced by its members;
- (iii) optimising production costs and stabilising producer prices.

Article 103 (c) 1 lists six objectives for the Operational Programmes of the producer organisations:

- a) planning of production
 - b) improvement of product quality
 - c) boosting the commercial value of products
 - d) promotion of the products, whether in a fresh or processed form
 - e) environmental measures and methods of production respecting the environment, including organic farming
 - f) crisis prevention and management
- Each separate measure of the Operational Programme shall meet at least one of the objectives in Article 122 (c) and Article 103 (c) (1) in Regulation (No) 1234/2007.
 - As laid down in Swedish regulation SJVFS 2008:32 § 10 the crisis management measures in Article 103 (c) (2) of Regulation (No) 1234/2007 that can be included in Operational Programmes in Sweden are:
 - training measures
 - harvest insurance
 - support for the administrative costs of setting up mutual funds
 - As laid down in Swedish regulation SJVFS 2008:32 § 10 support for harvest insurances may be granted for costs of insurance premiums, for insurances taken by the PO to cover for losses among its member companies when they are affected by plant pathogens, natural disasters and climatic events comparable to natural disasters.

¹⁸ The conditions that may entitle to 60 % EU financing are laid down in Article 103 (d) of Regulation (EC) No 1234/2007.

- Investments that increase the environmental pressure are only allowed if effective measures have been taken to protect the environment from this pressure (Article 103 (c) (5) of 1234/2007). In line with this requirement, no investments that concern the use of petroleum-based plastic materials in production will entitle to support.
- The following are clarifications to Annex VIII of Regulation (EC) No 1580/2007 on measures that do not entitle to support:

Item 1.

- Perennial plants in the form of fruit trees entitle to support when it comes to replacing varieties, not new establishment.
- Specific costs for organic material for plant protection is compensated through the operational fund up to 60 % of total eligible costs, see Chapter 3 § 5 in Swedish Regulation SJVFS 2008:32
- The following requirements apply to investments in individual companies (according to Chapter 3 § 17 in Swedish Regulation SJVFS 2008:32):
 - Investments in individual companies can only be accepted if they are a part of a larger strategy with a clearly quantifiable objective, and where the measure and the objective comprise several companies.
 - A inventory list showing the location of each investment shall be available at the producer organisation.
 - The investment shall be owned by the producer organisation, and this shall be clear from the inventory.
 - Any income from selling the investment shall go to the producer organisation, even if the object is fully depreciated.
- At least 10 % of expenses within the Operational Programmes for Swedish producer organisations shall refer to environmental measures i.e. measures listed under section 9.6 in the National Strategy. Section 9.6 is the Swedish National Framework for environmental actions for producer organisations (Article 103 (c) (3) in 1234/2007).
- The environmental actions, under section 9.6. of the National Strategy, selected under an Operational Program must:
 - Respect the requirements for agri-environmental payments set out in the first subparagraph of Article 39 (3) of Council Regulation (EC) No 1698/2005, and in particular go beyond:
 - The relevant mandatory standards established pursuant to Articles 4 and 5 of and Annexes III and IV to Regulation (EC) No 1782/2003;
 - Minimum requirements for fertilizer and plant protection product use established by national legislation;
 - Other relevant mandatory requirements established by national legislation.
 - Be conformed to the National Framework;
 - Be compatible and complementary with the other environmental actions implemented under the Operational Programme and, where appropriate, with

the agro-environmental commitments, supported under the Rural Development Programme, implemented by the members of the producer organisation.

- Where an Operational Programme entails the possibility of combining different environmental actions and/or where the environmental actions selected under the Operational Programme may be combined with agro-environmental measures supported under the Rural Development Programme, the level of support must take account of the specific income forgone and additional costs resulting from the combination.
- The support for the environmental actions selected under an Operational Programme, which is intended to cover additional costs and income forgone resulting from the actions, could be modified in case of amendments of the relevant reference level (i.e., the set of standards beyond which an environmental commitment must go).
- In the case where the National Framework provides for an environmental action (other than investments) that is similar to an agri-environmental measure included under the Rural Development Programmes (e.g. actions on matter of emission prevention, landscape and habitat protection or soil protection, where the duration is an essential condition for its effectiveness, i.e. for attaining the expected environmental benefits), the same duration should apply as the similar agri-environmental measure concerned, unless a different duration can be justified in the National Framework.
- In the case where the duration of the Operational Programme is shorter (i.e. 3 or 4 years) than the duration referred to above, the Producer Organisation should be obliged to continue the environmental action concerned in its subsequent Operational Programme, if this is necessary for attaining the duration applying for similar agri-environmental measures under the Rural Development Programmes, except for duly justified reasons, and in particular based on the results of the mid-term evaluation of the Operational Programme provided for in Article 127(3) of Commission Regulation (EC) No 1580/2007.
- In the future, where relevant, the abovementioned requirements related to duration will also apply to other environmental actions newly included in the National Framework.

9. Strategy and measures selected based on strengths and weaknesses

9.1 Strategy and measures – production planning, continuity and the supply chain

The basic meaning of production planning is to schedule¹⁹ production in order to obtain continuous harvests, particularly of products that can yield several harvests during one growing season. Such planning takes place within the subsectors of vegetable field crops and greenhouse production of lettuce and herbs. Common planning at the PO level is also necessary within cucumber production, where the plant material is replaced once or twice each season, in order to make sure that not all producers replant at the same time.

Production planning in the fruit subsector refers to planning the supply in order to provide apples that can be sold at different times of the year, partly because they are harvested at different times but also because there are differences in how long they can be stored.

Production planning is essential in order to ensure continuity of supply to buyers, to optimize selling options, and for good profitability. It should continue and be improved continuously.

Production planning has been carried out for many years, and goes on continuously. This should be seen as a normal production cost. Costs related to the improvement of the precision and the result of the production planning should, on the other hand, entitle to support.

Operational Programmes should define the weaknesses and development opportunities in existing prognosis systems, in order to focus on adjustment and improvement of the existing weaknesses.

Actions that may entitle to support

1) *Description of action:* New and improved tools for production planning.

Justification: Ensuring optimal planning of production.

Commitment: Planning of production in terms of quantity and quality.

Eligible costs: Investments in computer software and hardware.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7. General measures.

2) *Description of action:* Improvement of placing of fruit on the market by optimising varietal volumes.

Justification: Improving the placing of fruit on the market.

Commitment: Exchanging existing fruit trees for different varieties according to existing plan.

Eligible costs: Investment cost for grubbing up existing trees and planting new trees or for grafting new varieties on existing trees.

¹⁹Scheduling means to multiply the expected time by the temperature, and use the result as a basis for calculating the time from sowing/planting to harvest, thereby obtaining an even production volume at the desired level.

3) Common distribution centre

An overall objective of the support to Producer Organisations is to strengthen cooperation between producers. Many measures should be implemented collectively, like sorting, packaging, storing and distribution, in order to make these activities more efficient. In most cases, this requires common purpose-built premises. Investments in common premises should therefore entitle to support.

Output indicators

- Number of holdings participating in the actions (compulsory)
- Number of actions undertaken (compulsory)
- Total value of investments (where relevant)
- Area or quantity comprised by production planning (where relevant)
- Area or quantity comprised by exchange of varieties (where relevant)

Result indicators:

- Change in volume of marketed production (compulsory).
- Change in value of total marketed production (compulsory).
- Deviation factor based on comparing the planned/desired quantity to be marketed each week with the actual quantity.

9.2 Strategy and measures – quality, residues, microbiology and traceability

The quality concept includes i.a. external quality, (size, shape, etc.) inner quality (taste, aroma, texture, nutritive value and shelf-life) and food safety (freedom from pesticide residues and toxins as well as microbial health). Efforts to improve quality can refer to measures both during cultivation as well as during and after harvest.

Producer Organisations should have a comprehensive quality strategy with clear, quantifiable objectives.

Measures for improving and ensuring production quality should be taken. Whenever possible, relevant and financially reasonable, quality parameters at production level should be used. In order to promote such work, analyses of the nutritive status of soil and plant material should entitle to support. Measures to improve quality of irrigation water should be eligible for support. Investments in hail nets and cloud seeding equipment are linked to the production quality of the products, and thus fall within the framework of those efforts. Another aspect linked to quality is the use of appropriate varieties in fruit production (apples, pears, plums and cherries). The exchange of varieties should therefore entitle to support, while costs for establishing new plants should be considered a normal, production-related investment and therefore not be eligible for support.

The quality that is created by good cultivation practises must be followed-up by optimal handling during harvest, sorting, packaging and quality control. In some cases, there is also storing to consider.

The importance of Calcium for improving shelf-life by stabilizing cell membranes and the middle lamellae is well established. Since the auxin contained in seeds improve fruit sink strength for Calcium, good pollination is important for fruit quality and shelf-life. Support for the use of bumble bees in tomato production is therefore motivated.

Measures to reduce damage during harvest should be considered, since damage reduces quality, shelf-life and nutritive value. Examples of eligible measures are training of staff (eligible under section 9.7 general measures) and investments in new equipment intended to reduce the frequency of damage.

For all products, there should be clear objectives regarding cooling after harvest²⁰. This is of particular importance for sensitive products, i.e. those with a short shelf-life. This work may clarify the need for more effective cooling equipment, but may also provide an overview of where coolers should be placed, since they should not be placed too far from the production site if the harvested produce is to be cooled quickly. As regards products that can be stored, investments in storage and cooling equipment and CA/ULO²¹ may be motivated.

Measures should be taken to improve sorting and ensure good quality. This is a good reason to provide support for improved sorting equipment, quality improvement systems, and quality control.

Traceability can today be seen as a part of the quality concept. All Swedish producers should aim for good traceability. Support should be granted for the purchase of traceability systems if none exist at present, as well as for conversion to simpler, coordinated and/or more suitable systems.

Certification for Integrated production and for Organic production assures the conformity of production and handling with specified rules aiming at reaching a certain quality level in terms of production practices. This assurance should therefore be regarded as a quality measure and eligible as such.

Actions that may entitle to support

1) *Description of action:* Hail damage prevention.

Justification: Improvement of product quality

Commitment: New investment

Eligible costs: Investments in hail nets and in cloud seeding equipment

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

2) *Description of action:* Improving quality of harvested products by washing, sorting and packing.

Justification: Improving quality and value of marketed products.

Commitment: New investments or replacement of existing equipment with improved technology. Use of equipment and technique according to specifications and recommendations.

²⁰ This could be done for instance by stating a target temperature and at what time after harvest that this temperature shall be reached.

²¹ MA (Modified Atmosphere), CA (Controlled Atmosphere) and ULO (Ultra Low Oxygen) are three designations of methods that are based on storage/keeping in an atmosphere of reduced oxygen and increased carbon dioxide.

Eligible costs: Investments in equipment for washing, sorting, film wrapping and packaging. Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

3) *Description of action:* Improving quality by harvest cooling

Justification: Improved quality by reducing product temperature after harvest.

Commitment: Cooling of products as quickly after harvest as possible.

Eligible costs: Investments in harvest coolers.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

4) *Description of action:* New or improved storage coolers.

Justification: Improving facilities for storage of products at low temperatures.

Commitment: Using the facilities according to recommendations for optimal storage quality.

Eligible costs: Investments in new coolers or in replacement of existing coolers.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

5) *Description of action:* Improved storage quality through controlled or modified atmosphere.

Justification: Improving quality after storage and extending storage life.

Commitment: Using the facilities according to recommendations for optimal storage quality.

Eligible costs: Investments in equipment and storage facilities for Controlled atmosphere storage, Ultra low Oxygen technique and Modified atmosphere.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

6) *Description of action:* Improved fruit quality through use of appropriate varieties.

Justification: Improved fruit quality.

Commitment: Exchanging existing fruit varieties for different varieties.

Eligible costs: Investment cost for grubbing up existing trees and planting new trees or for grafting new varieties on existing trees.

7) *Description of action:* Improvement of water quality.

Justification: Improved food safety.

Commitment: Investment in water improvement technology going beyond the requirements set down by law.

Eligible costs: Investment costs.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

8) *Description of action:* Water and soil analyses

Justification: Identifying potential problems with leaching of nutrients and/or pesticides or herbicides used in production.

Commitment: Respect of points (a), (b) and (c) outlined in section 9.7 of the National Strategy and § 15 in Chapter 3, of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge, charge for analyses and costs for travel, food and accommodation for advisors and consultants.

9) *Description of action:* Leaf and fruit analyses.

Justification: Optimising production output and post-harvest quality.

Commitment: Respect of points (a), (b) and (c) outlined above and in Chapter 3, § 15 of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge, charge for analyses and costs for travel, food and accommodation for advisors and consultants.

10) *Description of action:* Bumblebees in tomato production.

Justification: Improved tomato fruit quality.

Commitment: Use of bumblebees in production. No use of pesticides that may harm the bumblebees.

Eligible costs: Costs for bumblebees.

11) *Description of action:* Quality certification.

Justification: Improved product quality.

Commitment: Respect of the certification's guidelines and commitments.

Eligible costs: Costs for certification and compulsory revisions. Revisions due to previously found errors and irregularities are not eligible for aid.

12) *Description of action:* Traceability.

Justification: Improved traceability and thereby improved food safety.

Commitment: Traceability projects going beyond requirements of existing law.

Eligible costs: Costs for improved traceability. Only costs for traceability projects going beyond requirements of existing law are eligible for aid.

Output indicators:

- Number of holdings participating in the actions (compulsory).
- Number of actions undertaken (compulsory)
- Total value of investments (where relevant)

Result indicators:

- Change in volume of marketed production that meets the requirements of a specific quality scheme (compulsory).
- Change in value of total production (compulsory).
- Estimated impact on production costs (compulsory).
- Share of products in each quality Class (Extra, I and II) (where relevant).
- Share of waste (where relevant).
- Share of complaints (where relevant).
- Change in average selling price (where relevant).

9.3. Strategy and measures – marketing

The overall purpose of marketing measures should be to increase consumption of fruit and vegetables in general, but also of specific products or product groups. A logical consequence of this is that the target group of any marketing measure should be the consumers. In motivated cases, actions aimed at wholesalers and/or retailers may entitle to support.

The measures shall provide information about the products. Price informing commercials are a normal sales cost for the trade, and shall not entitle to support. Measures regarding exposure at retail level are also considered normal marketing costs and shall not entitle to support.

An issue that has been discussed repeatedly within the EU is whether quality designations and their link to geographical regions create value-added or not. However, the fact that production takes place within a certain area, or locally, is not a sure guarantee that the products are of a certain quality (see section 7). As a consequence, EU legislation does not allow support for the marketing of a geographical designation unless certain special circumstances apply. This is true irrespective of whether reference is made to a country or a region.

Quality designations based on established quality criteria that single out certain products have a potential to create value-added, and also entitle to support in accordance with EU legislation. Development of quality designations shall therefore entitle to aid within the support to Producer Organisations. The framework for naming quality designations may be analysed further.

Information via websites is today a common tool for reaching consumers. Efforts to create websites and to upgrade them should therefore entitle to support.

Market surveys can provide useful information about consumer attitudes, consumption trends, etc. This type of activities should therefore be permitted in Operational Programmes and entitle to support.

Measures that may entitle to support

1) *Description of action:* Marketing through TV-commercials.

Justification: Improved exposure to consumers.

Commitment: No price information. EU-logo must be visible.

Eligible costs: Costs for making TV-commercials and for air time.

2) *Description of action:* Marketing through newspaper advertisements and on information sheets.

Justification: Improved exposure to consumers.

Commitment: No price information. EU-logo must be visible.

Eligible costs: Cost for making newspaper advertisements and information sheets and for publishing in newspapers and magazines.

3) *Description of action:* Shop demonstrations.

Justification: Increased exposure to consumers.

Commitment: No price information. EU-logo must be visible.

Eligible costs: Costs for shop demonstrations.

4) *Description of action:* Construction and maintenance of PO-web-site.

Justification: Marketing of PO and its products.

Commitment: EU-logo must be visible on web-site.

Eligible costs: Costs for construction and maintenance of PO-web-site.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

5) *Description of action:* Development of quality designations

Justification: Increase product value.

Commitment: Respect of the quality parameters connected to the designation.

Eligible costs: Cost for the development of a quality designation.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

6) *Description of action:* PR campaigns with a special focus.

Justification: Improved information and exposure to consumers.

Commitment: To show the EU logo in generic PR and not to show the EU logo in PR for the PO.

Eligible costs: Cost for PR campaigns with a special focus.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

Output indicator:

- Number of actions undertaken (compulsory)

Result indicators:

- Change in value of marketed production (average selling price) (compulsory)
- Change in volume of marketed production (quantity placed on the market) (compulsory)

9.4 Strategy and measures – product development and experimental production

Product development and experimental production is necessary for improving varieties, production technique, and handling after harvest.

Finding new varieties can aim at improving yield, quality, taste, shelf-life, storability, timing of production or the placing on the market or finally reduce need for pesticides, herbicides and/or fertilizers.

Finding new products aims at finding new markets and increase the total production of the PO.

For sensitive products, there may be a reason to develop useful packaging, in order to maintain quality and reduce waste. However, environmental aspects must be taken into account, so that the amount of waste materials does not increase unnecessarily. Article 103 (c) 5 of Council Regulation (EC) No 1234/2007 states that investments that increase the environmental pressure are only permitted in case effective measures have been taken to protect the environment against the extra pressure.

In the opinion of the Board of Agriculture, no measures can be taken to protect the environment from the extra pressure of increasing the number of plastic consumer packaging, since these will spread all over the country. Support will therefore not be granted for developing new consumer packaging of “conventional” plastic materials. On the other hand, development of consumer packaging in plastic materials from a minimum of 50 % renewable raw materials should entitle to support. The same principle should apply also to plastic film and trays. Support for consumer packages is described in more detail in section 9.6.e. on environmental measures.

The development cost for producing new packaging in traditional petroleum-based plastics shall only entitle to support if the carbon dioxide use (in carbon dioxide equivalents) is at least 20 % less than for the packaging they are meant to replace. The concept packaging here includes plastic film for wrapping individual products (like cucumbers) and trays for presentation of fruit in boxes.

Experimental production can also be focused on production technique with the aim of improving yield, quality, taste, storability, timing of production or the placing on the market or finally to reduce the need for pesticides, herbicides and/or fertilizers.

Experimental production can be used in order to try out new predators or change the way these are used.

Finally experimental production can focus on post-harvest handling, not least on improving storage techniques, improved cold storage facilities and improved CA/MA-storage and its use.

Actions that may entitle to support:

1) *Description of action:* Development of new varieties and variety trials.

Justification: Improving yield, quality, taste, shelf-life, storability, timing of production or the placing on the market or reduce need for pesticides, herbicides and/or fertilizers.

Commitment: Respect the requirements set down for experimental production in Swedish regulation SJVFS 2008:32, Chapter 3, § 13. The activities must be entrusted to additional (internal or external) qualified personnel.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

2) *Description of action:* Trials with new products.

Justification: Finding new markets and increase total production of PO.

Commitment: Respect the requirements set down for experimental production in Swedish regulation SJVFS 2008:32, Chapter 3, § 13. The activities must be entrusted to additional (internal or external) qualified personnel.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

3) *Description of action:* Developing new environmental consumer packages.

Justification: Developing consumer packages with decreased environmental impact.

Commitment: The new consumer package shall be made in a plastic material made from a minimum of 50 % renewable raw materials or the carbon dioxide use for the entire life cycle (in CO₂ equivalents for) is at least 20 % less than for the packaging they are meant to replace.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

4) *Description of action:* Improved production technique.

Justification: Improving yield, quality, taste, storability, timing of production or the placing on the market or reduce need for pesticides, herbicides and/or fertilizers.

Commitment: Respect the requirements set down for experimental production in Swedish regulation SJVFS 2008:32, Chapter 3, § 13. The activities must be entrusted to additional (internal or external) qualified personnel.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

5) *Description of action:* Use of “new” predators or improved use of existing predators.

Justification: Reduce the need for pesticides.

Commitment: Respect the requirements set down for experimental production in Swedish regulation SJVFS 2008:32, Chapter 3, § 13. The activities must be entrusted to additional (internal or external) qualified personnel.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

6) *Description of action:* Improved post-harvest handling and storage.

Justification: Increase product value.

Commitment: Respect the requirements set down for experimental production in Swedish regulation SJVFS 2008:32, Chapter 3, § 13. The activities must be entrusted to additional (internal or external) qualified personnel.

Eligible costs: Cost for planning, work with trials, evaluation and dissemination of results.

Output indicators:

- Number of holdings participating in the actions (compulsory)
- Number of actions undertaken (number of experiments/trials carried out) (compulsory)

Result indicator

- Number of new techniques, processes and/or products adopted since the beginning of the Operational Programme (compulsory).

9.5 Strategy and measures – crisis management

Crises may be caused by low prices or by weather / natural phenomena. In Sweden there have been no serious low-price crises caused by surplus production in the last ten years. In the opinion of the Board of Agriculture, there is no serious risk of surplus production in the next years either. Price fluctuations have been fully dealt with by the market in Sweden. This should be the case also in the future.

Crises caused by weather and natural phenomena in Sweden comprise the following:

- a) hail damage
- b) floods,
- c) frost during flowering
- d) pathogen infestations (fungi, viruses, pests and nematodes)

Crises of this kind as well have so far been handled by the sector. However, the Board of Agriculture notes that natural phenomena and pathogens can cause considerable financial damage to Swedish cultivations. Premiums for harvest insurances covering losses in member companies caused by pathogens, natural disasters and climatic events comparable to natural disasters should therefore be eligible for support. Administrative costs for setting up mutual funds and training measures to prevent and limit damage shall also be eligible.

Measures to deal with items (a) to (d) that may entitle to support are:

1) *Description of action:* Harvest insurances

Justification: Improving the security for growers in terms of possible damage from weather and natural phenomena.

Commitment: The rules set down in Swedish regulation SJVFS 2008:32, Chapter 3, § 11 concerning harvest insurances must be respected.

Eligible costs: Cost for insurance premiums.

2) *Description of action:* Setting up of mutual funds.

Justification: Improving the security for growers in terms of possible damage from weather and natural phenomena.

Commitment: The rules set down in Swedish regulation SJVFS 2008:32, Chapter 3, § 12 concerning mutual funds must be respected.

Eligible costs: Costs for the setting up of mutual funds but limited to 250 000 SEK during the first year of the fund, 200 000 SEK during the second year and 100 000 SEK during the third year.

Outcome indicators

- Number of actions undertaken (compulsory)
- Number of members taking part in any crisis management measure (compulsory)

Result indicators

- Total value of the insured risk
- Total value of the mutual fund set up

9.6 Strategy and measures – environmental and climate issues²² (National Framework for environmental actions)

This section outlines the Swedish framework for environmental actions within the Operational Programmes of Producer Organisations in the fruit and vegetables sector.

Based on Article 103 (c) (3) of Commission Regulation (EC) No 1234/2007 as well as Swedish Regulation SJVFS 2008:32, Chapter 3 § 10, the Operational Programmes of Swedish Producer Organisations and the measures carried out shall to at least 10 % concern environmental measures.

Further requirements are set out in Chapter 8. The relationship with the Rural Development Programme is set out in section 10.4 and administrative procedures to avoid double financing between the support to Producer Organisations and the Rural Development Programme are set out in Chapter 12.

²² The section on environmental measures is identical to the National Framework on environmental measures within the operational programme for the fruit and vegetable sector.

The environmental work comprises several parts. Taking into account the analysis on needs and priorities made in previous chapters (mainly in chapters 6; 7.1.6; 7.2.6 and 7.3.6) the environmental actions will focus on:

- Climate effect
- Effects on land, air, water and the organisms living there
- Biodiversity
- Use of natural resources and waste management

When the Operational Programme and all its measures are designed, environmental aspects shall always be taken into consideration. When decisions include the weighing of various options (all kinds of decisions – not just about environmental aspects), environmental aspects shall be an important consideration. The Board of Agriculture's plans of action for reducing plant nutrient losses, for organic production and for pesticide use in agriculture and horticulture²³ (and perhaps a future plan of action on climate effects) shall be important tools in this work.

Article 103 (c) (5) of Council Regulation (EC) No 1234/2007 establishes that investments that increase the environmental pressure may only be permitted if effective measures have been taken to protect the environment against the extra pressure. This means that no measures that concern plastics in production shall entitle to support in Sweden. Plastic covering of field crops, or use of plastics in greenhouse production, or of plastic tunnels to extend the cropping season, thus do not entitle to PO support in Sweden. Plastic materials made from at least 50 % renewable raw material are however eligible for support. For these materials support is given for the specific (extra) cost compared to conventional petroleum-based plastic materials. Measures leading to an increased use of energy or pesticides are also not eligible for aid.²⁴

The environmental work should aim at minimizing:

- (a) leaching from fertilization,
- (b) leaching of chemicals during cultivation and other negative effects from their use
- (c) fuel consumption,
- (d) use of external energy and emissions of CO₂ and other undesired compounds from heating of greenhouses and storage-, distribution- and other production related facilities
- (e) quantities of non-biological waste.

The environmental work should also encourage:

- (f) replacement of fossil energy sources for the heating of greenhouses and storage-, distribution- and other production related facilities
- (g) conversion to organic production methods
- (h) use of fertilizers produced in an environment-friendly manner
- (i) use of organic waste

The following strategy is proposed:

- (a) Minimizing leaching from fertilization, and

²³ In the summer of 2008 a new edition has been published under the name "Plan of Action for sustainable plant protection".

²⁴ Indirect effects are not included since this would eliminate support to participation in training programmes or study trips etc.

(h) Encouraging the use of fertilizers produced in an environment-friendly manner

The greenhouse subsector has come a long way regarding the development of needs-adapted fertilizing strategies and minimizing leaching by recirculating production systems where water and nutrients are circulated in a closed system kept in microbiological balance by a biofilter. However, a majority of growers still do not use this technology. Efforts to convert to recirculating production systems should therefore continue. The costs for investments in such systems should therefore entitle to support.

Field production of fruit, soft fruit and vegetables often involves the use of more fertilizer than necessary, and the cost is considered a risk premium²⁵. Environmental work should focus on a transition from general fertilization recommendations to site-specific strategies and methods. Computer-based decision support could be a useful tool in this regard. Use of precision equipment for application will also help reduce leaching.

A well-functioning crop rotation contributes to catching and binding nutrients. Crop rotation based on knowledge about how and when plant nutrient leaching arises should therefore replace general crop rotation recommendations. Normal crop rotation work falls within the framework of Good Agricultural Practices and should therefore not be eligible for support. The cost of consultants and of work with site-specific crop rotation schemes shall, on the other hand, entitle to support under general measures (section 9.7.).

The objective should also be to use fertilizers produced with environmental friendly technologies i.e. where production of the fertilizer only yields small discharges of carbon dioxide and nitrous oxide. The specific (extra) cost for fertilizers produced with a technology reducing emissions of greenhouse gases by at least 25 % compared to conventionally produced fertilizers shall therefore be eligible for support.

Risk analyses can identify sensitive areas and allow specific measures. Some areas that should be given extra attention are cultivation on light soils near watercourses. Production on organic soils should also be evaluated, not least in respect of the climatic impact.

Yet another important factor is irrigation strategies, since excessive irrigation leaches nutrients from the soil. Irrigation prognoses are useful tools in irrigation strategies, as is web-based decision support. The cost for developing or access to such tools should entitle to support, but the day-to-day work should not.

Actions that may entitle to support

1) Description of action: Preparation and implementation of fertilization plan.

Justification: Reduction of fertilizer leaching.

²⁵ Fertilisation strategies for improving nutrient utilisation in field-grown potatoes and vegetables, 2007; Riley, H., Salo, T., Thorup-Kristensen, K., Sandin, H., Gertsson, U.

Commitment: Following fertilization plan for a minimum of five years.

Eligible costs: Computer based decision support for fertilization; Computer based decision support for irrigation; Investment costs for precision equipment for application of nutrients and for irrigation.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

2) *Description of action:* Recirculating water and fertilizer systems for greenhouse production (not including organic production).

Justification: Reduction of fertilizer leaching in the greenhouse sector.

Commitment: Installation of the system and use of the system according to specifications and recommendations.

Eligible costs: Investment costs.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

3) *Description of action:* Specific costs for fertilizers produced in an environment-friendly manner.

Justification: Reduction of emissions of carbon dioxide and nitrous oxide from production of fertilizers.

Commitment: Using the environmental friendly fertilizers.

Eligible costs: Specific, extra costs, for N and P fertilizers, for greenhouse production and field production, produced with a technology reducing emissions of greenhouse gases by at least 25 %.

(b) Minimizing leaching of chemicals during cultivation and other negative effects from their use

The overall objective regarding chemicals in fruit, soft fruit and vegetable production, for combating pathogens and weeds, should be to minimise use as far as possible. This should be done by increased focus on adaptation to need. Important tools in this work include the use of predators (if any) and computer-based decision support. In addition, the use of risk analysis should increase.

In the greenhouse sector, predators have long been used to combat pests. The concept of predator use also includes advisory services. To the extent that biological plant protection is available for the pest in question, there has to be a **very** good reason for deciding to use chemicals instead.

The use of risk analysis should increase for vegetable field crops as well as for fruit and soft fruit. Risk analyses can identify critical areas, and special steps can be taken to reduce the amount of chemicals used but also to reduce the negative effects of the substances used. Areas meriting special attention are mould in onions and in strawberries.

Prognoses and computer-based decision support are important tools in the combating of e.g. carrot flies, actebia and gherkin double-square spot in vegetable field crops, and of scab and other pathogens on apples and pears.

The importance of crop rotation for reducing the need for plant protection is addressed in Section 7. Normal crop rotation work falls within the framework of Good Agricultural Practices. The cost of consultants and of work with site-specific crop rotation schemes, should on the other hand entitle to support under section 9.7. general measures.

Increased precision in the application of pesticides is also a way of reducing chemical use. One example is a tunnel sprayer for use in orchards. Common investment in (often expensive) precision equipment can be a way to make them available also to smaller farms. Precision equipment purchased in order to decrease pesticide use shall therefore be eligible for support.

Actions that may entitle to support

1) *Description of action:* Preparation and implementation of plant protection plan.

Justification: Reducing leaching of plant protection compounds

Commitment: Following the plant protection plan for a minimum of five years

Eligible costs: Investment costs for precision equipment for application, 60 % of cost for predators, costs for computer based decision support, investment in spore filters, and cost of investment in forecasting equipment.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

2) *Description of action:* Biobeds for storing sprayer in greenhouse

Justification: Reduces leaching from sprayer during storage

Commitment: Storing the sprayer in the biobed

Eligible costs: Investment cost for biobed

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

3) *Description of action:* Preparation and implementation of weed control plan

Justification: Reducing leaching of weed control compounds

Commitment: Following the weed control plan for a minimum of five years

Eligible costs: Investment costs for precision equipment for application.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

4) *Description of action:* Thermal weed control

Justification: Reducing leaching of weed control compounds

Commitment: Using thermal weed control in production

Eligible costs: Investment costs in equipment.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

(c) Minimising fuel consumption

One objective of the environmental work should be to minimise fuel consumption. A measure in this area is use of rail for long distance transport. Rail transport may however be more expensive than road transport. The specific, extra cost for rail transport should therefore be eligible.

Fuel consumption can be reduced by auditing the PO's logistic arrangements. Costs for this should therefore be eligible under general measures, section 9.7.

Actions that may entitle to support

Description of action: Minimising fuel consumption.

Justification: Reducing carbon dioxide emissions from fuel consumption

Commitment: Use of rail transport in the cases where extra costs are supported

Eligible costs: Specific extra costs for rail transport.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

(d) Minimising use of external energy and emissions of CO₂ and other undesired compounds from heating of greenhouses and storage-, distribution- and other production related facilities;

(f) Encourage replacement of fossile energy sources for the heating of greenhouses and storage-, distribution- and other production related facilities

The basis for the environmental work regarding heating of greenhouses and other production-, storage- and distributionfacilities should be to reduce energy consumption in order to create systems with minimal input of external energy. Whether or not a zero vision²⁶ is a realistic long-term goal need not be a central issue if the objective is to strive for as far-reaching a result as it is possible as well financially realistic.

Measures to conserve energy should be a central focus of this work. Use of thermal screens in greenhouse ceilings is widespread, but since the screens have a limited lifespan the measure has to be regarded as ongoing. Use of thermal screens along the walls is more limited, and should increase.

²⁶ A zero vision refers to a system requiring no external energy apart from what is received from sun, wind, water, earth and rock.

There are several technical solutions for replacing fossil energy sources. Investments in geothermal energy, bedrock heat pumps, air heat pumps, waste heat, wind turbines, wave energy and solar cells as well as conversion from oil or coal to woodchip heaters and pellet heaters means conversion to renewable energy sources. Conversion to gas heating means reduction of emissions of CO₂ and should therefore also be eligible for support. These investments are often supplemented by the installation of accumulator tanks (which store heat in water from warm periods to be used during colder periods). During the cold periods when the energy stored in the tank is used this energy also replaces a fossil energy source and these investments should therefore also be eligible under the same heading.

Considerable improvements in energy conservation can also be achieved by control and regulation techniques. These should therefore be eligible under section 9.7., general measures.

During part of the year, lighting greenhouses may consume considerable amounts of energy. In case conversion to new technology would result in significant savings, this should be welcomed and therefore be eligible for support. Developments in the area of light-emitting diodes may be worth following.

Actions that may entitle to support

1) *Description of action:* Energy saving.

Justification: Reduction of energy consumption, and thereby of emissions of greenhouse gases, for heating of greenhouses

Commitment: New installation of thermal screens or replacement of worn out screens. Use of the thermal screens according to recommendations and specifications.

The expected reduction in energy used will be assessed ex-ante on the basis of technical specifications; the expected reduction in energy use must be of 25 % at least. It may be less, but not lower than 10 %, when together with the reduction in energy use (and in CO₂ emissions) there is at least another environmental benefit combined (e.g. reduction in the emissions of air pollutants).

Eligible costs: Investments in thermal screens.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

2) *Description of action:* Improved insulation of greenhouses.

Justification: Reduced CO₂ emissions

Commitment: Replacement of existing glassing (or equivalent material) with more energy conserving material.

The expected reduction in energy used will be assessed ex-ante on the basis of technical specifications; the expected reduction in energy use must be of 25 % at least. It may be less, but not lower than 10 %, when together with the reduction in energy use (and in CO₂ emissions) there is at least another environmental benefit combined (e.g. reduction in the emissions of air pollutants).

Eligible costs: Investment costs for conversion from single glazing to double or triple glazing (or equivalent materials) or from double glazing to triple glazing (or equivalent materials).

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

3) *Description of action:* Replacement of fossil energy sources

Justification: Reduced use of fossil energy

Commitment: New installation and using the environmental friendly source of energy.

Eligible costs: Investment costs for conversion to geothermal energy, bedrock heat pumps, air heat pumps, waste heat²⁷, solar panels and wind mills, and for conversion from oil or coal to heating with wood-chips and pellets. Investment costs for the installation of accumulation tanks.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

4) *Description of action:* Conversion from oil or coal to heating with gas.

Justification: Reduced CO₂ emissions.

Commitment: Replacing an installation and using the environmental friendly source of energy.

The expected reduction in energy used will be assessed ex-ante on the basis of technical specifications; the expected reduction in energy use must be of 25 % at least. It may be less, but not lower than 10 %, when together with the reduction in energy use (and in CO₂ emissions) there is at least another environmental benefit combined (e.g. reduction in the emissions of air pollutants).

Eligible costs: Investment costs for conversion from oil or coal heating to heating with gas.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

5) *Description of action:* Flue gas cleaning

Justification: Cleaning of flue gas from emissions of environmentally non-friendly substances.

Commitment: New installation and thereafter maintaining the function of the system according to specifications and recommendations. The air pollutants to be reduced in the project must be clearly specified.

Eligible costs: Investment in flue gas cleaning technology going beyond the requirements set down by law.

²⁷ Waste heat means using surplus heat from power stations or industries.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

6) Description of action: New low energy light technology

Justification: Reducing the need for energy for lighting.

Commitment: New installation and thereafter maintaining the installation according to specifications and recommendations.

The expected reduction in energy used will be assessed ex-ante on the basis of technical specifications; the expected reduction in energy use must be of 25 % at least. It may be less, but not lower than 10 %, when together with the reduction in energy use (and in CO₂ emissions) there is at least another environmental benefit combined (e.g. reduction in the emissions of air pollutants).

Eligible costs: Investment costs.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

(e) Minimising quantities of non-organic waste

Work on minimising the amount of non-organic waste may focus on several areas. One area is the use of plastic materials in production, as ground cover or for tunnels. In this case, there is room for more environment-friendly alternatives. Conventional, petroleum-based plastic materials shall not be eligible for support. Specific costs (extra cost) for plastic materials made of at least 50 % renewable raw material shall however be eligible for support²⁸.

Another important area is conversion to recirculating packaging, i.e. plastic crates that are washed between uses. Costs for steam machines for cleaning plastic crates or extra cost for eco-labelled detergent for the cleaning of crates is eligible for support. As an option, the specific costs related to cleaning, collecting, sorting and distribution of clean boxes to the PO are eligible for aid.

Environmental aspects should be considered in relation to consumer packages. Therefore, the specific, extra cost for consumer packaging made from at least 50 % renewable materials may entitle to support according to Annex VIII, paragraph 1, third indent. Support is granted for 30 % of the packaging cost²⁹, but no more than 10 % of the budget each year³⁰.

In order to increase the amount of cardboard being recycled, compressors used to compress carton material may entitle to support.

²⁸ "Specific cost" means the cost for the plastic material produced from at least 50 % renewable raw materials minus the cost for a comparable conventional petroleum-based plastic material.

²⁹ This is equivalent to 15 per cent Community support and 15 per cent from the producers' contribution to the fund.

³⁰ The eligibility of this action and the figures used have been set down after consultations with SIK, The Swedish Institute for Food and Biotechnology and with KTH, The Royal Institute of Technology, division of Environmental Strategies Research.

Actions that may entitle to support

1) *Description of action:* Encouraging the use of circulating plastic boxes/ crates.

Justification: Reduction of waste material

Commitment: Using the plastic crates

Eligible costs: Costs for cleaning, collecting, sorting and/or the transport of the plastic boxes/ crates. Investment costs for steam cleaning equipment for plastic boxes/ crates and the specific, extra cost for using eco-labelled detergent in the cleaning of boxes.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

2) *Description of action:* Encouraging increased use of plastic materials made of renewable raw materials instead of petroleum based materials.

Justification: Increased use of plastic materials made from renewable raw materials.

Commitment: Use of the more environmental friendly plastic material instead of petroleum-based plastic materials.

Eligible costs: Specific extra costs for plastic materials, in production and in consumer packages, made from at least 50 % renewable raw materials. Costs are eligible only when the alternative that is replaced is a petroleum-based material.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

3) *Description of action:* Increased use of consumer packages with a lower energy consumption

Justification: Reduction of greenhouse gases emissions

Commitment: Using the consumer packages with low energy consumption

Eligible costs: Specific extra costs for consumer packages with at least 20 % lower energy consumption (based on life cycle) than the package it replaces.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

4) *Description of action:* Compressing cardboard boxes.

Justification: Increased recycling of cardboard material

Commitment: Contract with authorized recycling installation

Eligible costs: Cost for investment in cardboard compression equipment.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

(g) Encouraging conversion to organic production

A grower who chooses to convert a part of his or her production will need to invest in extra equipment as equipment for fertilizers, harvesting and sorting need to be separate for organic production and conventional production. This is particularly true for greenhouse growers, since the organically grown products must be kept separate from the conventionally grown ones. Investments may concern extra fertilizer mixers/injectors and separate sorting equipment. It is thus logical to provide support for investment costs to make partial conversion possible.

Costs for consultancy services, training, certification and loss of income in relation to organic production are supported under the Rural Development Program.

Actions that may entitle to support

Description of action: Separate equipment for partial conversion to organic production.

Justification: Supporting conversion to organic production.

Commitment: Conversion to organic production for a part of the cultivated area.

Eligible costs: Cost for investment in separate equipment for fertilizers, harvesting, sorting, washing and packaging.

(i) Encouraging use of organic waste

Production of fruit and vegetables produces considerable amounts of organic waste. These may create negative effects on the environment if not taken care of appropriately. On the other hand, they may contribute positively to production and maintenance of soil structure if used well. Investments in equipment for converting organic waste to compost should therefore be eligible for aid.

Actions that may entitle to support

Description of action: Conversion of organic waste into compost.

Justification: Reduce environmental impact of organic waste.

Commitment: Raw material for compost made should at least to 50 % come from members. In addition, the compost made must be used by members or sold.

Eligible costs: Cost for investment in compost making equipment.

Related costs for consultation services, qualified personnel, study trips and training are eligible under section 9.7., general measures.

Output indicators

- Number of holdings participating in the actions (compulsory)
- Number of actions undertaken (compulsory)
- Total value of investments (where relevant)
- Area or quantity comprised by environmental measures (where relevant)

Result indicators

- Estimated change in total mineral fertilizer consumption per hectare by type of fertilizer (N and P) (tons)
- Estimated change in total consumption of plant protection products by type of compound (Quantity used per ha or per m² for each crop)
- Estimated change in total consumption of herbicides by type of compound (quantity used per ha or per m² for each crop)
- Estimated change in total use of energy, by type of energy source or type of fuel or by CO₂-emissions
- Estimated change in used quantity of oil and coal, respectively
- Fuel quantity used (or discharge of carbon dioxide equivalent in kilos) related to the quantity of products released on the market
- Estimated change in volume of waste generated.
- Estimated change in annual use of packaging (tons)
- Share of IP products
- Share of organic products

9.7 Strategy and measures – General measures on training and advisory services

In this section measures of a more general nature are collected. They may not in themselves generate a quantifiable improvement for the environment or quality but may do so in connection with other measures. *A basic requirement is therefore that these costs are eligible only in connection with measures under other titles.*

Measures of a more general nature include

- Training
- Advice/ consultancy support
- Technical assistance
- Study trips
- Life cycle analyses
- Market surveys
- Energy and fuel audits
- Production planning
- Risk analysis

A description of the action must be provided, in order to specify that, for eligibility of support, the following requirements must be met concerning technical assistance, advice and training, water, soil, leaf and fruit analyses, life cycle analyses, market surveys and energy and fuel audits:

- a) The action is intended to complement (i.e. accompany and be associated with) other actions included in the National Strategy, which must therefore be included in the Operational Programme, and is specifically targeted to reinforce the effects of these actions. The actions concerned must be specified.
- b) The (technical assistance, advice, training, life cycle analysis) activities must be entrusted to additional (internal or external) qualified personnel.

- c) The Operational Programme must indicate the specific tasks that the additional qualified personnel are required to perform.

Concerning “study trips” the action must be intended to complement (i.e. accompany and be associated with) other actions included in the National Strategy, which must therefore be included in the Operational Programme, and are specifically targeted to reinforce the effects of these actions. The actions concerned must be specified.

Actions that may entitle to support

1) *Description of action:* Training

Justification: Improved skill and level of knowledge for producers and staff.

Commitment: Respect of points (a), (b) and (c) outlined above.

Eligible costs: Costs for courses and for travel and food in line with § 14 in Chapter 3 of Swedish regulation SJVFS 2008:32. Compensation for time or loss of income is not eligible.

2) *Description of action:* Advice and consultancy support

Justification: Improved production and reduced environmental impact of production. Improved product quality and improved marketing.

Commitment: Respect of points (a), (b) and (c) outlined above and of § 15 in Chapter 3, of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge and costs for travel, food and accommodation for advisors and consultants.

3) *Description of action:* Technical assistance.

Justification: Improved production and reduced environmental impact of production.

Commitment: Respect of points (a), (b) and (c) outlined above and of § 15 in Chapter 3, of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge and costs for travel, food and accommodation for technical assistance.

4) *Description of action:* Study trips

Justification: Improved production techniques and post-harvest handling and reduced environmental impact of production.

Commitment: Respect of point (a) outlined above.

Eligible costs: Costs for entrance fees to exhibitions and similar events, and for travel and food in line with Chapter 3, § 14 of Swedish regulation SJVFS 2008:32. Compensation for time or loss of income is not eligible.

5) *Description of action:* Life cycle analyses

Justification: Provide information for decisions reducing environmental impact.

Commitment: Respect of points (a), (b) and (c) outlined above and in Chapter 3, § 15 of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge, charge for analyses and costs for travel, food and accommodation for the qualified personnel.

6) *Description of action:* Market surveys.

Justification: Enable better positioning and niching on the market.

Commitment: Respect of points (a), (b) and (c) outlined above and Chapter 3, § 15 of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge for qualified personnel and costs for travel, food and accommodation for the qualified personnel.

7) *Description of action:* Energy and fuel audits

Justification: Identify possible areas for improvement in relation to heating of greenhouses and storage-, distribution- and other production related facilities and of vehicle fuel consumption.

Commitment: Respect of points (a), (b) and (c) outlined above and Chapter 3, § 15 of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge for qualified personnel and costs for travel, food and accommodation for the qualified personnel.

8) *Description of action:* New and improved tools for production planning

Justification: Ensuring optimal planning of production.

Commitment: Respect of points (a), (b) and (c) outlined above and Chapter 3, § 15 of Swedish regulation SJVFS 2008:32.

Eligible costs: Hourly charge for qualified personnel and costs for travel, food and accommodation for the qualified personnel.

10. Requirements that apply to all or several measures and relationship with Rural Development Programme.

10.1. General requirements

All measures and activities must meet the rules and requirements laid down in Regulations (EC) No 1234/2007 and (EC) No 1580/2007 and in Swedish Regulation (SJVFS) 2008:32.

10.2 Collective character

The support to Producer Organisations goes to a group of producers that have chosen to cooperate. In other words, it is not support to individual member companies. Operational Programmes must have a clear collective character with clear collective goals. Measures not comprised by collective goals do not entitle to support.

The legislation nevertheless offers certain possibilities of supporting investments located at individual companies. Since this is an exception to a basic rule, certain requirements need to be fulfilled in order for investments financed through the PO scheme to be located at individual member companies:

- The Operational Programme must provide a reason why the investment has been located at the member company instead of in a common central building.
- The PO must be able to show that the investment can be used by several member companies. Investments that clearly can only be used by one single company are accepted, however, like investments in thermal screens and heaters.
- The investment must be a part of a collective programme. This means that the measure shall be a part of a programme that comprises several producers and that has a clear, collective goal.
- Investments located at individual member companies shall be owned by the Producer Organisation and thus be included in their inventory.

10.3 Conventional plastics and general environmental requirements

Article 103 (c) (5) of Council Regulation (EC) No 1234/2007 stipulates that investments that increase environmental pressure shall only be eligible for support in case effective safeguards to protect the environment from these pressures are in place.

Therefore, no measures involving conventional petroleum plastic materials shall be eligible for support in Sweden. Plastic ground covers in field production, the use of plastic materials in greenhouse production, and plastic tunnels to extend the production season shall not be eligible for support. Specific costs (extra cost) for plastic materials made of at least 50 % renewable raw material shall however be eligible for support³¹ when used.

³¹ "Specific cost" means the cost for the plastic material produced from at least 50 % renewable raw materials minus the cost for a comparable conventional petroleum-based plastic material.

10.4 Personnel costs

Eligible personnel costs are limited to 450 SEK/hour including social costs. The limit applies also to personnel costs outsourced according to Article 29 of Commission Regulation (EC) No 1580/2007. It does not apply to costs for external consultants on production, environment, IT technology and energy.

10.5 Relationship with the Rural Development Programme

The following section recaptures the conditions set out in the Rural Development Programme, section 5.2.3. which deals with criteria and administrative rules concerning exceptions referred to in Article 5.6. of Council Regulation (EC) No 1698/2005 and mentioned in article 2.2. of Commission Regulation (EC) No 1974/2006.

The primary rule laid down in relevant EU-regulations is that no support is payable for schemes eligible for support under common market organisations. Support, however, may be extended to recognise Producer Organisations in the common market organisation for fruit, berries and vegetables. Thus, according to the primary rule, where support for investment, skills acquisition and other measures can be applied for under common market organisations, farmers/enterprises are not eligible for support within the framework of the Rural Development Programme.

Owing to the geographical and economic conditions prevailing in Sweden, it is not always practicable for farmers/enterprises to combine and carry on activities in Producer Organisations. Exceptions to the rule are therefore considered necessary, primarily with regard to the application for investment support to agricultural holdings, carry over aid and support for skills acquisition. Other types of support within the framework of the Rural Development Programme should also be considered. Such exceptions are necessary if support for enterprises in the sector is not to distort competition by placing enterprises, which are not members of a Producer Organisation at a disadvantage.

Freestanding farmers or enterprises may have access to support within the framework of the Rural Development Programme, including investment aid of a kind that can be supported by Producer Organisations. On the contrary, farmers or enterprises, which are members of a Producer Organisation in the fruit and vegetable sector, may only be granted support for an action not supported by the Operational Programme of the Producer Organisation.

11. Description of competent authorities and relevant bodies

In Sweden, the Board of Agriculture is responsible for distribution and control of support to Producer Organisations in the fruit and vegetable sector. The following of the Board's divisions are involved in this work:

- The Division for Trade and Markets works with EU legislation (discussions regarding the design of the legislation, interpretation, information, etc.) as well as design of national rules. The division is also responsible for drawing up the National Strategy and the Framework for environmental measures that entitle to support.
- The Division for Market Support works with recognizing Producer Organisations, approving Operational Programmes and measures, as well as with support payments.
- The Inspection and Control Division works with control issues related to the value of the quantities released on the market, Operational Programmes, and approved measures.

12. Description of monitoring and evaluation systems

12.1 Evaluation of the Operational Programmes and the Producer

Organisations' obligation to report

The Market Support Division is responsible for evaluating Operational Programmes. As regards the question of whether or not the Operational Programmes agree with the National Strategy, this is decided jointly by the Market Support Division and the Trade and Markets Division.

12.2 Administration of measures eligible for support in both the Rural Development Programme and in the PO scheme

A number of measures listed as eligible in the National Strategy for support to producer organisations in fruit and vegetables are also eligible for support within the Rural Development Programme. A majority of these relate to the environment and some to quality.

Environmental measures are deemed so important to the programme that the fact that they are entitled to support within the Rural Development Programme does not exclude them from the support to PO's in fruit and vegetables. Instead, a close cooperation is set in place between the divisions (of the Board of Agriculture) handling the two aid schemes. No payment of support shall be made without a confirmation from the other division that there is no case of double financing.

In addition, all individual members of Producer Organisations shall make a written commitment not to receive support for the same measure from more than one aid scheme. If someone applies for support for the same measure or for related measures from more than one aid scheme (both EU and national), this shall be clearly stated in the applications.

12.2.1. Criteria and administrative rules in the National Strategy for avoiding double financing.

- The Market Support Division at the Board of Agriculture receives all applications for support.
- The supporting documents must show that the application is in line with the Producer Organisations Operational Programme.
- The competent authority sets aside any applications that could entail a risk of double funding.
- In cases of set aside for entailing a risk of double funding, a draft decision is sent to the Rural Support Division before any of such applications are selected and approved.
- Once the Market Support Division has completed its verification and eliminated any risk of double community financing, the delivery body duly grants support.
- When the project has been implemented and the investment paid, the competent authority conducts administrative checks and field inspections in accordance with the relevant EU regulations. These verification procedures include checks to ensure that no double community financing takes place. Similar procedures are also followed in the case of projects receiving support under the Rural Development Programme.

12.2.2. Criteria and administrative rules in the Rural Development Programme for avoiding double financing in article 5.6 of Council Regulation (EC) No 1698/2005.

To ensure that double community financing does not occur with the respect of the measures in the fruit, soft fruit and vegetable sector in the Rural Development Programme, the competent authority will apply the following verifications procedures.

The Market Support division in the Board of Agriculture is responsible for matters relating to support for Producer Organisations under Council Regulation (EC) No 1234/2007 of 22 October 2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation) (OJ L 299, 16.11.2007, p. 1).

- The competent authority receives all applications for support. The supporting documents must show that the application relates to activities involving primary producers in the fruit, soft fruit and vegetable sector and whether the latter are members of a Producer Organisation. The competent authority sets aside any applications that could entail a risk of double funding.
- In each case, a draft decision is sent to the Market Support division before any of such applications are selected and approved. To verify that the investment in question has not been granted support through a Producer Organisation, the Market Support division conducts a verification check.
- After the competent authority and the Market support division have completed their verification and eliminated any risk of double community financing, the delivery body duly grants support.
- When the project has been implemented and the investment is paid, the competent authority conducts administrative checks and on the spot inspections in accordance with the relevant EU regulations. These verification procedures include checks to ensure that no double community financing takes place. Similar procedure are also followed in the case of projects receiving support under the common market organisations.

12.3. Surveillance and evaluation of the national strategy

The Internal Audit Division of the Board of Agriculture has the responsibility for surveillance and evaluation of the National Strategy.