THE WEST OF SCOTLAND AGRICULTURAL COLLEGE

HORTICULTURE IN SCOTLAND

An economic review of the present state
of the industry and the prospects
for the future.

by

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SUMMARY

The present situation

Horticultural output in Scotland is worth £13.7 million and represents 4% of the total value of Agricultural and Horticultural output. A wide range of crops is grown, the most important being raspberries and tomatoes which together account for almost 30% of the output. Apart from the crops grown for processing, production tends to be on a small scale and apart from carrots, cabbage and raspberries, is insufficient to meet the needs of the home market. The deficit is made up by imports from the rest of the United Kingdom and from abroad.

Traditionally, edible horticultural crops for the fresh market have been sold through the wholesale markets. Because of the interdependence between producers and processors, crops grown for processing are normally grown under contract. Non-edible crops, particularly nursery stock, are sold by mail order, through retail outlets and more recently through specialised garden centres.

Consumption of horticultural crops in Scotland is low, with the consumption of fresh green vegetables being less than 40% of the United Kingdom average.

Future Developments

Edible crops for the fresh market

The marketing and distribution of edible crops for the fresh market is being increasingly dominated by the supermarkets and multiples. The need by these shops for a large volume of evenly graded produce of a guaranteed quality has resulted in significant changes in the marketing and distribution of horticultural crops with the formation of unified supply organisations. These organisations supply produce to meet the requirements of supermarkets and chain stores.

Because of the small scale of production in Scotland, local producers have been unable to supply produce to meet the needs of these supply organisations who have therefore tended to buy directly from importers. This has resulted in a decline in the importance of the wholesale market. With the increasing importance of supermarkets and chain stores at the expense of independent retailers, Scottish producers must attempt to sell through these outlets if the industry is to maintain or increase its share of the market. This will require an awareness by the industry of changes in the markets' requirements.

Edible crops - processing

The demand for processed fruit and vegetables (particularly frozen and "boil in the bag") is likely to increase. This will in turn lead to an expansion of the acreage of crops grown under contract to processors. The problem facing Scottish producers is that the expansion of processing capacity may not take place in Scotland but could occur anywhere in the United Kingdom or even in the E.E.C. Every encouragement must therefore be given by producers to the processors to site new factories or expand existing factories in Scotland.

One alternative is for Scottish producers to operate processing factories themselves in order to benefit from the increasing size of the market. Some progress has been made in this direction in the East of Scotland but such developments require a substantial capital investment by producers plus a high level of management and marketing skills.

Non-edible crops

The development of garden centres, following the progress made by the containerisation and the container growing of trees and shrubs, has resulted in a radical change in the marketing and distribution of these crops which in turn is leading to a rise in consumption. This may or may not be reflected in increased production in Scotland, depending on the relationship that develops between producers and retailers.

The use of trees and shrubs by local authorities and nationalised industries has also expanded but again because of the small scale production in Scotland, orders have been filled by large nurseries in England and by producers in Europe. A change in marketing and distribution methods by producers will be necessary if a greater share of this market is to be obtained.

The sale of cut flowers and pot plants is restricted by low consumption and by a decline in the number of outlets selling these products. The future of this sector will depend on producers being able to increase the number of outlets either by making the products easier to handle. by supermarkets or by developing new retail outlets (i.e. flower boutiques).

Recommendations

To take advantage of these opportunities and to improve the present level of competitiveness within the industry, recommendations are made as follows.

1. To improve the marketing and distribution of horticultural produce, opportunities for training at graduate and post graduate levels should be made available.

2. Until a pool of expertise becomes available from within the industry, the industry must be prepared to buy appropriate expertise from outside horticulture.

3. To provide those within the industry with information on retailer and consumer needs, a co-ordinated research programme should be undertaken into the retailing and consumption of horticultural products.

4. Edible crops - (processing)

   a) Continued research into new methods of freezing soft fruit is needed so that new products can be introduced to replace the decline in the use of soft fruit for jam manufacture.

   b) To take advantage of the increasing consumption of convenience foods, attempts should be made to increase the range of crops that can be sold ready to use either quick frozen or "boil in the bag".

c) Action should be taken by producers to ensure that expansion of processing capacity occurs in Scotland.

5. Edible crops - (fresh)

Continued encouragement should be given to the setting up of co-operative marketing schemes to ensure that local producers can compete with imports from other countries.

6. Flowers and pot plants

An investigation into the prepacking of flowers and into the feasibility of producers setting up their own retail outlets should be undertaken.

7. Shrubs

An investigation of possible methods of improving the links between producers and retailers should be undertaken.

8. Research directory

To help increase the speed with which research and development findings are applied by the industry, a research directory summarising the work being done by the various research institutions in Scotland, involving horticultural products, should be published. Where relevant, work being done in other countries should be included.

INTRODUCTION

The objective of this review of the horticultural industry is to examine the present state of the industry in Scotland in order to pinpoint particular areas of strength and weakness, of flexibility and rigidity and possible areas of future development. This type of review presents a number of difficulties, particularly when attempting to take a broad view of an industry in which a variety of production methods are used to produce a wide range of crop. In fact it is difficult to define exactly what is meant by "horticulture". In the past this term was applied to fruit, vegetable and flower crops requiring a high level of labour input. With increased mechanisation, this definition is no longer valid and a number of horticultural crops are now grown on a scale more traditionally associated with agriculture. To avoid confusion this review is concerned with those horticultural crops for which the Department of Agriculture publish output estimates.*

The review covers four main areas dealing firstly with the resources used in horticultural production. It then goes on to examine the present trends in the output of Scottish horticulture, the marketing of horticultural crops and finally the consumption of horticultural products.

The review is basically concerned with Scotland but where relevant comparative figures from other production centres have been included to show the relative advantages and disadvantages of the Scottish situation.

* Vegetables:- peas, cabbage, cauliflower, brussel sprouts, carrots, lettuce, leeks, tomatoes, mushrooms, etc.

Fruit:- orchard and soft fruit.

Flowers:- plants and bulbs

SECTION 1 - RESOURCES USED AND PRODUCTIVITY

i) LAND

Of the total area of Agricultural land over 70% is occupied by rough grazing. A further 17% is used for the production of grass and 9% for the production of various crops such as cereals, potatoes etc. Only 0.2% of the total area is used for the production of horticultural crops although the value of these crops account for 4% of the total value of agricultural output* in Scotland. The largest area of horticultural crops is situated in the East Central region.

TABLE 1.1.

Land use - acreage in June 1972

Region**	Rough Grazing	Grass	Horticultural Crops	Other Crops	Total Agricultural Land
	000 Acres				
Highland	6,571	251	1	91	6,913
North East	972	744	4	456	2,175
East Central	1,332	382	16	399	2,128
South East	666	362	6	284	1,318
South West	1,599	975	2	191	2,767
SCOTLAND	11,140	2,714	29	1,421	15,301

Source: Scottish Agricultural Statistics.

Location of horticultural production

Because of differences in climate, soil type and other factors such as distance to markets and availability of labour, the production of horticultural crops varies considerably in different areas. Soft fruit production is concentrated in the East Central region. Vegetable production is more dispersed with East Central and South East Scotland being equally important. The North East region is the centre of the nursery stock production. Glasshouse production is concentrated in the South West, particularly in the Clyde Valley.

* Source: Scottish Agricultural Economics Vol. XXIII

** For definition of the regions see Appendix V

TABLE 1.2

Location of horticultural crops - June 1972

		Highlands	North East	East Central	South East	South West	Scotland
Soft Fruit	acres	366	765	9306	406	516	11359
	%	3.2	6.7	81.9	3.6	4.5	100
Vegetables	acres	155	1892	5716	5716	1006	14486
	%	1.2	13.1	39.4	39.4	6.9	100
Nursery Stock	acres	13	497	235	161	142	1048
	%	1.2	47.4	22.5	15.4	13.5	100

Source: Agricultural Statistics (Scotland)

Because of the tremendous range in the value of crops produced per acre, the location of horticultural crops purely on an acreage basis is misleading. For example, raspberry production occupies some 8,000 acres whereas tomato production occupies only 200 acres but in terms of value the output from tomatoes (£2.2 million) is greater than that of raspberries (£1.8 million).* In terms of value, the East Central, South East and South West regions all make a significant contribution to the total value of horticultural production. (see Table 1.3 and Fig. 1.1).

TABLE 1.3

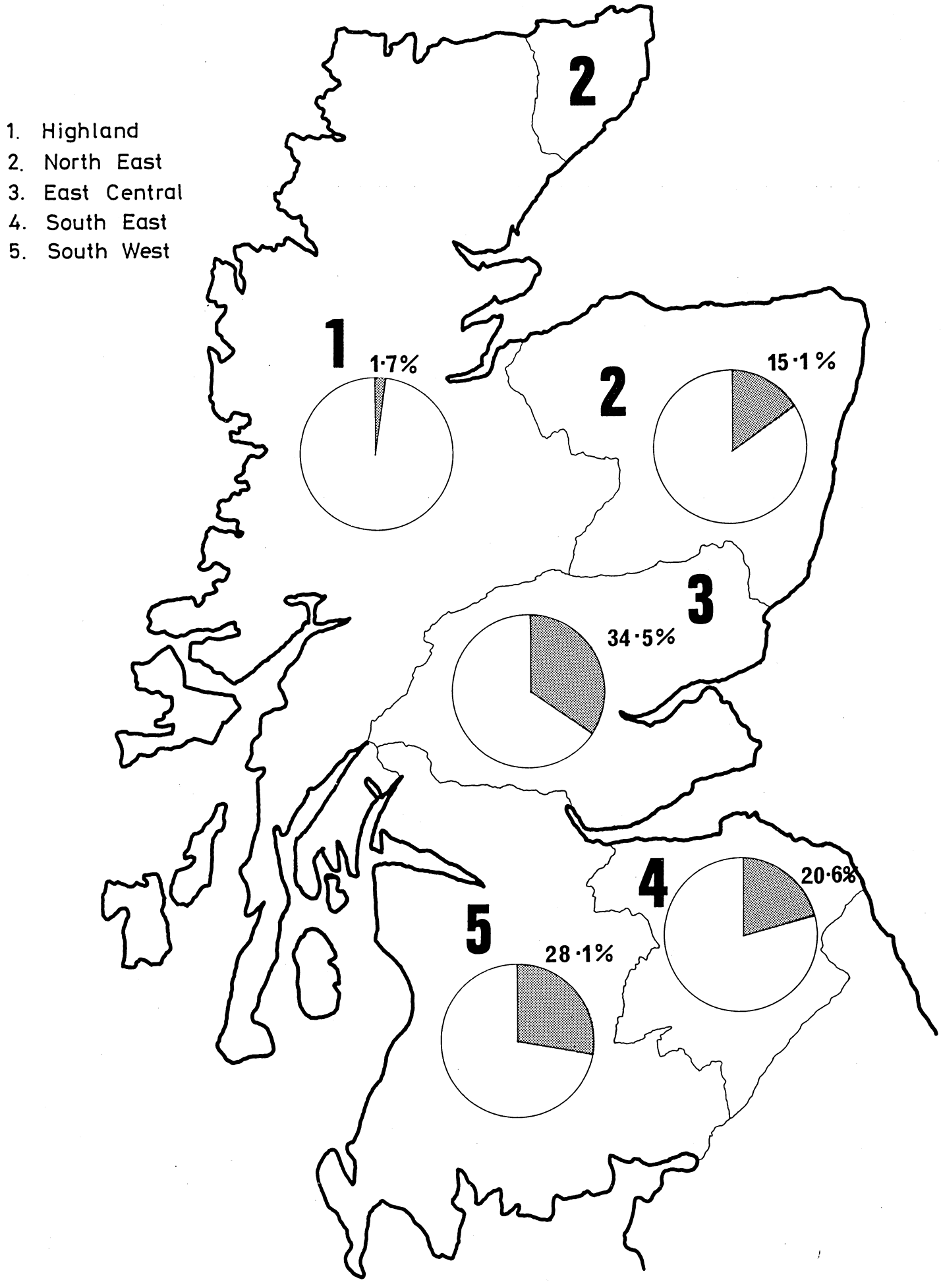
Estimated regional value of horticultural production

	Highlands	North East	East Central	South East	South West	Total
	£000's					
Vegetables (exl. production under glass)	40.8	341.1	901.8	1777.6	594.1	3655.4
Production under glass	14.6	102.2	305.9	205.6	2205.4	2833.7
Soft Fruit	69.4	146.0	1894.4	82.4	67.6	2259.8
Flowers & Plants	61.8	1103.4	763.8	254.6	289.2	2472.8
TOTAL	186.6	1692.7	3865.9	2320.2	3156.3	11221.7

Sources: Estimates based on data from Scottish Agricultural Economics Vol. XXII
Agricultural Statistics - Scotland
Management Handbook - Horticulture WSAC

* Scottish Agricultural Economics Vol. XXIII - Forecast for 1972-73.

Fig 1.1 **REGIONAL VALUE OF HORTICULTURAL PRODUCTION**



Structure of horticultural production

The wide range of crops grown presents difficulties in making meaningful comparisons of the size structure of horticulture as a whole. It is difficult, for example, to compare the size structure of the glasshouse industry with the production of vegetables out of doors. However within each sector, the size structure does have a very important bearing on the competitiveness of that sector. Detailed figures on the size structure of glasshouse, raspberry, strawberry and vegetable production units are given in Appendix I. These figures show:

1. Almost 70% of the glasshouse units are less the ¼ acre in size and yet these units account for only 20% of the total acreage of glass. Half the acreage of glass is on units of between ¼ and 1 acre in size.

2. Production of raspberries is dominated by a small number of large producers, less than 10% of growers controlling over half the total acreage. These larger growers are situated in the East Central Region (particularly in Perth and Angus) near to the processing factories. The smaller producers are concentrated in the South East and West regions, near to the population centres.

3. Production of strawberries tends to be on a smaller scale than production of raspberries, possibly because a higher proportion of the crop is sold for the fresh market. Again, the larger units are situated in the East Central Region, whilst the smaller units occur in the South East and West regions.

4. The production of peas for processing is a highly mechanised operation and therefore the size of production units is normally large to justify the investment required. This is reflected in the size structure where almost 90% of the crop is in units of over 30 acres.

The Scottish climate

Climate is a particularly important factor in the location and successful development of horticultural production. The interaction of temperature, rainfall and the number of hours of bright sunshine can result in climatic conditions giving a region a real advantage in the production of a crop. To a certain extent, adverse weather conditions can be offset by the use of protective structures although this normally involves heavy capital expenditure. The recent introduction of cheap polythene houses into Scotland on a wide scale is an important development in offsetting unfavourable climatic conditions whilst limiting the capital investment involved. The use of these polythene houses is likely to have a significant effect on the production of horticultural crops in this country.

1) Temperature

The prevailing temperature influences both the range of crops that can be grown and the seasonality of production and is a major determinant in the cost of cropping under glass. The average temperature in Scotland ranges from 46°F in the far North to 49°F on the Mull of Galloway. This compares with 49°/50°F for the Midland and Southern areas of England and 51°F - 52°F if in Devon and Cornwall.

More critical than the average temperature, is the mean monthly temperature in the spring. This dictates the earliness of Scottish production and the cost of fuel for production under glass.

TABLE 1.4

Mean Monthly Temperatures in Scotland, England and Holland (^{o}C)

	Jan.	Feb.	March	April	May	June	July
Scotland							
Perth	2.4	3.2	5.1	7.7	10.6	13.6	15.3
Kilmarnock	3.2	3.8	5.7	7.8	10.8	13.6	14.9
England							
Worthing	4.5	4.5	6.4	9.0	12.1	15.2	16.9
Lea Valley	3.9	4.3	6.4	9.2	12.4	15.6	17.6
Holland							
Naaldwijk	2.8	3.2	5.8	9.0	13.4	16.1	18.2

Source: Meteorological Office H.M.S.O.

Comparing the figures for Kilmarnock with those for Holland, the temperature in January and February is higher in Scotland and there is little difference between the temperatures in March indicating a climatic advantage to Southern Scotland in terms of earliness of crops and a lower heating requirement for production under glass. The lower temperatures in Scotland compared to both Worthing and the Lea Valley mean later crops and a higher heating requirement for production under glass for Scottish producers compared to their English competitors.

2) Monthly hours of bright Sunshine

The growth of crops in the spring, particularly under glass is to a large extent determined by the amount of light the crops receive. Comparing the numbers of hours of bright sunshine received in Scotland, England and Holland during the spring, Scotland is at a disadvantage to both the South Coast of England and Holland (see Table 1.5)

TABLE 1.5

Monthly hours bright Sunshine in Scotland, England and Holland

	Dec.	Jan.	Feb.	Total Dec.- Feb.	March	April	May	Total Mar.- May
Scotland								
Perth	31	41	74	146	100	147	180	427
Kilmarnock	30	43	67	140	102	146	203	451
England								
Worthing	62	68	81	211	147	181	232	560
Lea Valley	42	33	63	138	114	144	189	447
Holland								
Westland	38	50	75	163	128	171	231	530

3) Rainfall

Rainfall is the third critical factor determining the climatic advantage or disadvantage of a region. The cost of overcoming a shortage of water can be considerable and with water resources becoming more scarce, the amount and distribution of rainfall throughout the year is likely to become an increasingly important factor in the location of crops.

In Scotland there is a considerable variation in rainfall from the drier East Coast to the wetter Western coastal areas (see Fig. 1.2) (For other information on the Scottish climate see Figs 1.3, 1.4 and 1.5).

Fig 1.2 **AVERAGE ANNUAL RAINFALL**

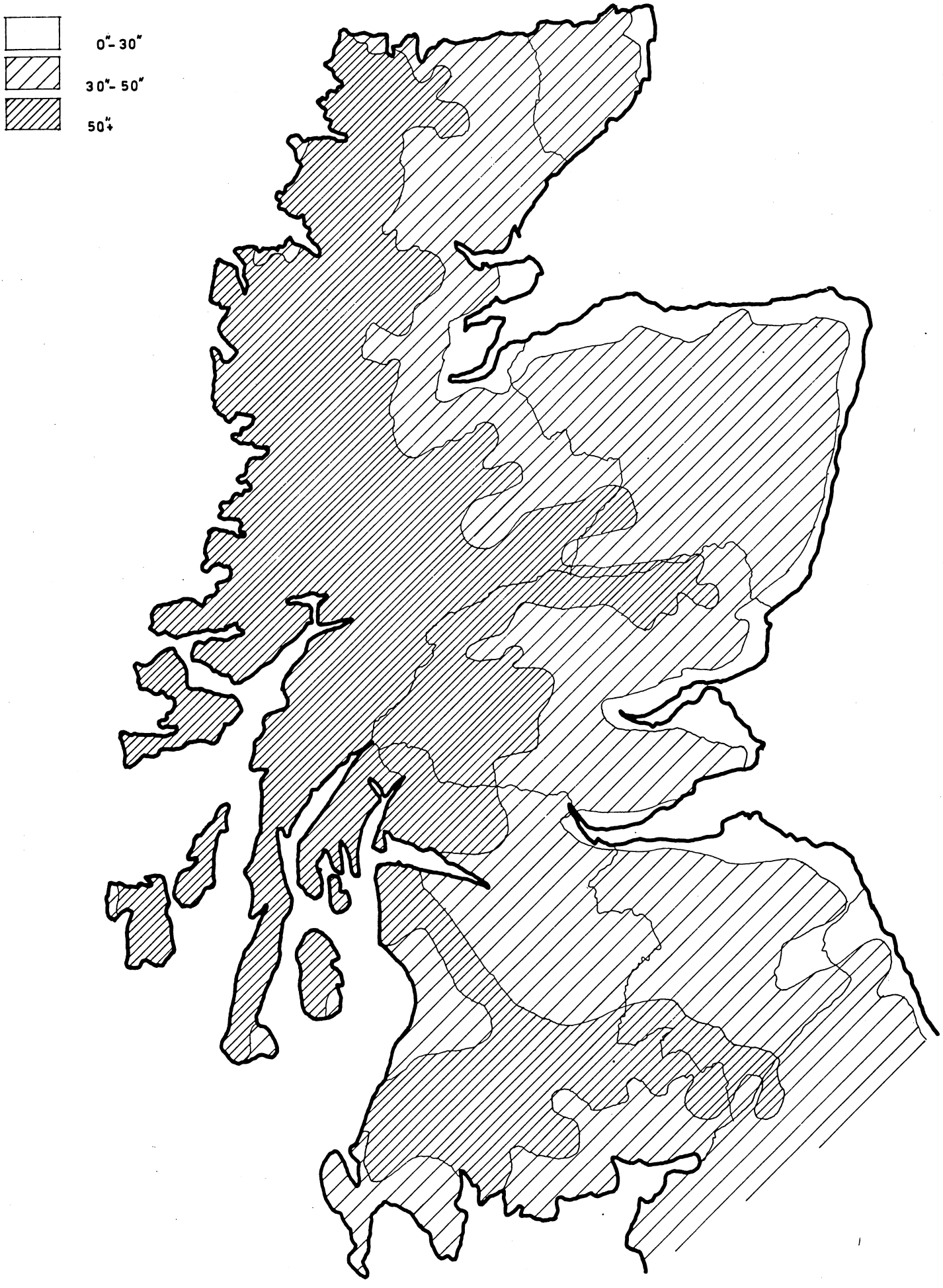


Fig. 1.3

AVERAGE MEANS OF DAILY DURATION OF BRIGHT SUNSHINE

Fig 1.4
AVERAGE LENGTH OF FROST FREE PERIODS

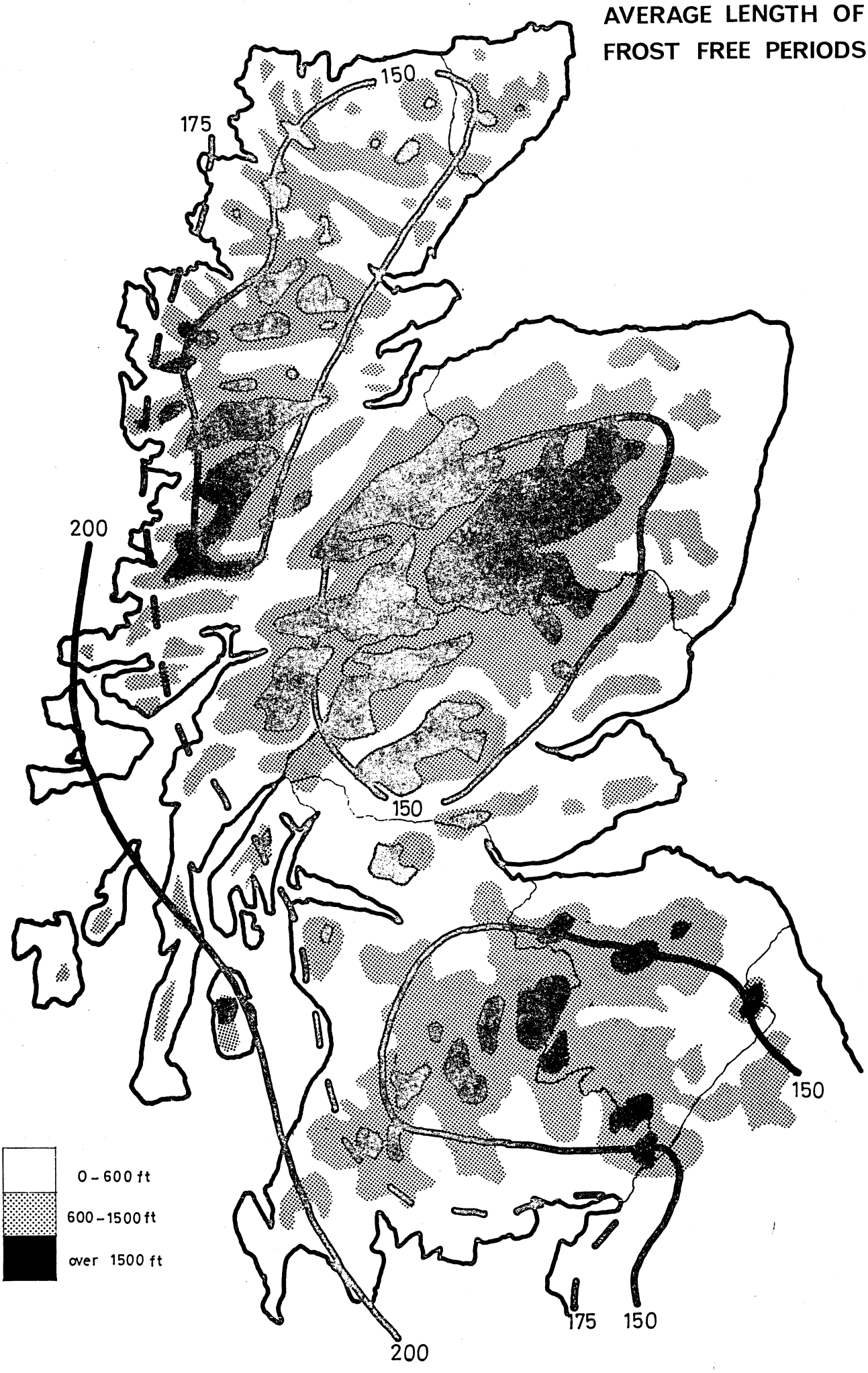


Fig 1.5

AVERAGE MEANS OF DAILY MEAN TEMPERATURE

ii) LABOUR

The second resource used in production is labour. In 1972, 1,732 full time and 1,165 part-time workers were employed in Scottish horticulture.

TABLE 1.6

Numbers employed in horticulture and agriculture in Scotland

	Horticulture[1]			Agriculture	
	full time	part-time	casual	full time	part-time
1962	2,946	715	700	62,169	7,128
1968	1,670	483	712	40,544	4,987
1969	1,684	443	673	38,517	5,424
*1970	2,008	526	684	38,056	5,245
1971	1,749	492	703	37,159	5,327
1972	1,732	479	686	36,900	5,244

Source: Department of Agriculture and Fisheries for Scotland.

[1]Specialist horticultural holdings only.

* A change in approach to the collection of labour numbers led to the more complete enumeration of workers. This makes a complete comparison of the figures impossible.

Between 1962 and 1969 the number of full time workers employed in horticulture fell at an annual rate of 6% compared to a rate of 5.4% for the whole of agriculture. Between 1970 and 1972, the rate of decline increased to 6.9% per annum although for agriculture as a whole the rate of decline decreased considerably.

The number of part-time and casual workers also fell but at a slower rate so that by 1972 the industry was relatively more dependent on part-time labour than in earlier years. For example in 1962, in terms of numbers, 32% of the labour force was employed on a casual basis compared to 40% in 1972. This dependency of horticulture on part-time labour makes it particularly vulnerable to changes in the overall employment situation, leading to recruitment problems at periods of high regional employment. Also, many of these casual workers are female and with present Government policy aimed at equal pay for women within a relatively short period, this could lead to a disproportionately large rise in labour costs in horticulture compared to other industries.

TABLE 1.7

Age Structure of the labour force (full time males) employed in Horticulture, Agriculture and other occupations - 1972

Age group yrs.	Horticulture	Agriculture	Active pop. of Scotland
	%	%	%
Less than 35	42.6	43.3	41.0
35-44	18.6	21.5	20.0
45-64	34.8	31.8	36.0
65+	4.0	3.4	3.0
Total	100.0	100.0	100.0

Source: Department of Agriculture and Fisheries for Scotland.

There appears to be little difference between the age structures of horticultural workers, agricultural workers and all other occupations in Scotland.

iii) CAPITAL

The third and final resource required for production is capital. Unfortunately information on the capital employed in Scottish Horticulture is not readily available. However, an attempt has been made to calculate the capital employed but it must be emphasised that this is a rough estimate only.

TABLE 1.8

Capital Invested in Scottish Horticulture at 31st December, 1972

			£000s
Land and buildings	28,900 acres @ £200 per acre[1]		5,780
Equipment			
Glasshouses (incl. irrigation, heating etc.)	1966	203 acres @ £4,000 per acre	812
	1966-1969	38 acres @ £10,000 per acre	380
	1969-1972	30 acres @ £15,000 per acre[2]	450
Other Equipment		1400 units @ £450 per unit[3]	630
Growing Crops			
Raspberries	7800 acres @ £200[4] per acre		1,560
Strawberries	2000 acres @ £160[4] per acre		320
Bulbs for forcing	output £400,000 less 15%[5]		340
Other crops	estimate 15% output[6]		1,300
Working Capital			
Store	6.6%		531
Sundry Debtors	2.4%	of fixed assets	193
Cash	2.1%		169
			12,465

[1] Based on value of sales of farm land for Cropping farms. S.A.E. Vol. XXIII. (This is liable to be an underestimate because of the recent steep rise in the price of land).

[2] Estimated acreage of glass built since 1969.

[3] Number of intensive holdings in Scotland - Agricultural Statistics 1970. Value per unit based on West College financial sample of 20 Horticultural Accounts.

[4] Based on Establishment cost - Soft Fruit - Agriculture E.D.C.

[5] Value of growing crop in December at market value less 15%.

[6] Value of other growing crops based on 15% of output.

[7] Working capital based on the ratio of working capital to fixed assets for cropping farms. S.A.E. Vol. XXIII.

This estimate of capital employed in Scottish Horticulture of £12.5 million can be compared to the estimated capital investment in Scottish Agriculture of £1,470 million.*

Capital input in Scottish Horticulture

Capital investment in Scottish Horticulture has been encouraged by the provision of grant aid. The uptake of these grants gives some indication of the level of investment in horticulture.**

TABLE 1.9

Cost of schemes approved under Horticulture Improvement Scheme

Year	Actual Cost	Cost at 1965 prices
1965	138,318	-
1966	216,460	208,083
1967	290,722	272,697
1968	519,000	465,024
1969	478,149	404,753
1970	639,936	518,220
1971	653,491	482,145
1972	891,335	616,782

Source: Agriculture in Scotland. D.A.F.S.

The increased rate of investment in 1972 and into 1973 was the result of the industry anticipating the end of the Horticultural Improvement Scheme (scheduled for April 1974). However, because of the very high level of grant applications received during the first 6 months of 1973 the scheme was ended prematurely in July 1973 to be replaced by further investment incentives, the details of which are still to be announced.

* Scottish Agriculture and the E.E.C. - S.A.D.C.

** For details of Horticulture Improvement Scheme see Appendix II.

iv) PRODUCTIVITY

The measurement of productivity in Scottish horticulture is particularly difficult owing to the complexity of the industry and the lack of information, particularly with regard to capital investment. However, various measures have been attempted and these are shown in Table 1.10 together with comparative figures for agriculture.

TABLE 1.10

Productivity measures for Scottish Horticulture

Capital	Assets	Output	Output per £1 of assets employed
Horticulture	£12.5m	£11.3m	£0.91
Agriculture	£1,470.0m	£325.6m	£0.22
Labour*	**Labour Cost**	**Output**	**Output per £1 of labour**
Horticulture	£2.0m	£11.4m	£5.70
Agriculture	£46.0m	£325.6m	£7.08

These figures show clearly the labour intensive nature of horticulture compared to agriculture resulting in a lower output per unit of labour in horticulture. Horticulture shows a higher return per unit of capital than agriculture principally because the value of land has been included in the calculation of capital and the intensive use of land is the basic characteristic of horticultural production.

From details of labour employed it is possible to calculate the change in labour productivity.** Between 1962 and 1969 the output of Scottish horticulture increased from £6.19m to £8.29m (at 1962 prices). During that period the number of man hours required to produce the crops fell by over 40% whilst average earnings rose by 59% resulting in an overall decrease in labour costs of 10%. In real terms the output from £1 of labour rose from £3.48 in 1962 to £5.18 in 1969 - an increase of nearly 50%.

* Excluding farmers and growers.

** For methodology see Appendix III.

Because of a change in the basis of collecting information on labour, tbe figures from 1970 onwards cannot be compared with those for the 1960's. However, between 1970 and 1972 the output of Scottish horticulture fell from £12.2m to £11.7m (at 1970 prices). During this period the number of man hours required to produce the crops fell by 12% whilst average earnings rose by 16% resulting in an overall increase in labour costs of 2%. In real terms, the output from £1 of labour fell from £5.90 in 1970 to £5.54 in 1972 - a fall of 6%.

In view of the very steep rise in labour costs, this fall in labour productivity is not surprising but it does tend to emphasise the vulnerability of a labour intensive industry like horticulture to increase labour costs.

SECTION 2 - THE OUTPUT OF SCOTTISH HORTICULTURE

The value of Scottish horticultural production in 1971/1972 was estimated at £11.4 million or 4% of the total value of agricultural output estimated at £280.3 million.

TABLE 2.1

Value of Agricultural and Horticultural Output - Scotland 1971/2 and 1972/3

	1971/1972 Provisional		1972/1973 Forecast	
	£m	per cent	£m	per cent
Farm crops	43.6	15.6	48.5	14.9
Livestock	146.1	52.1	179.8	55.3
Livestock products	77.4	27.6	81.3	25.0
Horticulture	11.4	4.1	13.7	4.2
Sundry output	1.8	0.6	1.9	0.6
Total output	280.3	100.0	325.2	100.0
Sundry receipts, grants etc.	35.5		32.0	
Valuation changes	22.9		32.0	
Gross Output	338.7		389.2	

Source: Scottish Agricultural Economics Vol. XXIII - 1973.

The two most important horticultural crops are raspberries and tomatoes, the value of these two crops representing 30% of the total value of horticultural crops. All the tomatoes are marketed fresh whereas 96% of the raspberry crop is processed.

TABLE 2.2

Product Structure of Scottish Horticulture

	1971/1972 (provisional)		1972/1973 (forecast)	
	value £000	%	value £000	%
FRUIT TOTAL	2,563	22.5	2,715	19.8
Raspberries	1,604	14.1	1,835	13.4
Strawberries	662	5.8	583	4.2
Other	297	2.6	297	2.2
VEGETABLES TOTAL	5,277	46.3	7,034	51.2
Peas	228	2.0	338	2.5
Cabbage	549	4.8	802	5.8
Cauliflower	363	3.2	264	1.9
Brussels Sprouts	198	1.7	320	2.3
Carrots	261	2.3	612	4.5
Lettuce	560	4.9	773	5.6
Leeks	253	2.2	410	3.0
Tomatoes	1,623	14.2	2,238	16.3
Other	1,242	10.9	1,277	9.3
FLOWERS, PLANTS TOTAL	3,554	31.2	3,984	29.0
TOTAL	11,394	100.0	13,733	100.0

Source: Scottish Agricultural Economics Vol. XXIII - 1973

Since 1961 the value of horticultural output has more than doubled. The largest increase has occurred in the value of amenity crops produced (i.e. flowers, plants, nursery stock etc.) and this has resulted in a significant change in the product structure with the value of amenity crops now accounting for almost one third of the total output.

TABLE 2.3

Change in the Product Structure of Scottish Horticulture

	1961-1962		1971-1972 (provisional)		1972-1973 (forecast)	
	value £000s	%	value £000s	%	value £000s	%
Raspberries	868	15.4	1,604	14.1	1,835	13.4
Other fruit	483	8.6	959	8.4	880	6.4
Tomatoes	1,048	18.5	1,623	14.2	2,238	16.3
Other Vegetables	2,441	43.2	3,654	32.1	4,796	34.9
Flowers & Plants	808	14.3	3,554	31.2	3,984	29.0
Total	5,648	100.0	11,394	100.0	13,733	100.0

Source - Scottish Agricultural Economics Vols. XXIII and XIV

i) VEGETABLE CROPS

The output of vegetable crops in Scotland has increased by one quarter since 1961 (in real terms). This increase has been much less than the increase in horticultural production as a whole with the output of vegetables now accounting for only half the total output of horticulture, compared to two thirds in 1961.

TABLE 2.4

Output of Vegetable Crops in Scotland

	Units	1961/62	1965/66	1969/70	1971/72	1972/73
Output						
Vegetable Crops	£000s	3,489	3,476	5,144	5,277	7,034
All Horticulture	£000s	5,648	7,499	10,806	11,394	13,733
Importance of veg. production	%	62%	46%	48%	46%	51%
Vegetable Crops at 1962 prices	£000s	3,489	3,212	4,043	3,562	4,453

Source: Scottish Agricultural Economics

Considerable changes have taken place in the output of individual crops with the output of peas and cabbage declining in importance, whilst the output of carrots and lettuce has increased in importance.

TABLE 2.5

Product Structure of Vegetable Production (by Value)

	1961/62	1965/66	1969/70	1971/72	1972/73
	%	%	%	%	%
Peas	9	5	6	4	5
Carrots	5	4	7	5	9
Lettuce (outdoor)	7	9	8	11	11
Brussel Sprouts)	22*	2	4	4	4
Cabbage & Savoys)		18	9	10	11
Tomatoes	30	37	36	31	32
Other	27	25	30	35	28
Total Value	100	100	100	100	100

* Including Cauliflower

Source: Scottish Agricultural Economics.

Detailed statistics on the main crops are presented in Appendix IV. The main points arising from these statistics are as follows:-

Peas The acreage of peas has remained static at 4000-4500 acres except in 1971 when the acreage slumped to under 3000 acres. This followed the overproduction of frozen and canned peas in the previous year, coupled with a decline in consumption during the mild winter, when vegetables such as brussel sprouts and cabbage were freely available. Yields increased significantly during the 1960's although they tend to fluctuate from year to year depending on growing and harvesting conditions. This increase in yields led to an increase in output which in turn, despite a fall in price, led to an increase in the value of production in real terms of 25%. Overall consumption of peas fell slightly and by 1971 total consumption of peas in Scotland was just over 20,000 tons. Of this total, about a quarter was produced in Scotland, the remainder being imported.

The price paid by consumers for peas has fallen in real terms by 15% since 1963 and the producers receive only a small proportion of this retail price (less than $\frac{1}{3}$). This is due to the convenience and service elements added to the basic product by the processors and

distributors. The trend between 1963 and 1971 has been for an increase in the intermediaries share of the retail price. This is possibly due to consumers willingness to pay more for the greater convenience of frozen peas which appear to have been directly substituted for fresh peas, with the consumption of canned peas remaining relatively stable.

Brussel Sprouts Since 1965 the value of sprout production has almost trebled in real terms due to increases in acreage, yield and real prices. Consumption of fresh sprouts has risen, as has the consumption of frozen sprouts.

Cabbage and Savoys Increases in both yield and acreage have resulted in an overall increase in production of 20% since 1963. The value of output has fallen due to a fall in real price of almost 20%. Consumption has fallen by a little under 10% with the result that Scotland has become a net exporter of cabbage with production exceeding home consumption by about 4,000 tons per annum. Part of this surplus will be used in processing with the remainder being sent to markets in England. The price paid by consumers has also fallen in real terms but by proportionately less than the price paid to producers. Thus the producers' share of the retail price has fallen from 40% in 1965 to 24% in 1971.

Tomatoes A small increase in acreage and an increase in average yields by 43% has led to an increase in tomato production of one fifth since 1963. With real prices unchanged the real value of the output has also increased. Consumption in Scotland has fallen slightly so that the Scottish growers' share of the market has risen from 32% in 1963 to 35% in 1971. Consumer prices have increased in line with producer prices so that the grower received the same proportion of the final selling price in 1971 as in 1963 (approximately 68%).

Other Vegetable Crops There is a wide range of other vegetable crops grown commercially in Scotland, the most important of these being leeks and rhubarb.

ii) FRUIT CROPS

The output of fruit in Scotland has increased by almost one quarter since 1961, although it has fallen back recently from the peak reached in 1969-70. The increase in output has not kept pace with the increase in output from horticulture as a whole so that production is slightly less important now than it was in 1961 but it still represents almost 1/5th of total output.

TABLE 2.6

Output of Fruit Crops in Scotland

	Units	1961/62	1965/66	1969/70	1971/72	1972/73
Output						
Fruit Crops	£000s	1,351	1,906	3,091	2,563	2,715
All Horticulture	£000s	5,648	7,499	10,806	11,394	13,733
Importance of Fruit production	%	23.9	25.4	28.6	22.5	19.8
Value of output at 1962 prices	£000s	1,351	1,761	2,429	1,730	1,718

Source: Scottish Agricultural Economics

Raspberries remain the single most important crop whilst strawberries, after declining in importance towards the end of the 1960s, have increased rapidly since 1970.

TABLE 2.7

Product Structure of Fruit Production (by Value)

	1961/62	1965/66	1969/70	1971/72	1972/73
	%	%	%	%	%
Raspberries	64	62	76	63	68
Strawberries	19	15	15	26	22
Orchard Fruit	7	14	3	5	5
Other	10	9	6	6	5
	100	100	100	100	100

Source: Scottish Agricultural Economics

Detailed statistics on soft fruit production are presented in Appendix IV. The main points arising from these statistics are:-

Raspberries The acreage of raspberries has increased by almost ⅓ since 1963 and although yields increased rapidly in the late 1960's to reach a peak of over 2 tons per acre, they have fallen since 1970 to below the level in 1963. Prices and output have risen slightly in real terms.

Of the raspberries grown, almost 96% are sold for processing, the majority of these being used for the manufacture of jam. The tonnage used for processing reached a peak in 1969 but has declined as production declined in the early 1970's. The prices of raspberries for processing have remained static in real terms.

The remainder of the crop is sold fresh in Scotland although some are exported to other parts of the United Kingdom. The high cost of transport together with the perishable nature of the crop limits the number of markets to which raspberries can be sold. The price of raspberries sold fresh is considerably higher than those sold for processing, reflecting the higher costs of picking and packaging.

Strawberries The acreage of strawberries increased rapidly during the late 1960's and early 1970's despite falling real prices. The increase in acreage was also accompanied by an increase in yield resulting in production more than doubling between 1963 and 1972. The increase in yield also enabled growers to increase revenue per acre (in real terms) despite the fall in real price. This may go some way to explain the rising acreage.

The percentage of the crop sold fresh has fluctuated considerably from year to year but appears to be declining. The price on the fresh market is considerably higher than the processing price but to exploit this market entails greater costs in picking, packaging and transport. Also, the weather at time of harvest can greatly affect the yield and the length of the harvesting season, causing considerable fluctuations in the prices on the fresh market. As a result, the fresh market is less attractive, particularly to large growers, than the comparison of prices suggests.

The demand for raspberries and strawberries. Soft fruit is used as the raw material for a number of products such as jam, tinned and bottled fruit, yoghurt etc. It is therefore difficult to estimate the consumption of soft fruit in its various forms. Such information as is available is given in the Appendix. From this it can be seen that the jam consumption is falling by about 5% per annum, whilst consumption of canned and bottled fruit is rising. The consumption of fresh soft fruit is also declining.

iii) AMENITY CROPS

The value of non-food horticultural crops produced has risen rapidly during the 1960's and early 1970's and by 1972 the output was valued at almost £4 million compared to less than £1 million in 1961. The range of crops under this heading is very wide, ranging from flowers produced under glass to mature tree production for use in landscape work.

The rise in output has been the result of an expansion in nursery stock production following the increase in demand stimulated by changing methods of retailing.

TABLE 2.8

Output of Amenity Crops in Scotland

	Units	1961/62	1965/66	1969/70	1971/72	1972/73
Output						
Amenity Crops	£000s	1,661	2,117	2,571	3,554	3,984
All Horticulture	£000s	5,648	7,944	10,806	11,394	13,733
Importance of Amenity Crops	%	29.4	26.6	23.8	31.2	29.0
Value of output in real terms	£000s	1,661	1,956	2,020	2,399	2,520

SECTION 3 - THE MARKETING OF HORTICULTURAL CROPS

Edible horticultural crops

Edible horticultural crops are either sold in their natural state or are processed. The requirements of the fresh market and the processors are so distinct that two different methods of selling have developed. Produce is sold to processors normally by means of a contract, whilst fresh produce is normally sold through the wholesale market. Because of this distinction these two types of selling are dealt with separately.

i) THE PROCESSING INDUSTRY

The processing industry is based on two crops - raspberries and peas, although there has been some diversification into other crops in order to lengthen the season in which the factories are in operation. The processing of a crop either by canning or freezing reduces the perishability of the final product thereby increasing the time during which the crop is available for consumption. Processing can also increase the number of outlets through which the product can be sold, making selling on a self service basis possible by the elimination of waste. Both of the factors greatly increase the market potential for a crop. This is of great advantage to producers but against this must be weighed the fact that processing is a highly specialised operation carried out on a large scale by a small number of firms so that the producer of a crop for processing has only a small number of outlets through which he can sell. He becomes very dependent on the processor and the processor in turn becomes very dependent on him as a source of raw materials.

This interdependence has resulted in the crops normally being grown under contract. The producer sells the crop and the processor secures his supplies well in advance of harvesting by means of a contract. These contracts help to reduce the risks involved in this interdependence but even so both producers and processors remain vulnerable to any shift in the supply and demand situation for both the unprocessed and for the finished product. For example, in 1971 the area of peas in Scotland fell by one third and the price by a fifth due to processors cutting back on the contracted acreages as a result of overproduction of tinned and frozen peas during 1970. Problems may arise in the future if pea growing becomes less attractive financially to the producer compared to other crops such as cereals. In this case, the processors may have to offer higher contract prices to secure sufficient raw materials (It is interesting to note that the price received by producers for peas fell in real term between 1963 and 1972).

Raspberries Because of climatic suitability, raspberry production developed in the East of Scotland particularly in the counties of Perth and Angus. Along with this production, processing industries developed to utilise the fruit. In 1970, out of a total production of 16,000 tons of raspberries, between 500 and 750 tons were sold fresh whilst the remainder was disposed of as follows:

TABLE 3.1

Disposal of the Raspberry Crop in 1970 (estimates only)

	Tons	%
Fresh	500 - 750	4
Canning	2,500 - 3,500	22
Quick Freezing	500 - 750	4
Jam Manufacture	4,500 - 6,000	38
Juices	1,500 - 2,000	13
Other	3,000	19
Total	16,000	100

Source: Food Processing Opportunities in Scotland - Scottish Council.

Other Crops Almost all of the peas grown in Scotland are processed either by canning or freezing. Developments are also taking place in the processing of other vegetable crops, particularly brussel sprouts, with the setting up of a co-operatively owned processing plant in the East of Scotland.

ii) FRESH MARKET

The selling of fresh horticultural produce is based on the wholesale market. This method of selling has developed over a long period during which the bulk of fresh fruit and vegetables were sold to the consumer through a large number of small retailers. These retailers bought the majority of their produce requirements from wholesale markets, these markets being supplied with home grown produce by a large number of local growers, and with produce from abroad by importers. This resulted in a wide variety of produce being available in many different quality grades.

Within the market, the actual selling of produce is carried out by commission agents. These agents sell produce on behalf of growers at a fixed rate of commission.*

The price at which the produce is sold is fixed between the buyer and the commission agent on the basis of the supplies available within the market and the demand for produce from the buyers. In this way, supply and demand interacts and a price is fixed.

Until recently, the bulk of locally grown produce reached the consumer in this way, although direct selling by the grower to retailers or to the consumer did occur (see Fig. 3.1). However, even produce not passing through the market is subject to market influence, as the price in the wholesale market acts as a basis upon which the price between the grower and the retailer or the consumer is agreed.

The function of the wholesale market can be summarised as:-

a) Equating supply and demand by means of a variable price.

b) Supplying the small retailer with small quantities of a wide range of produce.

c) Providing an outlet for producers based on price competition

The survival of any marketing system depends on how well it meets the requirements of the people who use the system. In terms of the wholesale market this means retailers and producers. There are signs that the traditional wholesale market is not now meeting the needs of an important sector of the retail trade and the market is being by-passed.

Before looking more closely at the changing role of the wholesale market, it is necessary to examine the structure of food retailing in Scotland.

Retail Structure

Apart from a small quantity of produce sold direct by producers to consumers, the majority of horticultural food crops are sold via retailers. The retailing industry is therefore an important link between the producer and consumer and the requirements of retailers will affect both the producer and the consumer.

* At present between 7½% and 10%

TABLE 3.2

Retail Structure in Scotland

	Scotland		Great Britain	
	% of Grocer* shops	% of Grocery turnover**	% of Grocer* shops	% of Grocery turnover**
Co-operatives	12	24	8	15
Multiples	11	33	10	43
Independents	77	43	82	42
	100	100	100	100

* 1969/70 ** 1971

'Multiples' - shops which are part of a chain with 10 or more branches other than co-operatives.

There are considerable differences between the structure of retailing in Scotland compared to the rest of Gt. Britain. Co-operatives are far more important having a 25% share of the grocery turnover in Scotland compared to only 15% in Gt. Britain as a whole. There is a smaller proportion of independent shops but approximately the same proportion of multiples as in Gt. Britain. However, these multiples tend to be small and have only a 33% share of the grocery turnover compared to 45% in Gt. Britain as a whole. Hence, multiples tend to be in a relatively weak position in Scotland but there are indications that they are becoming more important. In 1971, the number of new supermarkets opened in Scotland was double that in 1969 and 1970.

The future development of retailing in Scotland is likely to be similar to that in the remainder of the country. In a recent report on the future pattern of shopping,* the development of retailing within the United Kingdom was summarised as follows:-

1. The gradual replacement of old shops by new ones will lead to a closure of businesses unable to pay the higher rents involved.

2. The multiples and co-operative societies are rationalising their businesses by closing down smaller units and opening fewer larger ones.

3. Competition between multiples and independents is forcing many independent traders out of business.

These factors will lead to a fall in the total number of shops, resulting in a concentration of sales through a small number of large retail chains.

* The Future Pattern of Shopping - Distributive Trade E.D.C.

TABLE 3.3

The percentage of households using different types of shops for their food purchases - 1969

	Fresh Fruit		Vegetables	
	Scotland	U.K.	Scotland	U.K.
Co-operatives	11	5	13	6
Multiples	31	20	29	17
Independents	54	68	53	71
Unspecified	4	7	5	6
TOTAL	100	100	100	100
Self Service	30	19	30	16
Counter Service	70	81	70	84
TOTAL	100	100	100	100

Source: National Food Survey 1969.

As might be expected, the type of shop used by households in Scotland shows a similar distribution to the numbers of shops. The main difference between Scotland and the United Kingdom as a whole is in the importance of self service shops, particularly multiples (including supermarkets) as a source of fruit and vegetables. Almost $\frac{1}{3}$ of households use this type of shop in Scotland compared with only 1/5 in the UK as a whole. The position of independents is far weaker in Scotland with almost 70% of households using this type of shop for fruit and vegetables in the United Kingdom compared to only 50% in Scotland.

This difference in retail structure in Scotland may be connected to the low consumption of fresh fruit and vegetables. The low consumption has led to a poor retail structure in terms of independent greengrocers, which in turn limits the range and quality of fruit and vegetables on display, leading in turn to low consumption.

The effect of the changing retail structure on the marketing of edible horticultural crops

The concentration of selling through a small number of large retail organisations has resulted in a change in the type of product required at the wholesale level. Instead of small quantities of a wide range of produce in different quality grades these shops now require large quantities of a standard quality product, continuously available throughout the season. This type of product has not been available on the wholesale market and therefore these shops have tended to look elsewhere - either to importers or to "unified supply organisations".

These "unified supply organisations" of which there are about 12 throughout the country gather produce from various sources (imports, direct from producers and from the wholesale markets) and re-process it to meet the supermarkets' requirements (possibly by re-grading, prepacking or transporting the produce to the supermarkets' stores). (see Fig. 3.1b).

This changing pattern in the marketing and the distribution of horticultural crops is likely to have a number of repercussions for producers. In particular, with the continued expansion of trade through multiples the Scottish producer must be in a position to supply produce to these outlets. Failure will result in a gradual decline in production as the number of alternative outlets decline.

Because of the very close relationship that exists between multiples and the unified supply organisations, selling to supermarkets means dealing with these organisations. In such a situation, the unified supply organisation is in a very strong position. It is able to bring supplies from many different countries obtaining the best price/quality mix, for the quantity required. Local producers are just one of a number of possible sources. To compete in this situation, the local producer must be able to match the marketing services (such as quality guarantees, bulk purchasing facilities, forward buying, firm price contracts, etc.) offered by other producers.

This level of sophistication in the marketing operation has been absent amongst local producers who have relied on the wholesale market to act as a clearing house for the produce. However, exporting countries have found it necessary to develop their marketing arrangements by the formation of marketing boards, etc. in order to capitalise on export opportunities. This has resulted in exporting countries being able to take advantage of the opportunities presented by the changing pattern of horticultural marketing, leaving the local producers with a decreasing share of the trade.

The problem facing Scottish growers is how to match the services offered by exporting countries.

ii) NON EDIBLE HORTICULTURAL CROPS

Non edible horticultural crops range from cut flowers to shrubs and ornamental trees. Production has increased rapidly in the last ten years and with the increase, new methods of selling have been developed. This increase in production has been in response to an increase in demand caused by a number of factors, including higher disposable incomes, more leisure time, a move from public to private housing in Scotland and also a greater public awareness of the importance of the environment. The methods of selling are through the wholesale market and by mail order, although, increasingly, produce is being sold through garden centres. (see Fig. 3.2a and b).

Wholesale market A high proportion of cut flowers and pot plants are sold through the wholesale market in exactly the same way as edible crops. In this case, however, the demand comes from mainly specialist florists and greengrocers.

Mail order The traditional method of selling ornamental trees and shrubs has been through specialist nurseries issuing catalogues and order forms through the post and customers ordering directly from the nursery. The orders are then despatched by post. However, this type of selling has declined as postal rates have increased and as containerisation of trees and shrubs has been developed.

Containerisation and container growing of trees and shrubs has made it possible to sell plants all the year round, whereas formerly the selling period was restricted to the winter when the plant was dormant. This change has led to a revolution in the selling of trees and shrubs - as revolutionary as the change-over from counter to self service in the sale of food.

Garden centres The result of this revolution has been the development of garden centres where the public buys trees and shrubs (plus other garden requisites) on a self service basis. These trees and shrubs are sold in containers and are available at any time during the year. There are at present 34 garden centres in the West College province and possibly 80 in Scotland altogether and all the indications are that the sales through garden centres will increase during the next few years.

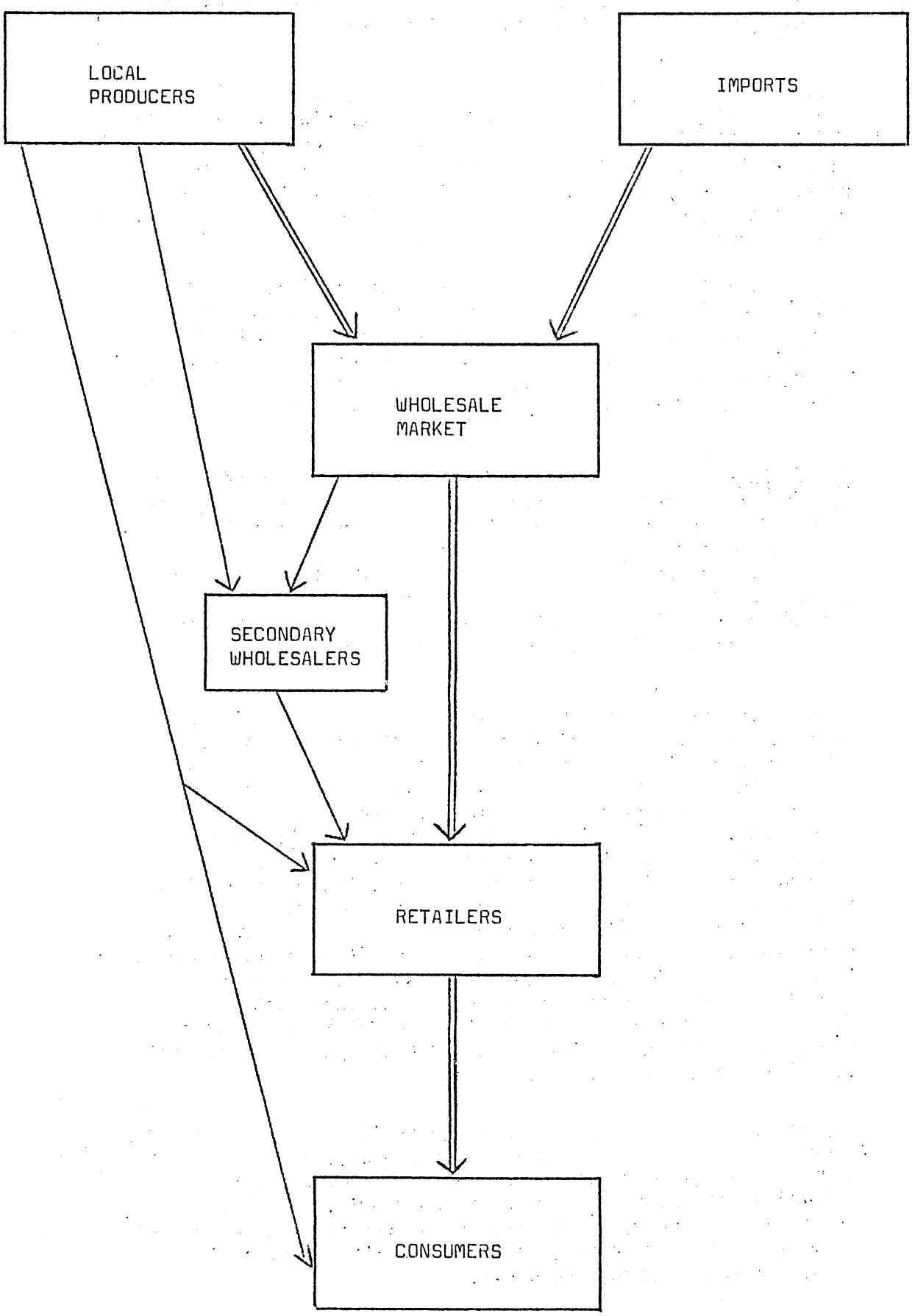
These developments have taken place at the expense of sales through the mail order catalogue and this has resulted in a shift in the point of sale from the producer (situated where production conditions are most suitable) nearer to the consumer with garden centres being situated near towns and on main roads. The development of the garden centres has often taken place on existing nurseries with the grower producing some of the plant material himself and buying the remainder from other producers both in Scotland and abroad. At the present time, the relationship between the garden centres and producers is in a state of flux. It remains to be seen whether there is a move towards greater specialisation into purely retailing units situated in or near population centres with production units being situated where conditions are most suitable, or whether development continues along the present lines of producer/retailers.

A further market for trees and shrubs is local authorities for landscape work on housing estates, new roads, etc. Although a certain amount of their requirements are grown by the authorities themselves, opportunities do exist for sales by specialist producers. For large contracts such as landscaping a new road, the producer will have to submit a tender in competition with other producers.

Fig. 3.1

The changing marketing channels of edible horticultural produce.

a) Pre 1960's



b) Post 1960's

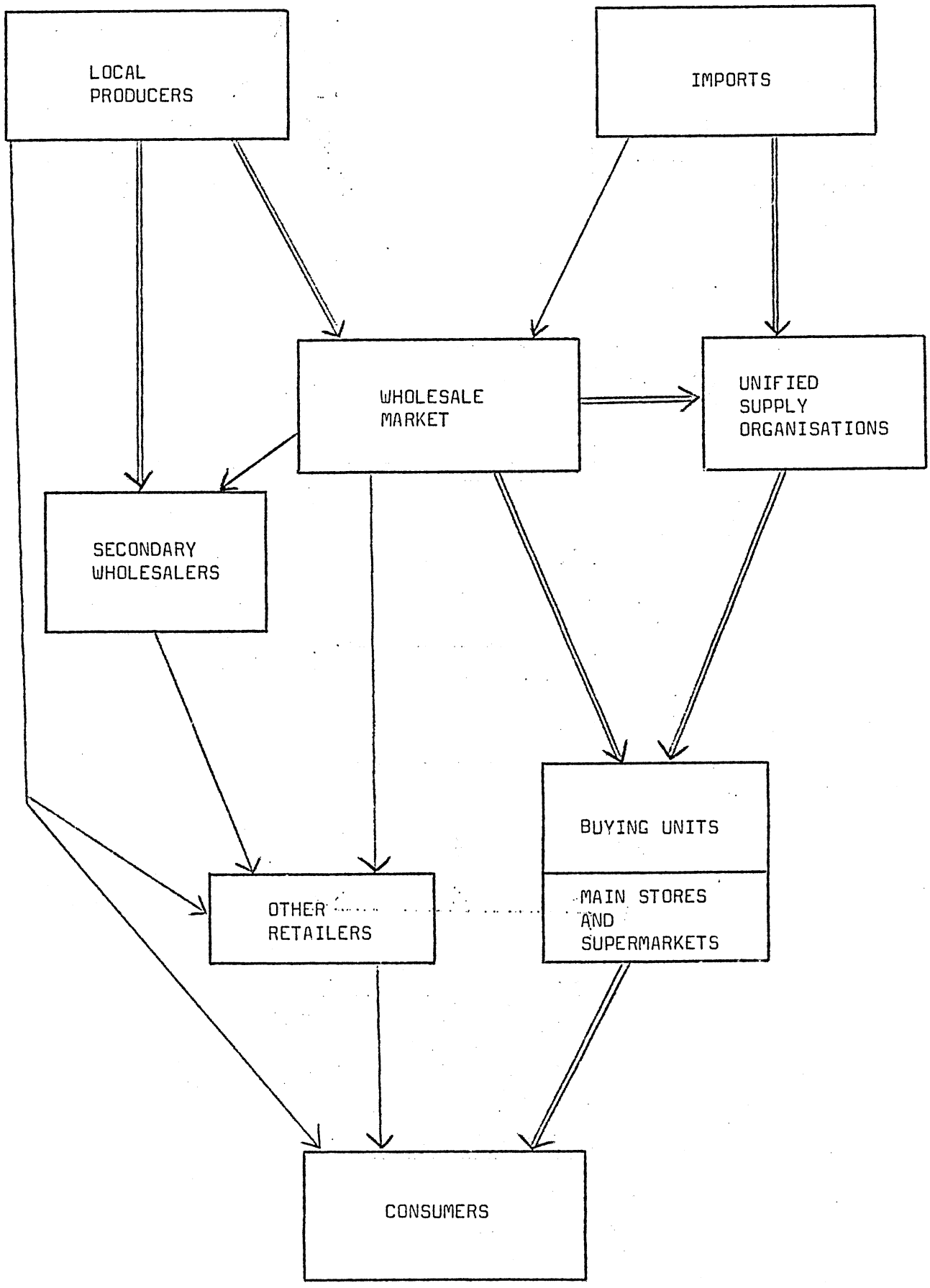
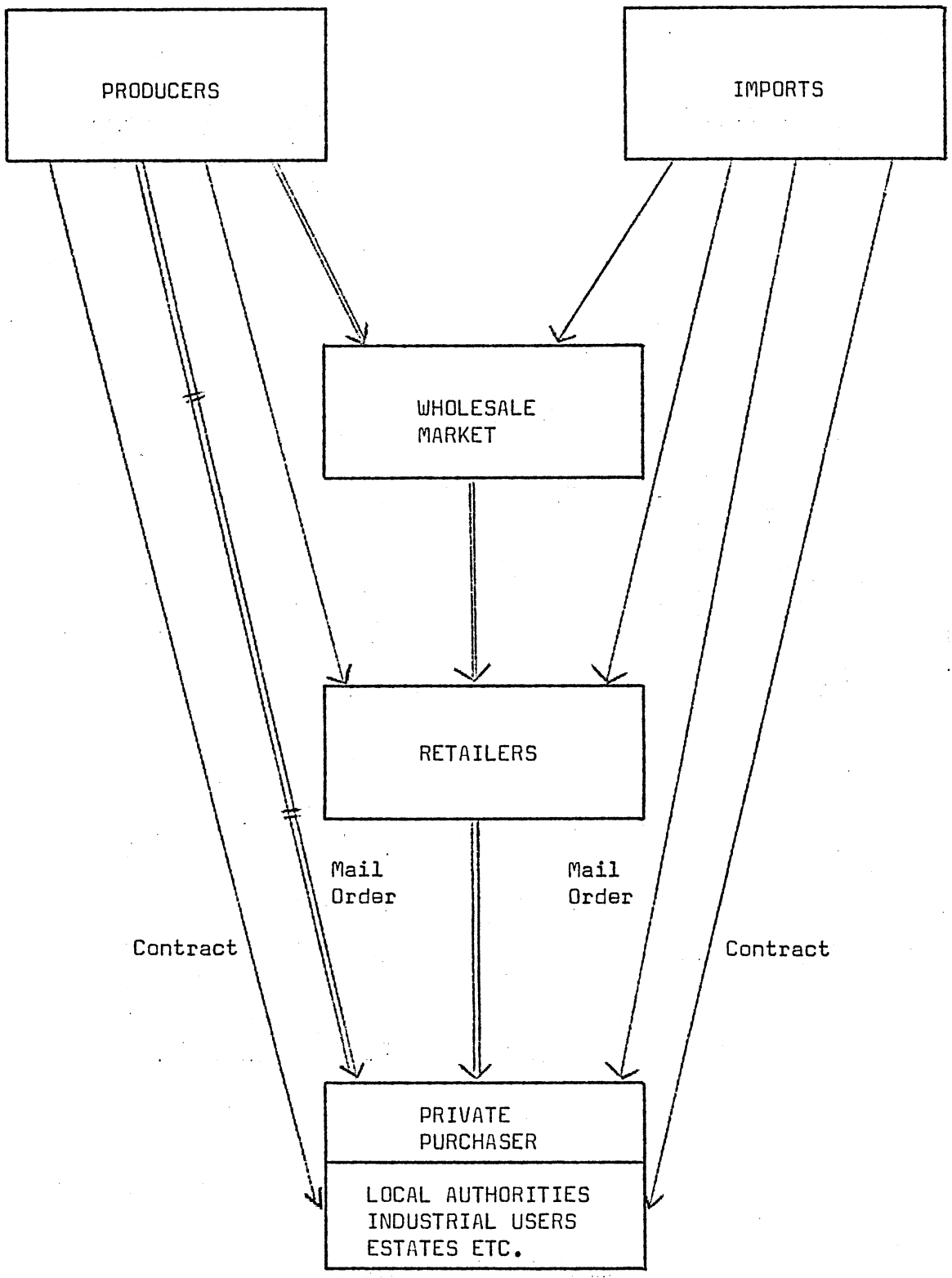

LOCAL PRODUCERS
IMPORTS
WHOLESALE MARKET
UNIFIED SUPPLY ORGANISATIONS
SECONDARY WHOLESALERS
BUYING UNITS
MAIN STORES AND SUPERMARKETS
OTHER RETAILERS
CONSUMERS

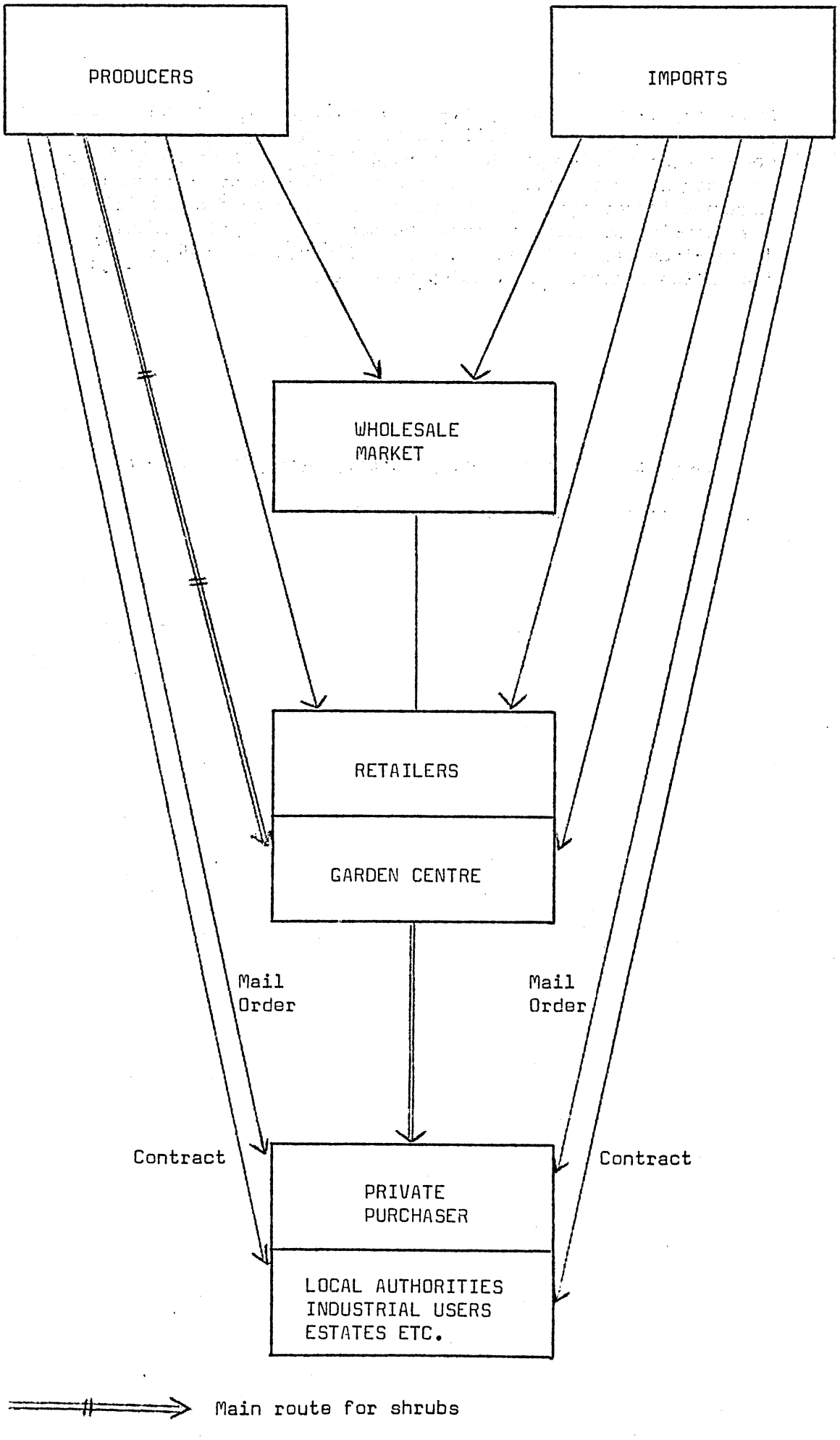
Fig. 3.2

The changing marketing channels of non-edible horticultural produce.

a) Pre 1960's



b) Post 1960's


PRODUCERS
IMPORTS
WHOLESALE MARKET
RETAILERS
GARDEN CENTRE
Mail Order
Mail Order
Contract
Contract
PRIVATE PURCHASER
LOCAL AUTHORITIES
INDUSTRIAL USERS
ESTATES ETC.
Main route for shrubs

According to a report* by the ESCA, this market has an annual requirement of some 1 million units of nursery stock worth possibly £½ million of which a relatively small proportion are produced in Scotland. The failure of the Scottish producer to obtain a larger share of the market was due to the inability of the Scottish producer to meet the quality and price requirements of the local authorities and also failure to provide large quantities of uniform planting material.

* A survey of demand for hardy nursery stock in Scotland.

B. T Barret, E.S.C.A. (1973)

SECTION 4 - CONSUMPTION

After passing through the retailers hands, produce eventually reaches the consumer. By feedback through the marketing system, the grower is made aware of the consumers' demands, although this demand may be considerably modified by the retailers' requirements. Changes in this demand will ultimately affect the price returned to the producer and therefore the producer must be aware of any changes in demand patterns so that he can adapt and modify his production and marketing systems to exploit these changes.

i) POPULATION

The total demand for a product will depend on the demand per head and the total population (changes in either will affect total demand). The population of Scotland is relatively stable at approximately 5.2 million and is unlikely to rise significantly during the next ten years.

The distribution of this population throughout Scotland is very uneven with 68% of the total being concentrated in the central Glasgow-Edinburgh area.

TABLE 4.1

Regional Pattern of Geographical Distribution of Population 1970 (based on planning regions)

Region	Population in 000's	per cent
Glasgow	2495.8	48
Edinburgh	1037.5	20
North East	447.6	9
Tayside	445.1	9
Highlands	275.8	5
Falkirk/Stirling	247.1	4
South West	148.9	3
Borders	101.2	2
Scotland	5199.0	100

Source: Annual Digest of Statistics H.M.S.O.

ii) THE SIZE OF THE SCOTTISH MARKET

From the data on consumption per head published in the National Food Survey, it is possible to estimate the size of the Scottish market. This estimate should be treated with some caution as small inaccuracies in the consumption figures could give rise to significant over or under estimates of the market. By comparing these consumption figures with estimates of production for the same period it is possible to obtain an indication of the Scottish producers share of his own market (see Table 4.2). This shows clearly that apart from cabbage and carrots, the production of crops is well below the requirements of the Scottish market.

TABLE 4.2

The consumption and production of horticultural crops in Scotland

	Consumption 3 yr. av. 1969-1971 oz/person/week	Total annual Consumption 000 tons (C)		Production 3 yr. av. 1969-1971 000 tons (P)	P as % of C
Cabbage	2.59	19.5		25.2	130
Brussel sprouts	0.90	6.8		3.9	57
Cauliflower	1.11	8.4		3.3	39
Leafy salads	0.68	5.1		4.8*	94
Carrots	3.02	22.8		23.5	103
Onions, shallots, leeks	3.11	23.5		3.6	15
Cucumber	0.19	1.4		0.5**	36
Mushrooms	0.14	1.1		0.2	18
Peas - Fresh	0.90	0.7			
Frozen	0.19	1.4	21.5	7.3	34
Canned	2.57	19.4			
Beans - Fresh	0.11	0.8			
Frozen	0.08	0.6	1.4	n.a.	-
Soft fruit	0.32	2.4		n.a.	-
Rhubarb	0.67	5.1		n.a.	-
Tomatoes	2.89	21.8		7.2	33

* Lettuce only

** 1970/1971 estimated

Source: National Food Survey and Scottish Agricultural Economics.

iii) COMPARISON BETWEEN CONSUMPTION IN SCOTLAND AND THE REMAINDER OF THE UNITED KINGDOM.

In comparing the consumption of horticultural crops in Scotland with that in the remainder of the UK a number of striking differences emerge (see Table 4.3)

TABLE 4.3

Consumption in Scotland compared to the United Kingdom (1971)

	U.K. national av. ozs/person/week	Scotland ozs/person/week	Scotland as a % of UK
Fresh green vegetables			
Cabbage	4.68	2.68	57
Brussel sprouts fresh	2.63	1.03	39
Cauliflower	2.71	0.99	36
Leafy salads	1.30	0.60	46
Peas fresh	0.53	0.08	15
Peas quick frozen	1.12	0.15	13
Beans fresh	1.35	0.08	6
Beans quick frozen	0.31	0.05	16
Other	0.19	0.06	31
Total	14.82	5.77	38
Other vegetables and veg. products			
Carrots fresh	3.07	2.85	93
Onions, shallots, leeks	3.04	2.94	97
Cucumber	0.75	0.21	28
Mushrooms	0.44	0.13	29
Canned peas	2.84	2.48	87
Other	10.82	10.76	99
Total	20.96	19.37	92
Fresh fruit			
Soft fruit	0.60	0.25	42
Rhubarb	0.54	0.67	124
Tomatoes	3.99	2.59	64
Other	18.93	14.21	75
Total	24.06	17.72	74

Source: National Food Survey.

Over the whole range of horticultural crops with the exception of rhubarb, consumption in Scotland is less than the national average and in the case of fresh green vegetables less than half the national average.

It is difficult to attribute these differences to factors other than tradition although in certain cases non-availability of some horticultural crops may be a contributory factor. Certainly, with such poor consumption in the home market the local grower faces tremendous problems of selling the crops he produces to a consumer who appears, superficially at least, not to be interested in horticultural food crops. (Conversely, producers could regard this low consumption as a tremendous opportunity to exploit a hitherto underdeveloped market).

The consumption of flowers in the United Kingdom is thought to be well below other European countries. Although separate figures are not available for Scotland it seems likely that consumption is also low.

iv) CHANGES IN CONSUMPTION OF HORTICULTURAL CROPS

Changes in consumption can be brought about in a number of ways. In particular improving standards of living, changes in methods of retailing and changes in technology can all affect consumption patterns.

The effect of improving standards of living

The effect of increasing affluence on sales can be measured from estimates of income elasticity of demand. These measure the effect of increasing income on the demand for certain products. For the main horticultural products, a forecast of consumption using estimates of elasticity of demand is made in Table 4.4. This assumes a rate of growth of 3% in National Income per annum.

TABLE 4.4

Effect of increasing incomes on demand

	Income elasticity of demand 1971	Consumption 1971 (000 tons)	Consumption* 1981 (000 tons)
Declining Products			
Jams, jellies and fruit curds	- 0.12	12.5	12.0
Peas (fresh)	- 0.23	0.6	0.6
Turnips and swedes (fresh)	- 0.33	20.6	18.6
Canned peas	- 0.46	18.8	16.2
Stable			
Cabbages	0.17	20.3	21.3
Brussel sprouts (fresh)	0.31	8.2	9.0
Cauliflower (fresh)	0.23	7.5	8.0
Leafy salads	0.53	4.5	5.2
Other fresh green veg.	0.68	0.5	0.6
Carrots (fresh)	0.16	21.6	22.6
Other root vegetables	0.42	1.7	1.9
Onions, shallots and leeks	0.03	22.1	22.3
Cucumber	0.70	1.6	1.9
Mushrooms	0.93	1.0	1.3
Misc. vegetables	0.95	1.4	1.8
Tomatoes	0.27	19.5	21.1
Growth Products			
Peas quick frozen	1.06	1.1	1.5
Beans quick frozen	1.12	0.4	0.5
Soft fruit other than grapes	1.15	1.9	2.6

* Assuming no change in relative prices.

Source: National Food Survey.

From this table it can be seen that there is likely to be a move towards convenience foods, particularly frozen vegetables and towards some of the more "exotic" vegetables such as cucumber, mushrooms etc. This will be accompanied by a decline in consumption of "basic" foodstuffs such as potatoes, turnips and swedes. For the Scottish industry, the most important trend is the decline in the consumption of jam, as raspberries and strawberries produced in the East of Scotland, are the most important ingredient.

A second important effect of increasing incomes is that consumers are prepared to pay extra for quality. This may give the Scottish producer a real long term advantage over his competitors because one of the quality characteristics associated with edible and certain non-edible crops is freshness. Local producers will be able to claim that their produce reaches the consumer more quickly than imported produce and is therefore fresher. The advantage may be translated into the type of price premium associated with Scottish tomatoes.

Methods of retailing

The importance of multiples as a source of fruit and vegetables has already been described. As competition increases between these multiples for the grocery trade, the range and quality of horticultural crops available for sale may improve and this in turn could stimulate demand. This is because one of the important ways in which multiples can obtain a long term advantage over their competitors is through an improvement in the presentation of fresh foods (meat, fruit and vegetables) on sale in the store. With branded grocery products price competition is an important means of obtaining an advantage and this tends to be short lived as the competitors adjust their prices. However, with meat, fruit and vegetables, the presentation of the products can be improved to give the shop an advantage that is not related to price. This type of advantage is more difficult to imitate and therefore tends to operate for a longer time. As a result of this type of competition the quality of fruit and vegetables presented to the consumer is likely to improve and consumer demand may be stimulated.

As far as the sale of non-edible horticultural products is concerned, the effect of garden centres, plus the development of container growing techniques on sales, have already been described. With increasing developments in this area, a continued expansion of trade can be expected.

The effect of changes in technology

The effect of developments in the food processing industry on the consumption of food products has been spectacular, and there is no reason to doubt that future developments could also result in radical changes in consumption. At present, the range of fruit and vegetable crops being processed (particularly frozen) is being continually increased. This results in the crop being available for consumption on an "all the year round" basis. One of the main products in which development is taking place at the present time is the freezing of raspberries by new methods that retain the raspberries' fresh flavour. The successful development and commercial use of these techniques could more than offset the declining consumption of raspberries in the form of jam.

Consumer knowledge

Scotland is a country of low fruit and vegetable consumption and a number of reasons for this have been suggested such as poor retail structure. Even with improvements in the structure plus improvements in processing techniques, there will exist a large proportion of the population for whom the eating of horticultural crops remains a novelty. One of the reasons for this is a lack of knowledge on the part of housewives on how to prepare and serve fruit and vegetables. A similar lack of knowledge can be identified in the buying of trees and shrubs for the garden and where understanding of how to grow plants may be necessary before consumers can be persuaded to buy garden products. Some progress in consumer education has been made by garden centre operators, where improved labelling, the use of simple names and the availability of shrubs on an all year round basis have stimulated trade. With edible crops, little has been done to promote the sale of fresh vegetables, although of course processors are continually trying to increase the sale of processed vegetables.

SECTION 5 - DISCUSSION AND CONCLUSION

This report has described the present state of Scottish Horticulture and a number of problem areas have been identified. The task now is to look towards the future and to identify the opportunities and the difficulties facing the industry so that those within the industry can plan its future development successfully. Predicting the future is obviously difficult, particularly in view of the changing environment within which any industry must operate. However, certain patterns and trends can be identified, certain problem areas are already in evidence and from these it is possible to build up a picture of the future.

This examination of the future is divided into three main parts. The starting point is a summary of the opportunities presented by the changes taking place in the consumption and the marketing of horticultural crops. The second part deals with the ways in which the industry could exploit these opportunities and finally this exploitation will require resources in terms of land, labour and capital plus new skills and technology. The provision of these resources is discussed in the third section.

i) THE OPPORTUNITIES

Opportunities for the horticultural industry are likely to arise from the following developments:-

a) The increasing consumption of convenience foods.

b) Improvements in the methods of processing.

c) An increasing willingness by consumers to pay a premium for quality and freshness.

d) A stimulation of the demand for edible horticultural produce as a result of increased competition between multiples.

e) A continuing increase in the demand for non-edible crops sold through garden centres.

ii) EXPLOITING OPPORTUNITIES

These opportunities will not be of benefit to the industry unless the industry is in a position to take advantage of them. In fact there is a history of missed opportunities in the industry as a study of the Scottish producer's share of his own market indicates.

This failure of the industry in the past has probably been due to the small size of production units and the unwillingness of producers to work together. Only in raspberry production and in contract vegetable growing is there any "large scale production". In these two areas; the concentration of the number of possible outlets for the crop in the hands of a small number of processors, their requirements in terms of large quantities of the product, plus the need to use the capital invested in machinery (such as mobile pea viners) as efficiently as possible, has resulted in an increase in the size of the production unit. No such pressures have been exerted on the producers of crops for the fresh market and consequently production units have remained small.

Until recently the small size of the production units has not been too great a disadvantage because of the existence of the wholesale market which acted as a clearing house for local produce. However, as the needs of retailers and particularly multiples have changed, so the requirements of the wholesale market have changed. There is an increasing demand for large quantities of evenly graded produce. The small unit is unable to provide this type of product or provide the marketing services in terms of quality grading, bulk purchasing facilities, forward buying, firm price contracts etc. demanded by the buyers who operate on behalf of the multiples. These services can only be provided economically by organisations controlling the marketing of large quantities of produce (e.g. Guernsey Tomato Marketing Board).

The situation is likely to become even more critical with the increasing concentration of buying power at the retail level. More produce is likely to by-pass the market and this will eventually interfere with the price fixing mechanism of the wholesale market. As smaller quantities pass through the market it will become increasingly liable to shortages and gluts and the price fixed will show an increasing tendency to fluctuate. At present, the wholesale market fixes the price not only for the produce passing through the market but often for produce by-passing it. Obviously some other method of price fixing will have to be developed between producers and buyers in this situation. Only by working together can producers hope to negotiate satisfactory prices with the large buyers.

Looking at the three main sectors of horticulture (crops for processing, non-edible crops and edible crops for the fresh market) the present problems in exploiting the opportunities are as follows:-

Processing industries

With the crops used by the processing industries, the marketing is taken out of the producer's hands leaving him to concentrate on production problems but in doing so he accepts only a small share of the final price paid by the consumer. The production of the crop is limited not by the producer (who may be keen to increase production) but by the processor. This control over the production of the crop was evident in 1970 when, because of over production in the previous year, pea processors cut back on the contracted acreage by $\frac{1}{3}$ resulting in many producers being unable to grow the crop.

In this situation, the producer is dependent on the decisions made by the processor. Consequently he is in a very weak position in trying to increase production. This is particularly unfortunate, as the consumption of both canned and frozen foods is likely to increase. In response to this increase in consumption, processors will expand their processing capacity and the demand for raw materials will increase. However, there is no guarantee that this increase will occur in Scotland. The siting of new processing factories and the expansion of old ones will occur in areas where the processor can obtain supplies of materials of the correct quality. The Scottish grower is only one of a number of possible sources.

One method of trying to exploit the market for convenience food is for producers themselves to become involved in processing. Some attempts have already been made by vegetable producers in the East of Scotland but it requires a large capital investment by producers, a willingness to co-operate and above all, the right kind of management expertise.

Non-edible horticultural crops

The production of non-edible horticultural crops has increased rapidly in the last few years, although within the grouping, some crops have increased more rapidly than others. In exploiting the opportunities in this sector of the horticultural industry, two broad sub-divisions can be made into:-

a) flowers and pot plants sold for interior house decoration

b) trees and shrubs sold for garden decoration.

Flowers and Pot Plants

At the present time, no clear cut opportunity for increasing sales of flowers and pot plants has been identified. The market seems to be limited by low consumption per head (estimated to be only $\frac{1}{4}$ of the consumption per head in Germany). Coupled with this problem of low consumption is the poor retail structure.

Traditionally, flowers and pot plants were sold through florists and greengrocers and with the decline in numbers of these shops, the number of outlets has declined. There are signs that supermarkets and department stores are interested in selling pot plants where these have a relatively long shelf life and require little attention in the shop. However, there has been little interest in the more sensitive plants and flowers which do not fit into the supermarkets method of trading (i.e. self service). The result has been an overall decline in the number of outlets through which the consumer can buy flowers.

Before attempting to increase demand, producers must try to increase the number of points of sale, possibly by tackling the technical problems of prepacking flowers (so that they can be sold by supermarkets) or developing their own retail outlets, as has been done in the South of England. This will require large scale production or co-operation between smaller producers in order to make these developments economically feasible.

Hardy Nursery Stock

The production of hardy nursery stock has been the growth point of the horticultural industry. This is the one area of horticultural production where producers have become "price-fixers" able to base selling prices on costs plus profit, rather than "price-takers" dependent on the supply and demand situation. The growth of the industry has basically been the result of the development of garden centres as a method of selling trees and shrubs, as well as other garden requisites. Further growth is likely to depend on how the system of selling develops.

In many cases garden centres have been developed on existing nurseries where the emphasis has been switched from production to retailing. Because of the different skills involved, this development out of production into retailing does not necessarily mean that the retailing operation is carried out with the same skill. In fact, the demand for trees and shrubs is such that a profitable venture could continue, even without 100% efficiency.

As competition increases between garden centres and as the expertise in selling through this type of outlet increases (possibly by the introduction of expertise from outside horticulture) the less efficient garden centre operator may find it increasingly difficult to compete.

Overall, it is possible that the trend will be away from producer/retailers towards specialised retailers with these retailers linked closely to specialised producers. This will present problems to the Scottish producer who will be only one of a number of possible suppliers to these retailers. Production is likely

to be concentrated in climatically suitable areas, provided that there is skilled labour available and taking into account transport costs. It is therefore important that Scottish producers are organised to supply the garden centres and are as efficient as the producers in other parts of Europe - otherwise they could find themselves with a decreasing share of the Scottish market.

Edible crops for the fresh market

Opportunities have been identified for increasing the production of certain crops and by better organisation, for increasing the Scottish producer's share of the home market. One possibility is to increase the size of the production units so that a single producer can provide the marketing services necessary to compete with imports from other countries. Alternatively, producers operating together could jointly provide these services.

The setting up of large scale production units does not seem feasible at the present time because of the capital involved and also it is doubtful if there is sufficient management expertise available within the industry to run these large units. A far more attractive solution is a linking together of small scale production units and the joint provision of the marketing services. It is pleasing to note that at the present time some progress in co-operative marketing is being made - such progress can only be welcomed and encouraged.

iii) RESOURCE AVAILABILITY

Having identified the opportunities for the Scottish grower and seen how these could be exploited, it is necessary to turn to the resources that will be required to produce the crops. The basic ingredients are land (and climate), labour and capital.

Land (and climate)

In its report on the food processing opportunities in Scotland, the Scottish Council (Development and Industry) concluded that there were substantial areas with soils and climate suitable for the production of outdoor fruit and vegetable crops including brussel sprouts, carrots, beetroot, vining peas, broad beans, rhubarb, raspberries, strawberries, gooseberries and black currants. In addition, there was a wide range of other crops that could be grown successfully.

The production of crops under glass is also unlikely ever to be restricted by a shortage of land on a national basis, although the concentration of the industry in the Clyde Valley has

resulted in a shortage of suitable land in that area. The further development of the industry in a more suitable area such as South Ayrshire would seem to be desirable in the long term to overcome this shortage of land. Land and climate are also unlikely to limit the production of amenity crops. The climate within the country varies considerably from the West to East coasts so that a range of climatic conditions can be provided for plants.

Labour

The number of people employed in agriculture and horticulture has declined over a number of years. Part of this decline is due to the higher wages offered in industry as compared to agriculture. In 1971 the average weekly earnings in manufacturing industries was £30.83 for a 44.7 hour week compared to £19.13 for a 44.1 hour week in agriculture (general workers). Also, it is suggested that horticulture is a relatively unattractive job because of the type of work done. Despite this, it is difficult to state categorically that horticultural production is being restricted by a shortage of labour. The size of the gap between wages paid in agriculture or horticulture and those paid in other industries has remained unchanged. If production was being limited by a shortage of labour then one might have expected wage rates in agriculture and horticulture to have been bid up more rapidly than those in other industries.

Progress in the industry will depend to a great extent on improvements in marketing and the operation of large units for processing and selling. This will require the introduction of managerial and marketing skills at a level not previously found in the industry. Therefore, whilst labour for production may not become a limiting factor, a shortage of labour with sufficient managerial and marketing skills may become critical.

The one area in which skilled labour for production may limit expansion is in nursery stock production. Many of the techniques used in the production of trees and shrubs require a high degree of skill and this skill is likely to be at a premium during a period of expansion.

Capital

The capital requirements of the various sectors of horticulture vary considerably. In glasshouse production capital is likely to remain the most important factor limiting production, whereas in the production of outdoor vegetables, the amount of capital required is fairly low and is unlikely to be a major constraint on production.

Over the industry as a whole, however, the provision of capital for processing plants, central packing stations, prepacking units etc. is likely to place a considerable burden on the industry, if advantage is to be taken of the present market opportunities.

iv) CONCLUSIONS

Opportunities for Scottish horticulture are likely to be created by the increasing consumption of convenience foods, by the increasing sales of non-edible horticultural crops through garden centres and by the increasing range of fruit and vegetable crops consumed. Improving standards of living may also make it possible to sell Scottish produce at a premium on the grounds of quality and freshness.

To take advantage of these opportunities and to improve the present level of competitiveness within the industry, recommendations are suggested as follows:-

1. To improve the marketing and distribution of horticultural produce, opportunities for training at graduate and post graduate levels should be made available. Training facilities should also be provided for those within the industry to give them a better understanding of the benefits of improvements in management and marketing.

2. Until a pool of expertise becomes available from within the industry, the industry must be prepared to buy appropriate expertise from outside horticulture.

3. To provide those within the industry with information on retailer and consumer needs, a co-ordinated research programme should be undertaken into the retailing and consumption of horticultural products. In particular, this should be aimed at determining firstly the reasons for the low consumption of horticultural food products and secondly, the possible ways of obtaining a premium price of Scottish grown produce over imported produce.

4. Edible crops - processing

   a) Continued research into new methods of freezing soft fruit is needed so that new products can be introduced to replace the decline in the use of soft fruit for jam manufacture.

b) To take advantage of the increasing consumption of convenience foods, attempts should be made to increase the range of crops that can be sold ready to use, either quick frozen or "boil in the bag".

c) Action should be taken by producers to ensure that expansion of processing capacity occurs in Scotland by encouraging existing manufacturers to expand and/or by the provision of processing and marketing facilities on a co-operative basis.

5. Edible crops - fresh

Continued encouragement should be given to the setting up of co-operative marketing schemes to ensure that local producers can compete with imports from other countries.

6. Flowers and pot plants

It is possible that increased sales could be achieved by increasing the number of outlets from which flowers and pot plants can be sold. Therefore, an investigation into the prepacking of flowers and into the feasability of producers setting up their own retail outlets should be undertaken.

7. Shrubs

There appears to be no restriction on the market for trees and shrubs at the present time and the greatest problem appears to be the relationship between suppliers and retail outlets. Producers must ensure that the produce sold through garden centres is produced in Scotland. An investigation of possible methods of improving the links between producers and retailers should be undertaken.

8. Research directory

Finally, even with the suggested improvements in marketing, the Scottish producer must remain competitive in terms of production costs with producers in other countries. This can only be achieved by the swift application of new cultural techniques. To this end, the dissemination of research and development findings by the various institutions involved in horticulture research should be as speedy as possible. One method of helping to achieve this would be the publication of a research directory summarising the work at present being done, by various institutions, involving horticultural crops in Scotland, and, where relevant, work being carried out in other countries.

APPENDIX

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i) SIZE STRUCTURE OF THE HORTICULTURAL INDUSTRY

TABLE A.1

Classification of glasshouse units and acreage by size groups (1969)

Size Group (Sq. ft.)	Units		Acreage	
	Number	%	Area	%
1 - 9,999	672	69.3	56.4	21.3
10,000 - 49,999	264	27.2	134.9	50.9
50,000 - 99,999	24	2.5	35.8	13.5
100,000 +	10	1.0	37.9	14.3
TOTAL	970	100.0	265.0	100.0

TABLE A.2

Classification of raspberry units and acreage by size groups (1969)

Size Group (Acres)	Units		Acreage	
	Number	%	Area	%
$\frac{1}{4}$ - $\frac{3}{4}$	226	27	77	1
1 - $2\frac{3}{4}$	189	23	307	4
3 - $9\frac{3}{4}$	220	27	1,152	15
10 - $29\frac{3}{4}$	118	14	1,996	26
30 acres +	76	9	4,146	54
TOTAL	829	100	7,678	100

TABLE A.3

Classification of strawberry units and acreage by size groups (1969)

Size Group (Acres)	Units		Acreage	
	Number	%	Area	%
¼ - ¾	293	40	121	6
1 - 2¾	263	36	405	20
3 - 9¾	123	17	627	31
10 - 29¾	44	6	648	32
30 acres +	5	1	223	11
TOTAL	728	100	2,024	100

TABLE A.4

Classification of pea production units and acreage by size groups (1969)

Size Group (acres)	Units		Acreage	
	Number	%	Area	%
¼ - 29¾	31	31	462	11
30 - 50¾	25	25	967	23
50 - 69¾	33	34	1,850	44
70 plus	10	10	927	22
TOTAL	99	100	4,206	100

Source: Scottish Agricultural Economics Vol. XXI

ii) HORTICULTURE IMPROVEMENT SCHEME

The Scheme, made under Part I of the Horticulture Act, 1960, provided for grants to horticultural producers, the owners of land occupied by horticultural businesses and horticultural producers co-operative marketing associations, towards the cost of providing or improving buildings and equipment for storage or preparation for market of horticultural produce. Grants were also available for improvements to heating systems and certain other long term improvements. (The level of grant aid was one third of the approved cost). Since its inception, the scheme has been modified and extended.

a) 1964

The list of items eligible for grant was extended to incorporate the replacement, reconstruction and improvement of glasshouses, the provision of irrigation, ventilation, harvesting and planting equipment.

b) 1966

For the first time the scheme was extended to include in the list of items eligible for grant, the erection as well as the replacement of glasshouses.

c) 1967

The rate of grant was increased to 38⅓%.

d) 1971

The rate of grant was reduced to 35%, and the range of items eligible for grant was again extended.

e) 1972

The rate of grant was increased to 40%.

Owing to the rapid uptake of grants during 1972 and 1973, the scheme was prematurely ended in July 1973. New schemes are to be introduced in the near future.

iii) Calculation of labour productivity

a) TABLE A.5

Output of horticultural crops

	Output £m.	Retail Price Index	Output at 1962 Prices £m.
1962/1963	6.19	101.6	6.19
1969/1970	10.8	132.3	8.29 at 1970/71 prices
1970/1971	12.2	138.3	12.2
1972/1973	13.7	162.0	11.7

b) Cost of labour

TABLE A.6

Trends in labour force, hours worked, average earnings and total cost 1962 - 1972

	Nos. employed	No. of man weeks	hrs. per week (2)	total No. hours	av. earnings per hr. (£)(3)	total cost £000s
1962 men	2,239	116,428	46.3	5,390,616	.2231	1,202.6
(1)women	707	36,764	46.7	1,716,879	.1672	287.1
(4)part-time	1,415	73,580	23.3	1,714,414	.1672	286.7
				8,821,909	.2013	1,776.4
1969 men	1,280	66,560	43.4	2,888,704	.3581	1,036.2
women	404	21,008	42.3	888,638	.2666	236.9
part-time	1,116	58,032	21.1	1,224,475	.2666	326.4
				5,001,817	.3197	1,599.5
1970 men	1,526	79,352	43.0	3,412,136	.3958	1,350.5
women	482	25,064	41.9	1,050,182	.3038	319.0
part-time	1,210	62,920	20.9	1,315,028	.3038	399.5
				5,777,346	.3581	2,069.0
1972 men	1,316	68,432	43.0*	2,942,576	.4697	1,382.1
women	416	21,632	41.0	886,912	.3414	302.8
part-time	1,165	60,580	20.5	1,241,890	.3414	424.0
				5,071,378	.4158	2,108.9

(1) Assuming same ratio of men to women throughout the decade.

(2) Scottish Agricultural Economics - average weekly hours for general workers. 1972 figures estimated.

(3) Scottish Agricultural Economics - average weekly earnings 1972 estimate on basis of new statutory wage rates.

(4) Part-time hours estimated at half the hours of a full-time employee. Wage rate taken as average female rate.

TABLE A.7

Lettuce production consumption and prices

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963-1972
PRODUCTION	Acreage	acres	398	521	537	540	633	591	483	+ 21.4
	Yield/ acre	tons	4.1	4.3	4.4	4.3	7.7	7.4	10.4	+153.7
	Output	000 tons	2.9	3.7	3.7	3.6	6.4	4.4	5.0	+ 72.4
	Price	£/ton	67.6	81.5	88.3	119.4	112.2	127.3	154.5	+128.6
	Real price	£/ton	67.6	75.3	76.6	93.8	82.9	85.9	97.8	+ 44.7
	Value	£000s	196	303	327	430	718	560	777	+296.4
	% Total hortic. output	%	2.8	4.0	3.9	4.0	5.9	4.9	5.7	-
CONSUMPTION	Per person	ozs./ week	0.58	0.55	0.67	0.76	0.67	0.60	-	+ 3.4
	Total for Scotland	000 tons/ annum	4.4	4.2	5.1	5.7	5.1	4.5	-	-
	Production as a % of consumption	%	65.9	88.1	72.5	63.2	126.3	80.0	-	-
PRICES	Price paid by consumers (A)	p/lb.	10.8	11.5	12.5	13.4	14.4	14.9	-	+ 37.4
	Price rcvd. by producers (B)	p/lb.	3.01	3.63	3.94	5.33	5.01	5.68	-	-
	B as a % of A	%	27.8	31.6	31.5	39.8	34.8	38.2	-	-

TABLE A.8

Pea production, consumption and prices

			UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963/72
PRODUCTION	Acreage		000s acres	4.0	4.1	4.2	4.2	4.4	2.9	4.5	+ 12.5
	Yield/acre		tons	1.1	1.1	2.1	1.6	2.0	2.0	1.6	+ 45.5
	Output		000 tons	4.5	4.6	8.8	7.1	9.1	5.8	7.4	+ 64.4
	Price		£/ton	37.6	40.9	40.0	43.4	50.3	39.3	45.6	+ 21.3
	Real price		£/ton	37.6	37.7	34.7	34.1	37.2	26.5	28.9	- 23.1
	Value		£000s	169	188	352	308	453	228	338	+100.0
	% Total hortic. output		%	2.4	2.5	4.2	2.9	3.7	2.0	2.5	-
CONSUMPTION	Fresh	PER PERSON	ozs per person per week	0.24	0.24	0.32	0.11	0.09	0.08	-	- 66.7
	Frozen			0.05	0.09	0.15	0.25	0.16	0.15	-	+200.0
	Canned			2.48	2.59	2.28	2.58	2.65	2.48	-	-
	Total			2.77	2.92	2.75	2.94	2.90	2.71	-	- 2.2
	Fresh	TOTAL	000 tons per annum	1.8	1.8	2.4	0.8	0.7	0.6	-	-
	Frozen			0.4	0.7	1.1	1.9	1.2	1.1	-	-
	Canned			18.7	19.5	17.2	19.4	20.0	18.8	-	-
	Total			20.8	22.0	20.7	22.2	21.9	20.5	-	-
	Production as a % of consumption		%	21.6	20.9	42.5	32.0	41.6	28.3		
PRICES	Fresh	PRICE PAID	p/lb.	3.46	4.58	4.12	4.60	5.82	5.00	-	+ 44.5
	Frozen		p/lb.	13.58	14.00	14.13	15.25	15.01	15.57	-	+ 14.7
	Canned		p/lb.	5.33	5.50	5.54	5.71	5.97	6.70	-	+ 25.7
	Wt. av. price (A)		p/lb.	5.31	5.51	5.84	6.46	6.22	7.14	-	+ 34.5
	Price rcvd. by producer (B)		p/lb.	1.67	1.82	1.78	1.93	2.24	1.74	-	-
	B as a % of A		%	31.5	33.0	30.5	29.9	36.0	24.4	-	-

TABLE A.9

Carrot production, consumption and prices

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963/72
PRODUCTION	Acreage	acres	1053	823	1113	1799	1877	1660	1948	+ 85.0
	Yield/acre	tons	8.2	9.1	13.6	12.7	11.9	13.1	14.5	+ 76.8
	Output	000 tons	11.2	9.7	18.9	26.4	25.0	19.1	28.2	+151.8
	Price	£/ton	10.2	13.3	12.5	14.1	17.9	13.7	21.7	+112.7
	Real price	£/ton	10.2	12.3	10.8	11.1	13.2	9.3	13.7	+ 34.3
	Value	£000s	114	135	236	371	409	261	612	+436.8
	% Total hortic. Output	%	1.6	1.8	2.8	3.4	3.4	2.3	4.5	-
CONSUMPTION	Per person (fresh)	ozs per person per week	3.33	3.36	2.97	3.27	2.94	2.84	-	+ 14.4
	Total for Scotland (fresh)	000 tons per annum	25.1	25.4	22.4	24.7	22.2	21.6	-	-
	Production as a % of consumption	%	44.6	38.2	84.4	106.9	112.6	88.4	-	-
PRICES	Price paid by consumer (fresh) (A)	p/lb.	3.79	3.00	3.00	3.63	3.43	3.90	-	+ 2.9
	Price rcvd. by producer (B)	p/lb.	0.45	0.59	0.55	0.62	0.78	0.61	-	-
	B as a % of A.	%	11.9	19.7	18.3	17.1	22.7	15.6	-	-

TABLE A.10

Brussel sprouts production, consumption and prices.

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1965/72
PRODUCTION	Acreage	acres	1055	911	927	1092	1296	1099	1324	+ 45.3
	Yield/acre	tons	1.7	1.6	2.6	2.2	4.2	3.5	3.0	+ 76.5
	Output	000 tons	1.8	1.4	2.5	2.5	5.4	3.8	4.0	+185.7
	Price	£/ton	-	51.1	59.1	74.4	50.5	52.0	80.0	+ 56.6
	Real price	£/ton	-	47.2	51.3	58.5	37.3	35.1	50.6	+ 5.9
	Value	£000s	-	72	148	181	273	198	320	+344.4
	% Total hortic. output	%	-	1.0	1.8	1.7	2.2	1.7	2.3	-
CONSUMPTION	Per person	ozs per week	0.69	0.76	0.88	0.74	0.88	1.08	-	+ 56.5
	Total for Scotland	000 tons per annum	5.2	5.7	6.6	5.6	6.7	8.2	-	-
	Production as a % of consumption	%	-	24.6	37.9	44.6	80.6	46.3	-	-
PRICES	Price paid by consumers (A)	p/lb.	4.0	3.8	4.4	5.1	5.0	4.7	-	+ 17.5
	Price rcvd. by producers (B)	p/lb.	-	2.3	2.6	3.3	2.4	2.3	-	-
	B as a % of A.	%	-	60.5	59.1	64.7	48.0	48.9	-	-

TABLE A.11

Tomato production, consumption and prices

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963/72
PRODUCTION	Acreage	acres	207	214	201	169	200	194	188	+ 9.2
	Yield/acre	tons	31.9	34.2	33.3	36.0	35.5	35.1	45.7	+ 43.3
	Output	000 tons	6.6	7.9	7.3	7.8	7.1	6.8	8.6	+ 30.3
	Price	£/ton	167	177	186	240	247	239	260	+ 55.7
	Real Price	£/ton	167	164	161	189	182	161	166	-
	Value	£000s	1101	1295	1247	1872	1757	1623	2238	+103.3
	% Total hortic. output	%	15.9	17.3	14.9	17.3	14.4	14.2	16.3	-
CONSUMPTION	Fresh	ozs per person per week	2.77	2.73	2.82	3.28	2.82	2.57	-	- 7.2
	Canned		0.05	0.10	0.08	0.10	0.12	0.10	-	+100.0
	Fresh	000 tons per annum	20.9	20.6	21.3	24.8	21.3	19.5	-	-
	Canned		0.4	0.8	0.6	0.8	0.9	0.8	-	-
	Production as a % of consumption (fresh only)	%	31.6	38.3	34.3	31.5	33.3	34.9	-	-
PRICES	Fresh (A)	p/lb.	11.08	11.79	11.96	13.59	13.62	15.65	-	+ 41.2
	Canned	p/lb	6.25	7.96	7.46	7.94	7.91	7.86	-	+ 25.8
	Price rcvd. by producer (fresh only) (B)	p/lb.	7.5	7.9	8.3	10.7	11.0	10.7	-	-
	B as a % of A.	%	67.7	67.0	69.4	78.7	81.0	68.2	-	-

TABLE A.12

Raspberry production, consumption and prices

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963/72
PRODUCTION	Acreage	acres	6444	6908	6943	7677	7947	8051	8323	+ 29.2
	Yield/acre	cwts	30.9	31.1	25.1	40.9	39.8	27.8	28.6	- 7.4
	Output	000 tons	10.0	10.7	8.7	15.9	15.8	11.2	11.9	+ 19.0
	Price	£/ton	110	109	147	148	150	143	155	+ 40.9
	Real price	£/ton	110	101	1275	116	111	97	98	+ 10.9
	Value	£000s	1095	1191	1284	2356	2364	1604	1835	+ 67.6
	% Total hortic. output	%	15.8	15.9	15.3	21.8	19.4	14.1	13.4	-
CONSUMPTION	Processing	tons	-	10.50	8.20	15.50	14.75	10.88	11.31	+ 7.8
	Fresh	tons	-	0.50	0.50	0.40	1.02	0.30	0.54	+ 8.0
	% of total production									
	Processing	%	-	95.5	94.3	97.5	93.5	97.3	95.0	-
	Fresh	%	-	4.5	5.7	2.5	6.5	2.7	5.0	-
PRICES	Actual									
	Processing	£/ton	-	105.4	145.9	146.8	149.9	143.5	151.5	+ 43.7
	Fresh	£/ton	-	173.5	171.5	207.9	224.0	266.0	226.1	+ 30.3
	Real									
	Processing	£/ton	-	97.4	126.6	115.4	110.8	96.9	95.9	+ 1.5
	Fresh	£/ton	-	160.3	148.8	163.4	165.5	179.6	143.1	- 10.7

TABLE A.13

Strawberry production, consumption and prices

		UNITS	1963	1965	1967	1969	1970	1971	1972	% CHANGE 1963/72
PRODUCTION	Acreage	acres	1641	1802	1847	2024	2179	2470	2412	+ 47.0
	Yield/acre	cwts	22.3	22.3	42.3	30.4	33.6	32.5	33.6	+ 50.7
	Output	000 tons	1.8	2.0	3.9	3.1	3.7	3.9	4.1	+127.8
	Price	£/ton	171	150	153	152	193	169	144	- 15.8
	Real price	£/ton	171	139	133	119	143	114	91	- 46.8
	Value	£000s	308	284	595	474	704	662	583	+ 89.3
	% Total hortic. output	%	4.4	3.8	7.1	4.4	5.8	5.8	4.2	-
CONSUMPTION	Processing	tons	-	1.0	1.8	1.6	1.5	2.6	2.8	+180.0
	Fresh	tons	-	1.0	2.1	1.5	2.1	1.3	1.3	+ 30.0
	% of total production									
	Processing	%	-	50.0	46.2	51.6	40.5	66.7	68.3	-
	Fresh	%	-	50.0	53.8	48.4	59.5	33.3	31.7	-
PRICES	Actual									
	Processing	£/ton	-	108.1	115.4	117.1	119.0	121.1	120.9	+ 11.8
	Fresh	£/ton	-	176.8	184.5	188.0	246.9	266.0	194.8	+ 10.2
	Real									
	Processing	£/ton	-	99.9	100.1	92.0	87.9	81.7	76.5	- 23.4
	Fresh	£/ton	-	163.4	160.1	147.8	182.5	179.6	123.3	- 24.5

Consumption of soft fruit products.

CONSUMPTION PER PERSON	Fresh	ozs per person per week	0.62	0.69	0.64	0.40	0.30	0.25	-	- 59.6
	Frozen Canned & Bottled		1.22	1.82	1.63	2.28	1.94	1.64	-	+ 34.4
	Jam		2.21	2.50	2.01	1.68	1.74	1.67	-	- 24.4

TABLE A.14

Amenity crops (outdoor only) production

	UNITS	1965	1967	1969	1970	1971	1972	% CHANGE*
Acreage								
Bulbs and flowers	acres	1099	681	921	1108	921	938	37.7
Roses	"		338	380	366	373	377	11.5
Trees and shrubs	"		280	385	534	516	671	139.6
Total	"		1299	1686	2008	1810	1986	52.8
Output	£000s	2117	2214	2571	3181	3554	3984	79.9
% total hortic output.	%	28.2	26.4	23.8	26.1	31.2	28.7	-

* % change 1967-1972.

TABLE A.15

Definition of regions

REGION	COUNTIES	REGION	COUNTIES
Highland	Argyll	South East	Berwick
	Inverness		East Lothian
	Ross & Cromarty		Midlothian
	Sutherland		Peebles
	Shetland		Roxburgh
			Selkirk
North East	Aberdeen		West Lothian
	Banff		
	Caithness	South West	Ayr
	Kincardine		Bute
	Moray		Dumfries
	Nairn		Dumbarton
	Orkney		Kirkcudbright
			Lanark
East Central	Angus		Renfrew
	Clackmannan		Stirling
	Fife		Wigtown
	Kinross		
	Perth		