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Lettuce - Cost of prod.



UNIVERSITY OF  
MANCHESTER

FACULTY OF ECONOMIC  
AND SOCIAL STUDIES

DEPARTMENT OF AGRICULTURAL ECONOMICS

**AN ECONOMIC SURVEY  
OF  
LETTUCE PRODUCTION  
IN THE OPEN**

JOHN E. FARRAR

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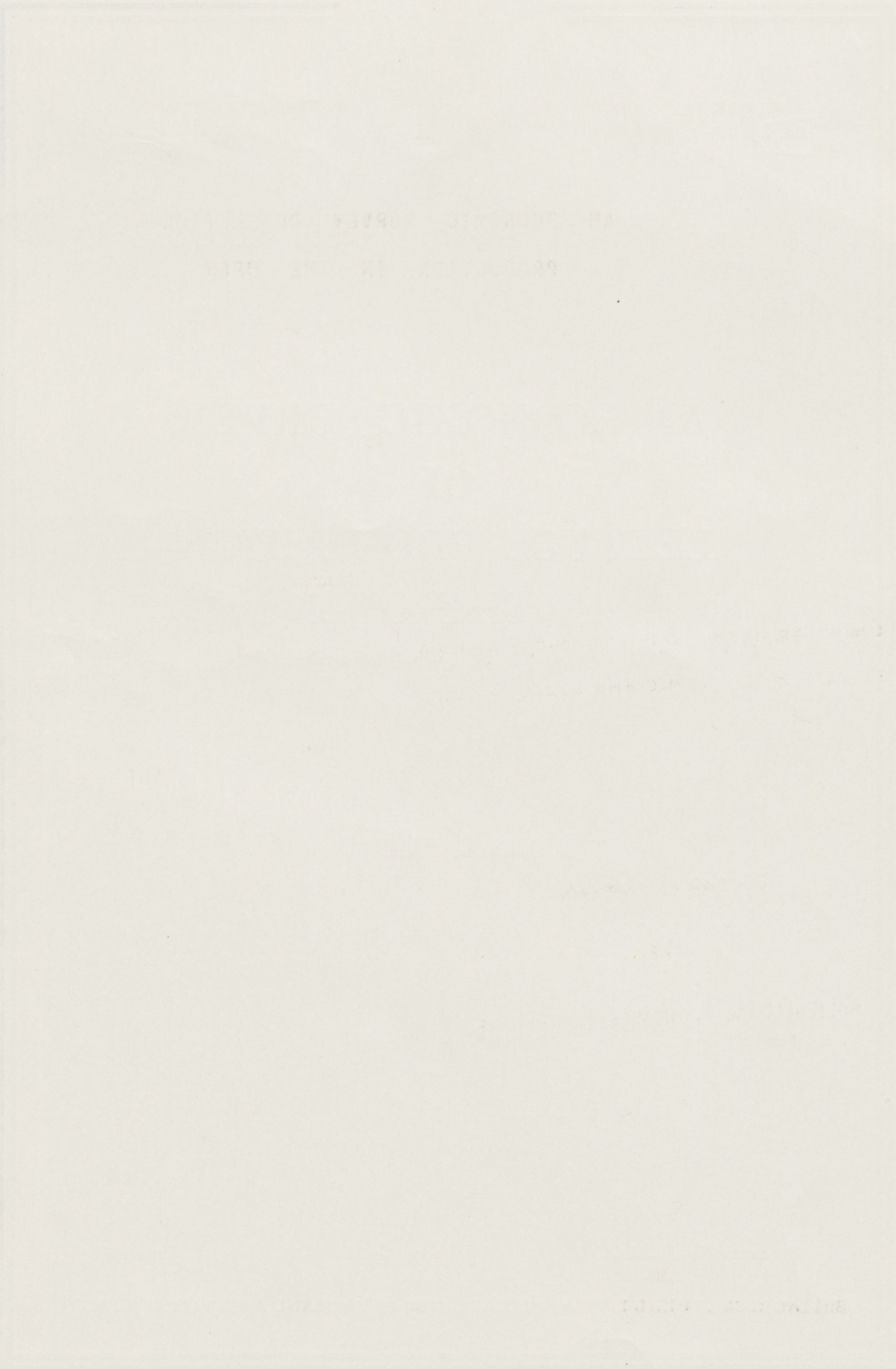
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AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES: No. 64





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AN ECONOMIC SURVEY OF LETTUCE  
PRODUCTION IN THE OPEN

by

John E. Farrar



## AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

University departments of Agricultural Economics in England and Wales have for many years undertaken economic studies of crop and livestock enterprises, receiving financial and technical support from the Ministry of Agriculture, Fisheries and Food.

The departments in different regions of the country conduct joint studies of those enterprises in which they have a particular interest. This community of interest is recognised by issuing enterprise studies reports prepared and published by individual departments in a common series entitled "Agricultural Enterprise Studies in England and Wales".

Titles of recent publications in this series and the addresses of the University departments are given at the end of the report.

## PREFACE

The field work for this report relates to the year 1975 and the Department greatly regrets the lateness of its appearance. This has been caused by a change of staffing, the original survey and analysis being the responsibility of Peter Thomson. On his departure for America, however, the work was taken over after some time by John Farrar, who is responsible for this report. Having to deal with unfamiliar material, collected by others he has been working under a considerable handicap. Moreover, much of the data was well out-of-date by the time he came to analyse it, so he has had the tedious task of trying to up-date it. It was felt, however, that growers who had given freely of their cooperation in supplying a mass of detailed information deserved something in return. It is therefore hoped that they will be glad to receive this report as a token of our gratitude for their cooperation.

W. J. Thomas  
Professor of Agricultural Economics  
and Head of the Department

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In addition his thanks also go to the computer, clerical and secretarial staff of the Department of Agricultural Economics and the Faculty of Economic and Social Studies.

CHAPTER I

INTRODUCTION

After tomatoes open grown lettuce ranks as the second most important salad crop in the U.K. in terms of value of output. In 1976/77 home production of tomatoes was worth £41.9 millions and field lettuce £27.9 millions; glasshouse lettuce with a lower output than the open grown crop was third with a value of £19.7 millions. Of the 212 thousand hectares of field vegetables (excluding potatoes) grown during the same year lettuce occupied three per cent of the area, and by acreage it was the eighth most important crop. Because of its high value lettuce accounted for ten per cent of the total value of field vegetables and was third in importance after cabbages and carrots, and on a par with Brussels sprouts, dry bulb onions, cauliflowers and green peas for processing.

As is the case with total vegetable production, the U.K. is the third largest grower of lettuce in the EEC, and home production including glasshouse lettuce presently accounts for ninety-five per cent of consumption. Italy is the main producer growing approximately twice the area of lettuce as the UK with France being fairly close behind in second place. The Netherlands and Belgium are large producers and also the main exporters, particularly of glasshouse lettuce. Much of the lettuce imported into the UK comes from these two countries as well as smaller quantities of field grown lettuce from Italy and France, and also Spain, Israel and Cyprus, at the time of the year when home grown field lettuce is either not available or in short supply.

As with most horticultural crops which are perishable in nature the production of open grown lettuce in this country is largely confined to specific areas which depend on the close proximity of a large market, and the availability of suitable soils. Because of this most of the crop is grown in the south and east of England where it is close to the London market;



in Lancashire where soil type and the proximity of the urban areas of south Lancashire both favour the growing of the crop; and in the West Midlands again due to the large markets of nearby cities.

The season for outdoor lettuce normally starts with the first supplies of overwintered lettuce coming onto the market about the middle of May. This is then followed by lettuce which has been raised under glass and then transplanted into the field, the early crops of which are usually ready for cutting by the end of May. From June onwards the bulk of outdoor lettuce is grown from drilled crops, the first sowings taking place during late March and early April, and the last sowings being in July and August for harvesting towards the end of the season in October and November. Although the overwintered crop is slightly earlier than the transplanted crop, it is of relatively poor quality and grown chiefly in favourable sheltered areas such as the Thames Valley. Possibly as a result of the extended winter glasshouse lettuce season, the proportion of lettuce which is overwintered has slowly decreased over the last twenty years or so, in favour of the more reliable transplanted crop. Ideally each grower aims to extend harvesting over as long a season as possible, to try to ensure a fairly constant supply of lettuce to his wholesaler or merchant, to utilise his labour as fully as possible, and as prices fluctuate widely according to supply and demand from one week to the next during the season, to try to avoid the possibility of having to sell much of the crop when prices are low. In order to achieve a fairly uniform supply an early overwintered crop, or a transplanted crop planted at weekly or fortnightly intervals may be grown, and during March and April the sowing of the main crop will commence at similar intervals. Successional cropping enables the market to be supplied for most of the summer. However, due to disease, over supply and low prices, or very hot weather as in 1975 and 1976 causing seed dormancy, bolting and uneven crop establishment, resultant breaks

in supply even with the best planned cropping programmes do occur. Yields of lettuce crop vary considerably and potential yields are seldom, if ever, achieved. Less than fifty per cent of the potential yield of a drilled crop is usually marketed, whereas the figure for a transplanted crop is normally better and can be in the region of eighty per cent. As the majority of the costs of growing the crop are associated with harvesting and marketing it can happen that when a batch is ready for cutting the market price is so low that it is not economically justifiable to cut the lettuce, and as in the summer of 1977 when prices were low many crops were ploughed in.

The field work for this survey was carried out in 1975, which together with 1976 was a year of exceptionally high prices for vegetables due to shortages caused by the dry summers of those years. Lettuce prices were no exception and wholesale prices in 1975 were on average nearly fifty per cent higher than in 1973 and 1974. Yields were obviously depressed, especially for the main drilled crop, but nevertheless this was usually compensated for by the high price received. An attempt has been made to update these costs and returns for 1976 and 1977, and it can be seen from these that margins declined dramatically in 1977 in comparison with those of 1975.

CHAPTER II

LETTUCE IN THE UK

Over the ten years from 1964/65 to 1973/74 the cropped area of lettuce grown in the open in the UK increased by nearly 50 per cent from 6033 hectares to 8988 hectares, and the output increased from 108,800 tonnes to 156,900 tonnes. This represented an increase in the value of the crop from £6.9 millions in 1964/65, at an average price of £63.81/tonne, to £23.5 millions in 1973/74, at a price of £150.10/tonne. Since 1974 the cropped area has decreased, largely due to the drought conditions of the summers of 1975 and 1976 which prevented growers from taking more than one crop from the same acreage, and causing crop failures. Although the cropped area fell to 6936 hectares in 1975/76 with an output of 115,000 tonnes, the total value at £251.62/tonne rose to £28.9 millions. In 1976/77 the forecasted area was 7386 hectares and a tonnage of 106,000 tonnes.

TABLE 1: Area and Output of Open Grown Lettuce in UK

Year	Estimated Cropped area ha.*	Estimated Output '000 tonnes	Estimated Value £000's	Value/tonne	Tonnes/hectare
1964/65	6033	108.8	6943	63.81	n.a.
1965/66	6430	108.3	7028	64.89	n.a.
1966/67	6709	123.8	9786	78.99	n.a.
1967/68	6532	115.3	8736	75.75	18.71
1968/69	7252	106.8	9504	89.00	16.99
1969/70	7381	111.0	10371	93.47	16.80
1970/71	8188	138.4	12091	86.86	18.51
1971/72	7909	130.7	12937	99.01	18.50
1972/73	8035	139.4	13513	96.93	18.93
1973/74	8988	156.9	23547	150.10	19.01
1974/75	8512	148.6	21787	146.62	19.14
1975/76 (Prov.)	6936	115.0	28936	251.62	17.86
1976/77 (Forecast)	7386	106.0	27857	262.80	15.15

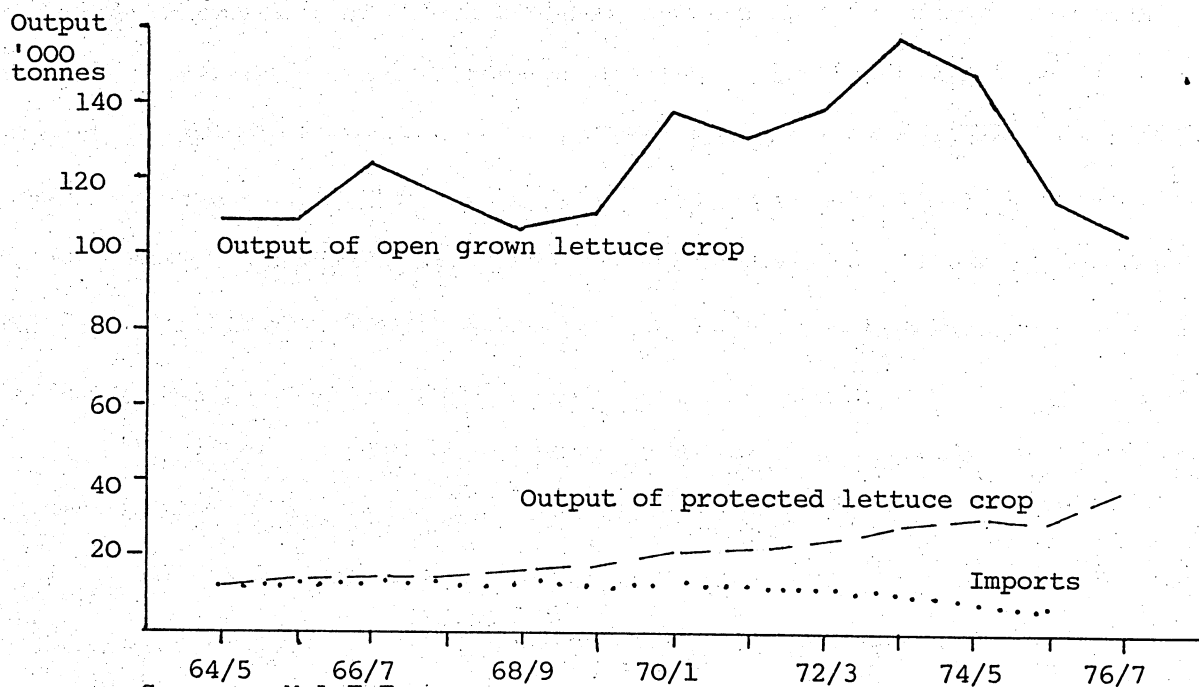
\* With allowances for double cropping, crop failures, etc.

SOURCE: M.A.F.F.



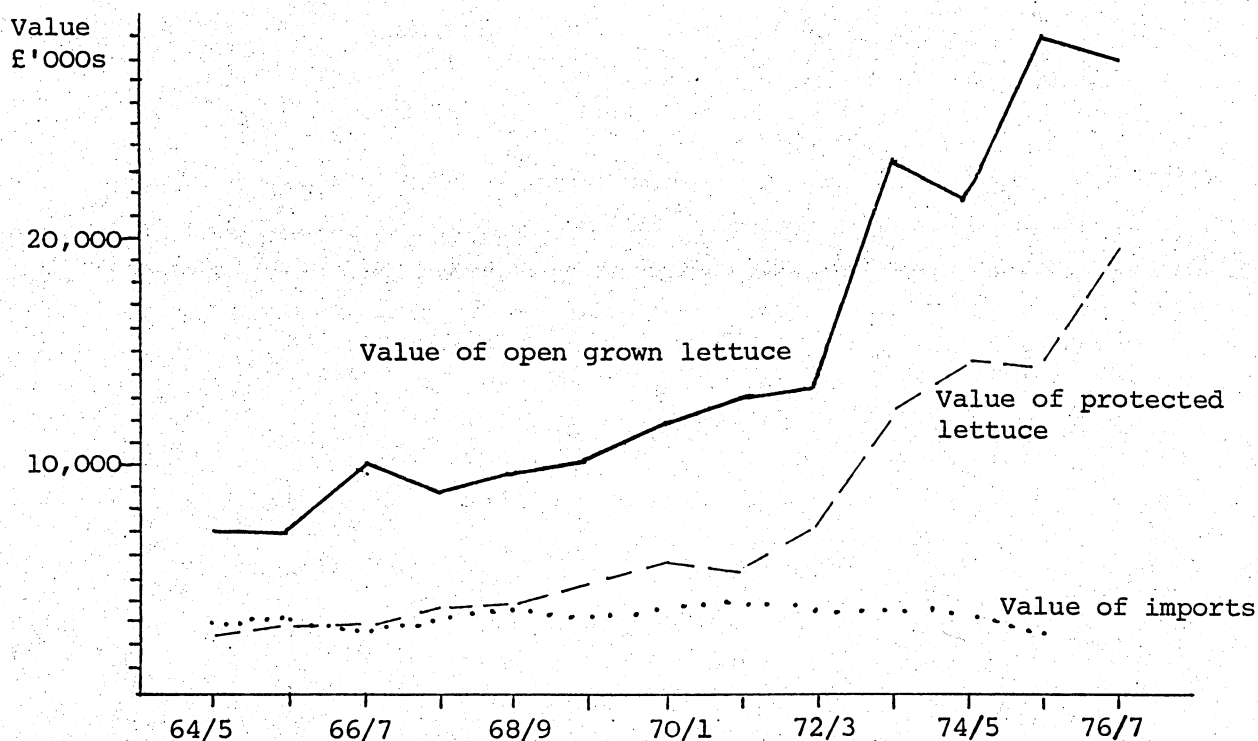
Over the same period of time the production of lettuce under glass in the UK has increased two and a quarter times from 657 hectares in 1964/65 giving an output of 11,900 tonnes and a value of £2.5 millions, to a forecast of 1,479 hectares for 1976/77 with an output of 38,200 tonnes and a value of £19.7 millions. The bulk of the glasshouse lettuce crop is marketed between October and May with most of the production occurring during April and May, although in recent years there has been a swing by a few large glasshouse growers to all year round lettuce production. Again over the same ten year period the amount of lettuce imported into the UK has decreased from 11,900 tonnes in 1964/65 to 5,300 tonnes in 1975/76, and the value from £2.8 millions to £2.7 millions respectively. Imports enter the country over the winter months and therefore compete directly with home grown glasshouse lettuce and only the earliest of the outdoor crop.

The following graphs show the relative importance of open grown lettuce compared with production under glass and imports.



Source: M.A.F.F.

Output of Home Grown Open and Glasshouse Lettuce, and the Quantity of Imports



SOURCE: M.A.F.F.

Value of Home Grown Open and Glasshouse Lettuce and Imports

The amount of lettuce grown and imported has increased from 132,600 tonnes in 1964/65 to 194,700 tonnes in 1973/74. This was followed by a decrease to 186,500 tonnes in 1974/75 and a further decrease to 149,400 tonnes in 1975/76. However the percentage share of the total quantity has, in the case of open grown lettuce, only decreased significantly in the last two years, i.e. 1975/76 and 1976/77, this probably largely due to the dry weather during the summer of these years. Meanwhile the share going to protected lettuce over the last decade has increased from 9 per cent to 19 per cent, and the share to imports decreased from 9 to 4 per cent over the same period. The percentage share of the total value for open grown lettuce has remained fairly much the same at around the 55-60 per cent figure; but the share to protected lettuce has increased from 21 to 32 per cent and for imported lettuce decreased from 23 to 6 per cent. So while it can be seen that the share of the market has decreased slightly for

the open grown lettuce, in terms of tonnage, the increase in the amount of protected lettuce has largely been out of season at the expense of imported lettuce.

Distribution of Production of Open Lettuce in England and Wales

TABLE 2: Distribution of Production by M.A.F.F. Regions (Hectares)

	1965	1970	1971	1972	1973	1974	1975	1976
England and Wales	3692	4934	4931	4962	4742	4609	4172	4140
East	831	1244	1213	1271	1202	1106	890	859
Southeast	1061	1227	1220	1192	1133	1059	976	947
East Midlands	183	233	280	267	252	196	290	284
West Midlands	432	582	558	561	520	590	523	518
Southwest	209	313	327	324	294	349	290	302
North	92	130	129	122	121	134	115	117
Yorkshire and Lancashire	822	1114	1116	1145	1138	1097	1017	1052
England	3630	4843	4843	4882	4660	4531	4101	4079
Wales	62	91	88	80	82	78	71	61

SOURCE: M.A.F.F., June Census

The change in boundaries which occurred in 1974 mean that figures upto and including 1973 may not strictly be comparable with those thereafter. Nevertheless, as with the UK production figures, it can be seen that between 1965 and 1970 there was quite a dramatic increase in production, when the area of open grown lettuce recorded in June in England and Wales increased by one third to 4934 hectares. The area remained at this level until 1972 and then declined to 4609 hectares in 1974, and finally dropped to 4140 hectares in 1976.

The three main regions of production are the Eastern Region, the South eastern region and the Yorkshire/Lancashire region, which in 1976 had 21 per cent

23 per cent and 25 per cent of the total area in England and Wales respectively.

The counties with the largest areas of open grown lettuce are shown in the following table.

TABLE 3: Area to Open Grown Lettuce in the Major Growing Counties (Hectares)

	1974		1975		1976	
	Area	%	Area	%	Area	%
Lancashire	447	9.7	412	9.9	458	11.1
Greater Manchester	267	5.8	256	6.1	262	6.3
Merseyside	72	1.6	60	1.4	55	1.3
(Total 'Lancashire')	(786)	(17.1)	(728)	(17.4)	(775)	(18.7)
Bedfordshire	293	6.4	295	7.1	283	6.8
Kent	242	5.3	202	4.8	228	5.5
Surrey	239	5.2	229	5.5	222	5.4
Norfolk	222	4.8	208	5.0	179	4.3
Cheshire	193	4.2	183	4.4	176	4.3
Worcester	175	3.8	165	4.0	167	4.0
Total	2150	46.8	2010	48.2	2030	49.0
England and Wales	4609	100.0	4172	100.0	4140	100.0

SOURCE: M.A.F.F.

Some noticeable changes in areas of production have occurred within the last 20 to 30 years. In 1951 the south eastern region accounted for approximately 40 per cent of the acreage of open grown lettuce in England and Wales, however, due largely to urban development around London and also the change in cropping from vegetables to nursery stock on the market garden type holdings, the acreage has now decreased to its present level of 23 per cent. Production in Lancashire has steadily increased and since 1951 the acreage of the crop has grown by over 50 per cent. Lancashire now has a larger area of open grown lettuce than any other county; the county itself growing 11.1 per cent of the total area, and if Greater Manchester and Merseyside are included then nearly

one fifth of the crop in England and Wales is grown within the old Lancashire boundary. Although the proportion of the total acreage grown in the eastern region has remained fairly much the same over the last 20 to 30 years there have been marked changes within the region. The amount of open grown lettuce in Essex and Hertfordshire has declined steadily but this has been compensated for by an increase in the acreage grown particularly in Bedfordshire and Norfolk which now grow 6.8 and 4.3 per cent of the England and Wales crop respectively.

Yields

TABLE 4: Estimated Gross Yields of Outdoor Lettuce in Selected Areas  
(tonnes per hectare)

	1973	1974	1975	1976	1977 (prov.)
(a) Summer and Autumn Crops:					
Beds. and Hunts.	22.7	20.7	18.3	15.0	21.3
Kent	15.1	12.1	13.1	13.0	15.0
Lancs, Manchester, Merseyside	21.7	21.2	22.1	16.0	28.5
Norfolk West	18.9	17.6	15.1	15.0	17.5
Surrey	27.7	25.2	21.8	25.0	22.0
Worcs., Hereford, Warwick	20.2	20.2	17.8	18.0	20.0
(b) Overwintered Crops:					
Beds. and Hunts.	12.6	12.8	13.6	8.8	7.5
Kent	5.8	6.3	8.8	8.0	9.1
Surrey	-	12.6	15.1	15.1	22.0
Worcs., Hereford, Warwick	13.9	13.6	12.6	17.6	6.0

SOURCE: M.A.F.F., Horticultural Crop Intelligence

The yield figures for the summer and autumn crops show quite markedly the effect of the two dry years of 1975 and 1976. In comparison with the average

yields for 1973 and 1974, the yields in 1975 were down by as much as 18 per cent in Surrey, 17 per cent in Norfolk and 16 per cent in Bedfordshire and Huntingdonshire, in Kent the yield dropped by only 4 per cent on average, and actually showed a slight increase over the 1974 figures as did yields in Lancashire. The 1976 yields show a more noticeable drop, and again in comparison with an average of 1973 and 1974 figures, yields in Bedfordshire and Huntingdonshire fell by 31 per cent, Lancashire by 26 per cent and Norfolk by 18 per cent. In this last year yields have returned to what they were prior to 1975 and in some cases even more. In Lancashire yields increased by 33 per cent compared with 1973/74 yields.

Yields for the overwintered crop show quite a varied set of results, which is probably to be expected as much depends on the conditions at sowing, the weather over the winter and conditions in the spring. In Kent the yields have been consistently low in comparison with other areas, although in the last two years in Bedfordshire and Huntingdonshire and the Worcester area have fallen to a similar level, largely as a result of wet soil conditions.

### Prices

The graphs on the following page show the "most usual" wholesale price for a dozen lettuce as reported by the Government Statistical Service in their Agricultural Market Report.

At first glance there appears to be no set pattern from one year to the next, other than that prices tend to start off high with the first supplies of overwintered and early transplanted lettuces coming onto the market in May, the prices then steadily decline but usually pick up again in the middle of the summer in July and August, when demand is at its peak.

It is interesting to compare one year with another; 1973 and 1974 follow roughly the same trend to start with, but whereas in 1973 there was a marked increase in value in August this did not occur in 1974. The increase in price in August 1973 was largely due to hot dry weather in the month causing a

Average Monthly Prices of Outdoor

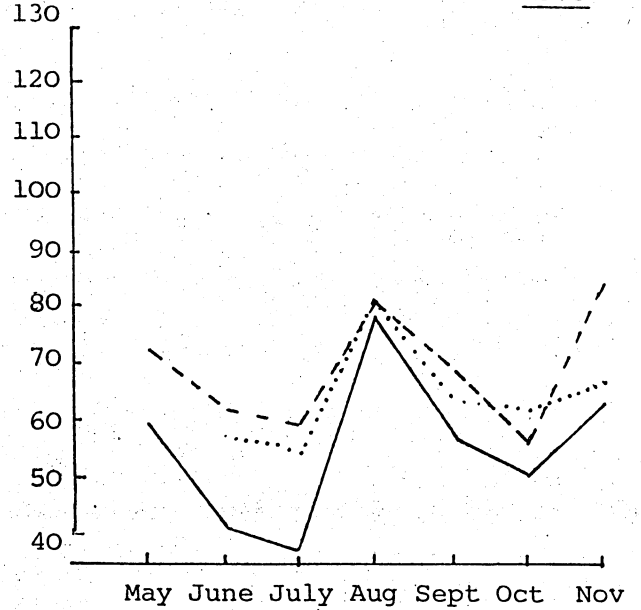
Lettuce, (Pence per dozen)

— Cabbage  
..... Crisp  
- - - - Cos

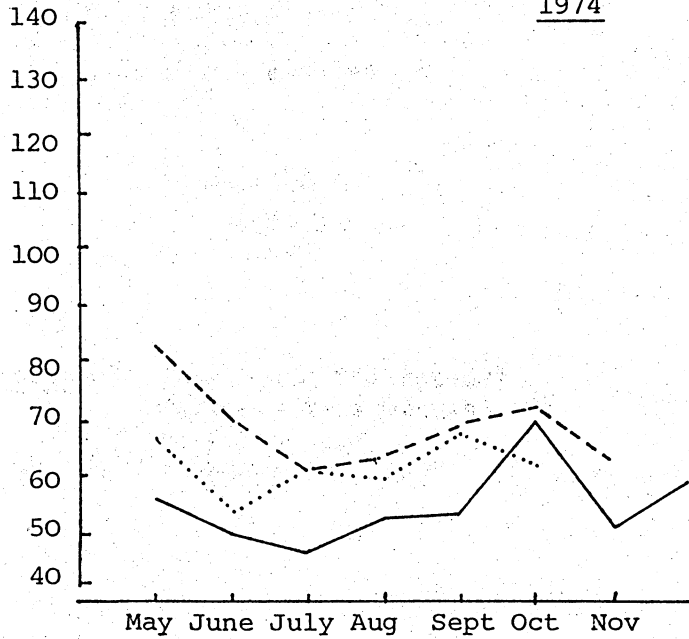
Source: Government Statistical Service, Agricultural Market Report.

Pence

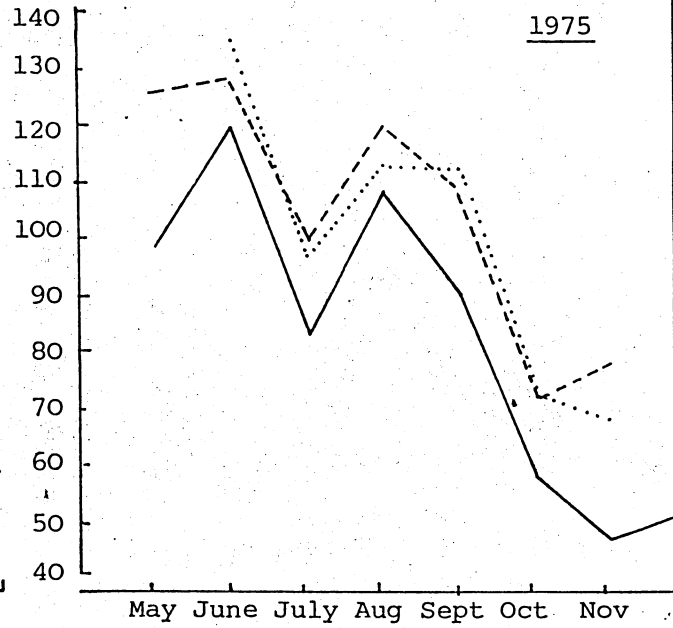
1973



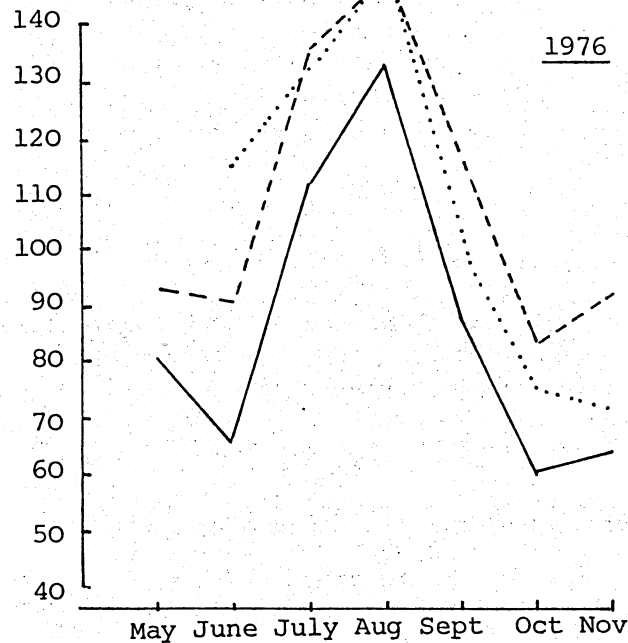
1974



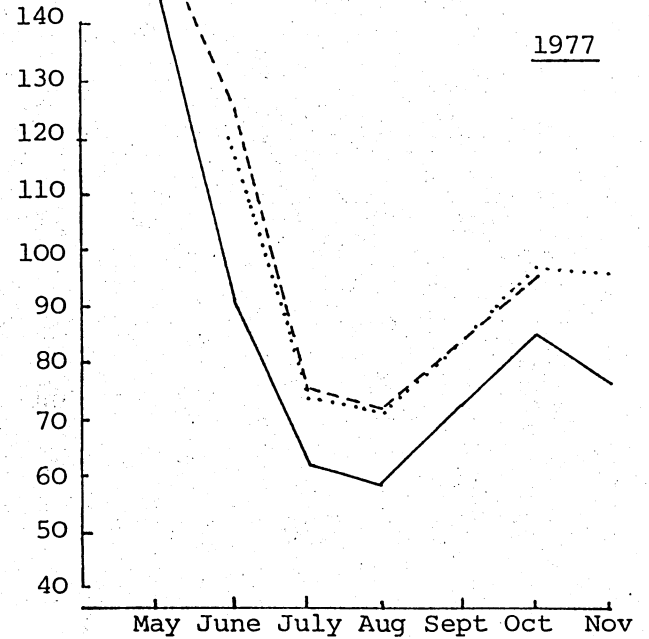
1975



1976



1977





scarcity in supply coupled with a high demand for salad foods. In contrast, in 1974 there were ample supplies of summer lettuce while demand was not particularly good, and as a result prices remained much the same from June to the end of the season.

In 1975 the prices remained high until July because of short supplies caused by the poor growing conditions in the wet spring, which retarded overwintered crops and delayed sowings for the summer crop. In July prices fell as supplies of summer lettuce became more plentiful. However the hot weather of that summer increased demand and the drought conditions caused problems for growers, with tipburn and bolting being common, both these factors contributing to the increase in price in August and September. From September as the cooler weather approached so prices declined with the last supplies of cos and crisp finishing in November and the cabbage lettuce tailing off in December.

In 1976, prices of the early lettuces declined in June, largely as a result of plentiful supplies and a slack demand. The overwintered crop finished at the end of June and thereafter because of the extremely dry conditions causing problems, as in the summer of the previous year, prices rose sharply to a peak in August. The drought caused poor germination and the progress of later sowings was very variable, again tipburn and bolting were widespread and with other problems such as sliming, aphid and cut worm the condition of the crop was generally poor. Rain which came in September improved the quality of the crops but as usual at this time of the year demand decreased and prices fell sharply with supplies finishing in November.

In contrast with the years 1975 and 1976, 1977 prices showed a completely different pattern. Prices started very high in May after cold wet weather in the winter and spring had checked the development of overwintered lettuce, and spring plantings and sowings had been delayed. As the summer progressed so the quality of the crop improved and some excellent crops were

available. However, because of the cold weather demand was poor and as prices slumped many crops were ploughed in. In September, quality was generally good for the time of year and, helped by a slight increase in demand, the price rose slightly.

It can be seen then that prices farmers receive for their crop fluctuate wildly not only from one year to the next but also from one week to the next. This variation being entirely due to the balance between supply and demand, which in turn is affected by the type of season.

#### Household Consumption of Leafy Salads

The annual consumption of leafy salads has remained virtually static over the last decade at around 1.9 kg per head per year. At the same time the seasonal consumption has altered very little, with about 20 per cent in the winter months from October to March, and 80 per cent from April to September. Expenditure per head increased from 38 pence per head per year in 1965 to remain at about 46 pence from 1966 until 1970, this was followed by a steady increase to 69 pence in 1974, and then a jump to 98 pence in 1975 and then back a little to 94 pence in 1976.

TABLE 5: Consumption and Expenditure on Leafy Salads in UK  
(kg. per head and pence per head)

	1965	1967	1969	1971	1973	1974	1975	1976
<b>Consumption:</b>								
Year	1.8	1.9	1.9	1.9	2.0	1.9	2.0	1.9
1st quarter	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.2
2nd quarter	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.8
3rd quarter	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.7
4th quarter	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
<b>Expenditure:</b>								
Year	38.3	46.3	45.2	51.1	66.0	68.6	97.8	94.1

SOURCE: M.A.F.F., National Food Survey

CHAPTER III

THE SAMPLE: TYPES OF FARMS AND METHODS OF PRODUCTION

In all, 34 farms cooperated in the survey which was limited to farms growing over 2 hectares of field lettuce. This meant that the sample was probably not particularly representative of all lettuce growers, and the majority of farms which took part were either very large and growing a wide variety of vegetables (especially those in the southern and eastern counties), or were relatively small (up to 15 hectares) and virtually monocropping with lettuce, as was the case on many of the Lancashire farms.

Table 6 gives an indication of the types and size of farms in the survey.

TABLE 6: Average sizes of farms in the sample and the types of crops grown

(all figures are in hectares)

	Manchester	Southport	Middlesex/ Surrey	Norfolk/ Bedford	Kent
No. of Farms	9	8	5	5	7
Cropped area (1)	22	26	79	83	113
Lettuce	13	10	28	24	11
Potatoes	1	1	-	11	3
Brassicas	1	3	24	2	17
Other Vegetables	6	6	31	40	20
Fruit	-	-	-	-	14
Cereals	3	8	-	17	35
Grass	-	1	2	4	11
Other	-	-	-	2	4
Total (2)	24	29	85	100	115

The cropped area (1) will differ from the total area (2) which is the sum of the areas of each crop grown, due to double cropping of part of the lettuce acreage as well as other vegetable crops. All the Lancashire farms were

situated on the moss soils, most of the Manchester crops being grown on Chat Moss, and the Southport crops on the coastal mosses of Hesketh Bank, Tarleton and North Meols. With the exception of a few of the larger farms which had about half their acreage down to cereals, the majority grew only vegetables, the most important by area being lettuce, followed by celery.

Farms in Middlesex and Surrey were largely situated in the Thames Valley on light to medium loams. As with the Lancashire farms these were specialist vegetable producers but were considerably larger units, growing 28 hectares of lettuce on average, 24 hectares of brassicas and 31 hectares of a wide variety of mixed vegetables.

The Norfolk and Bedfordshire farms tended to be similar to the Thames Valley farms but whereas relatively few brassicas were grown, there was more emphasis on potatoes and cereals.

The Kent farms were the largest and probably the most diversified in the sample. Although the acreage of lettuce grown per farm as proportionately less important than in other areas, three farms had over 40 hectares of cereals, and on average 14 hectares of fruit were grown.

The lettuce crops were divided into three main types:

- A. Lettuce raised in protected environments and transplanted in the field.
- B. Lettuce grown in the open in spring or early summer. There were two subdivisions:
  - 1. Lettuce sown and later thinned.
  - 2. Lettuce precision drilled.
- C. Lettuce sown in the autumn and overwintered to produce an early spring crop.

Despite the two subdivisions in group B, few of the precision drilled crops were sown to a stand and with most, as with the drilled and thinned category, hand thinning was necessary. Most farmers grew lettuce on more than one system and the 34 farms grew 62 different crops, which were all costed individually. The following table shows the distribution of the types of crops grown.

TABLE 7: Types of lettuce crops grown

Region	No. of farms in area	No. of farms growing each type of crop			
		Transplanted	Drilled & thinned	Precision drilled	Overwintered
Greater Manchester	9	8	-	9	-
Southport Area	8	7	-	7	-
Middlesex/Surrey	5	3	-	4	5
Norfolk/Bedford	5	2	3	2	-
Kent	7	3	4	5	-
Total	34	23	7	27	5

The 34 farms grew 530 hectares of lettuce, 37 per cent of the area being in Lancashire (15 per cent in the Southport area and 22 per cent in the Greater Manchester area), 27 per cent in Middlesex and Surrey, 23 per cent in Norfolk and Bedford, and 13 per cent in Kent. The average area grown per farm was lower in the two Lancashire areas (9.1 hectares in the Southport area and 11.6 hectares in Greater Manchester), and in Kent (9.8 hectares), than in the two other areas which included some quite large growers.

TABLE 8: Average area of lettuce grown - hectares

Region	No. of Farms	Hectares to Lettuce	Hectares Grown	Average area of each type of crop				
				Transplanted	Drilled & thinned	Precision drilled	Overwintered	
Southport	8	Total	72.5	76.9	11.7	-	65.2	-
		Ave/Farm	9.1	9.6	1.5	-	8.1	-
Manchester	9	Total	104.0	117.4	49.4	-	68.0	-
		Ave/Farm	11.6	13.0	5.5	-	7.5	-
Middlesex/Surrey	5	Total	106.7	140.9	15.4	-	86.1	39.4
		Ave/Farm	21.3	28.2	3.1	-	17.2	7.9
Norfolk/Bedford	5	Total	85.2	120.6	4.4	10.1	106.1	-
		Ave/Farm	17.0	24.1	0.9	2.0	21.2	-
Kent	7	Total	68.9	74.1	5.3	34.8	34.0	-
		Ave/Farm	9.8	10.6	0.8	5.0	4.8	-
All Farms	34	Total	437.3	529.9	86.2	44.9	359.4	39.4
		Ave/Farm	12.9	15.6	2.5	1.3	10.6	1.2

In Lancashire all but one of the farms grew lettuce on two systems, usually a small area of early lettuce was grown from plants raised under glass and then followed by a larger precision drilled acreage, the earlier transplanted crop being grown on a larger scale on farms in the Manchester area than in the Southport area. The Middlesex and Surrey area included five farms which were the only ones in the sample to grow overwintered lettuce, in addition three grew an early transplanted crop, and on all but one farm a crop of spring sown lettuce followed either the overwintered crop or the transplanted crop. In the two other areas i.e. Norfolk/Bedford and Kent, only a small acreage of transplanted lettuce was grown on five of the farms, the majority of the acreage being sown in the spring and summer.

The 34 farms had an average area down to lettuce of 12.9 hectares but because of double cropping the average area of lettuce grown was 15.6 hectares. Of the 15.6 hectares, 68 per cent was grown from precision drilled seed, 16 per cent was transplanted, 8 per cent from seed sown and later thinned and a further 8 per cent was overwintered.

The lettuce grown can be sub-divided into three types i.e. cos, crisp or curly and cabbage. The following table shows the distribution of the different types of lettuce grown according to region and system of growing.

TABLE 9: Types of lettuce grown

Region	System	Area Grown (hectares)	Percentage of Area		
			Cos	Crisp	Cabbage
Southport	Transplanted	11.7	25	51	24
	Precision drilled	65.2	4	78	18
Manchester	Transplanted	49.4	82	13	5
	Precision drilled	68.0	48	29	23
Middlesex/ Surrey	Transplanted	15.4	40	7	53
	Precision drilled	86.1	8	31	61
	Overwintered	39.4	6	37	57
Norfolk/ Bedford	Transplanted	4.4	3	-	97
	Drilled and thinned	10.1	-	18	82
	Precision drilled	106.1	34	22	44
Kent	Transplanted	5.3	3	17	80
	Drilled and thinned	34.8	1	9	90
	Precision drilled	34.0	9	17	74

On farms in the two Lancashire areas a far larger proportion of cos and crisp lettuce was grown than in other regions. The moss soils of South West Lancashire being particularly suitable for these types of lettuce which need more water than the hardier cabbage type. Greater Manchester is a traditional cos growing area and over 80 per cent of the early transplanted crop and nearly 50 per cent of the spring and summer sown crop was of this type. The farms costed in the Southport area grew more of the crisp varieties, 78 per cent of the major spring and summer sown acreage being crisp lettuce, and in contrast with Manchester cabbage lettuce being more widely grown than the cos type. Lettuce grown by the farms in the other three areas, in the south and east of the country, was mainly of the cabbage type, with the crisp varieties taking second place. Cos lettuce were only grown to a significant extent in Norfolk and Bedford from spring and summer sowings, and to a lesser degree in Middlesex and Surrey, from transplanted plants.

On the farms in the survey the bed system of growing was by far the most popular and all but six of the crops were grown by this method. Tractor wheel widths were generally dictated by the overall type of cropping of each farm and varied from 52 to 76 inches (132 to 193 cm). The Lancashire crops were grown on the narrower bed widths with three but more usually four rows per bed. Bed widths in the Southport area varied between 54 and 60 inches (137 and 152 cm) and were narrower than the widths of 60 to 68 inches (152 to 173 cm) adopted by growers in the Manchester area, because of the larger nature of the cos type lettuce which was so widely grown on the Manchester farms. In general crops grown by this method in the south and east of the country were grown on wider bed widths than in Lancashire with 72 and 76 inch widths (183 and 193 cm) being the most popular, and five or six rows per bed. Spacings between plants in the rows varied very little, the most usual being between 8 and 10 inches (20 and 25 cm), the only exception being on the farms in Middlesex and Surrey where it was between 12 and 13 inches (30 and 33 cm). Of the six crops not



grown on the bed system, all of which were in the Norfolk and Bedfordshire area, the distance between rows varied from 14 to 20 inches (36 to 51 cm), and the spacing between plants from 11 to 12 inches (28 to 30 cm).

CHAPTER IV

ANALYSIS OF THE SURVEY DATA

Table 10 shows the average results for farms growing lettuce on each of the four systems identified. The variable costs were collected for all the crops as was a record of the labour and tractor hours. Yield and price data was not available for some of the crops, consequently an average price per dozen lettuce was calculated from those farms where information was complete for each of the four groups, and this was then applied to the average yield of all farms with yield data in each group. It should be remembered that returns from the lettuce crop were recorded net of packaging and marketing costs and that together these items represent the major cost in producing lettuce. This aspect of the costs will be dealt with later.

Tables 11 and 12 show the average results for farms in each of the three main areas (because of the large number of farms in Lancashire, two separate areas were identified i.e. the Southport area and the Manchester area; and due to the small number of farms in the Kent, Middlesex and Norfolk areas these have been treated as one group - the South and East group), growing the two major types of crop i.e. the transplanted crop (system A) and the precision drilled crop (system B<sub>2</sub>). Of the two numerically lesser important types of crops, the sown and thinned crop and the overwintered crop, the former was only grown on 7 farms in Kent and Norfolk and consequently these have been analysed together, and as with the 5 farms growing the latter, which were all in the Middlesex area, the results appear in the first table.

Variable Costs

In every case the 1975 results have been updated to 1976 and 1977. A summary of the indices used is given in Appendix II.

TABLE 10: Average Margins According to System of Growing (1975 Crop)

£ per Hectare

System	Transplanted Crop A	Sown and Later Thinned B <sub>1</sub>	Precision Drilled Crop B <sub>2</sub>	Overwintered Crop C
Number of Farms	23	7	27	5
Variable Costs:				
Seed	18.43	26.46	25.88	22.28
Fertilizer	73.85	84.37	69.60	63.94
Herbicide	9.27	14.76	18.61	21.73
Pesticide	7.90	13.95	10.15	12.27
Fungicide	7.42	2.98	5.22	16.73
Heating	14.62	-	-	-
Peat and Compost	51.49	-	-	-
Sterilization	2.60	-	-	-
Contract	1.60	3.52	3.76	-
F.Y.M. and Lime	10.97	-	9.28	11.42
Other	15.90	2.30	2.00	-
Total	214.05	148.34	144.50	148.37
Return, net of Marketing and Packaging	3368.00	2165.00	1876.00	2274.00
Gross Margin	3153.95	2016.66	1731.50	2125.63
Fixed Costs:				
Labour	625.00	352.00	296.00	398.00
Tractor and Machinery	107.14	50.59	69.94	71.42
Rent and Land Expenses	52.90	52.90	52.90	52.90
General Overheads	11.00	11.00	11.00	11.00
Total	796.04	466.49	429.84	533.32
Net Margin per Hectare	2357.91	1550.17	1301.66	1592.31
(Net Margin per Acre)	(954.62)	(627.60)	(526.99)	(644.66)

TABLE 11: Average Margins for the Transplanted Crop (System A) by Region  
(1975 Crop), £ per Hectare

	Southport	Manchester	South and East
Number of Farms	7	8	8
Variable Costs:			
Seed	16.54	9.36	30.88
Fertilizer	62.86	78.13	79.19
Herbicide	1.98	11.09	13.84
Pesticide	5.93	8.50	9.02
Fungicide	10.63	0.13	11.90
Heating	10.29	14.86	15.84
Peat and Compost	58.43	2.83	89.41
Sterilization	7.31	1.02	-
Contract	1.30	-	3.47
F.Y.M. and Lime	13.97	14.47	11.43
Other	2.26	0.58	43.08
Total	191.50	140.97	308.06
Return, Net of Marketing and Packaging	3457.00	3084.00	3573.00
Gross Margin	3265.50	2943.03	3264.94
Fixed Costs:			
Labour	619.00	620.00	641.00
Tractor and Machinery	75.89	142.85	99.70
Rent and Land Expenses	52.90	52.90	52.90
General Overheads	11.00	11.00	11.00
Total	758.79	826.75	804.60
Net Margin per Hectare	2506.71	2116.28	2460.34
(Net Margin per Acre)	(1014.86)	(856.79)	(996.09)

**TABLE 12: Average Margins for the Spring/Summer Precision Drilled Crop**  
(System B<sub>2</sub>) by Region (1975 Crop), £ per Hectare

	Southport	Manchester	South and East
Number of Farms	7	9	11
Variable Costs:			
Seed	28.54	17.85	30.75
Fertilizer	61.22	71.92	66.70
Herbicide	21.03	18.38	17.26
Pesticide	12.16	9.86	9.10
Fungicide	6.41	0.85	8.04
Contract	1.06	1.40	7.41
F.Y.M. and Lime	14.36	2.50	10.32
Other	0.42	0.34	5.70
Total	145.20	123.10	155.28
Return, Net of Marketing and Packaging	1873.00	2184.00	1630.00
Gross Margin	1727.80	2060.90	1474.72
Fixed Costs:			
Labour	283.00	264.00	331.00
Tractor and Machinery	59.52	84.82	63.98
Rent and Land Expenses	52.90	52.90	52.90
General Overheads	11.00	11.00	11.00
Total	406.42	412.72	458.88
Net Margin per Hectare	1321.38	1648.18	1015.84
(Net Margin per Acre)	(534.97)	(667.28)	(411.27)

1. Seeds and Varieties

The main varieties grown on the farms in the survey are listed below.

<u>Cabbage</u>	<u>Crisp</u>	<u>Cos</u>
Avondefiance	Avoncrisp	Lobjoit's Green
Cobham Green	Great Lakes	Valmain
Hilde	Pennlake	Vaux's self-folding
Kares	Webbs Wonderful	
Mildura		
Plena		
Reskia		
Spring Market		
Supermarket		
Suzan		
Valdor		

A wide selection of cabbage varieties was grown, but there was no indication of any preference for a particular variety for a specific area or system of growing, with the exception of Valdor which was the main autumn sown variety. Pennlake was the most popular and widely grown crisp variety, and Lobjoit's Green accounted for the majority of the cos acreage.

Of the 62 crops costed, 32 were grown from pelleted seed and 30 from natural seed. Pelleted seed predominated in importance in the precision drilled crop and of the 27 crops in the group only 5 were grown from natural seed. In the transplanted group, 14 of the crops were grown from natural seed, 7 from pelleted seed and 2 from split pills; all the crops in the sown and later thinned category were grown from natural seed as were all but one of the overwintered crops.

Seed rates and cost varied enormously from one farm to another, in the transplanted crop pelleted seed varied between £1.32 and £2.20 per Kg. in cost, and seed rates from 5.6 to 10.1 Kg/Ha; natural seed varied from £17.60 to £35.20 per Kg. in cost and seed rates from 0.1 to 1.4 Kg/Ha. In the three drilled crops pelleted seed varied between £1.28 and £6.38 per Kg. and seed

rates from 4.3 to 37.7 Kg/Ha.; natural seed varied between £17.60 and £59.02 per Kg. and seed rates from 0.6 to 1.7 Kg/Ha. The difference in the various seed rates and costs is particularly noticeable when comparing the costs of the precision drilled and the transplanted crops incurred in the three different areas. In the Manchester area where the predominant type of lettuce is the cos, the seed rate was substantially lower in the precision drilled crop than in other areas where crisp and cabbage lettuce predominate, (8.7 Kg. per hectare in the Manchester area and 18.3 Kg. per hectare in the Southport area, for pelleted seed). The low cost of seed on the Manchester farms for the transplanted crop was due to most of the plants being raised from natural seed as opposed to the more expensive pelleted seed; and the high cost of seed on crops in the South and East being due to a few of the crops being grown from split pills.

TABLE 13: Average seed rates and costs

System	No. of Farms	Seed Rate (Kg/Ha)	Cost 1975 (£/Kg)	£/Ha 1975	£/Ha 1976	£/Ha 1977
A (Natural seed)	14	0.5	21.30	10.70	10.70	19.50
A (Pelleted seed)	7	8.2	1.60	13.10	15.30	19.70
A (Split pills)	2	75.1 thous./ha	1.00/th	75.10	120.20	135.20
B <sub>1</sub> (Natural seed)	7	1.1	24.00	26.40	26.40	48.00
B <sub>2</sub> (Natural seed)	5	0.8	24.00	19.20	19.20	34.90
B <sub>2</sub> (Pelleted seed)	22	12.0	2.70	32.40	37.80	48.60
C (Natural seed)	4	1.2	19.30	23.20	23.20	42.20
C (Pelleted seed)	1	14.0	2.00	28.00	32.70	42.00



2. Fertilizers

TABLE 14: Average fertilizer applications and costs

	N P K (Kg per ha)			Cost, including foliar feed (£ per ha)		
				1975	1976	1977
Transplanted (A)	132	84	158	73.85	78.10	88.30
Sown and thinned (B <sub>1</sub> )	131	88	157	84.37	89.30	100.90
Precision drilled (B <sub>2</sub> )	133	85	157	69.60	73.60	83.20
Overwintered (C)	124	23	116	63.94	67.60	76.50

The averages for the first three groups are almost identical with very little variation from one farm to another, the most usual application consisted of either 800 Kg/ha of a low phosphate/high potassium fertilizer such as 17.8.24; or a dressing of about 750 Kg/ha of a high potassium fertilizer such as 10.10.18, which was often followed by a second dressing of 200 Kg/ha of a straight 34.5 per cent nitrogen fertilizer. The fertilizer applications on the five overwintered crops was lower, the main difference being in the amount of phosphate used; three of the farms used no phosphate fertilizer and two only small amounts. Farm yard manure, which was usually purchased, was spread prior to cultivations on one quarter of the 62 crops costed, and on most of the other farms manuring took place at some point in the rotation.

In addition to the fertilizer applications in the seed bed, five of the transplanted crops, four of the precision drilled crops and one of the overwintered crops were sprayed with a foliar feed. Applications varied from one to three times, and the average cost of material per application came to £5.10 per hectare.

3. Chemicals

(a) Herbicides

In almost every case the cost of sprays for weed control was greater than

those for pest or disease control. The type of chemical used varied more according to the area than to the type of crop grown, largely because of soil type, although, in general, the applications of herbicides on the transplanted crop were fewer than those on other crops and in some cases no chemical control was used.

On the Lancashire crops the spraying programme consisted, almost without exception, of the two chemicals CIPC (chlorpropham) and Gramoxone (paraquat), used either alone or more commonly in conjunction with one another. The stale seed bed technique, whereby the seed bed is prepared a few weeks in advance and then the germinated weed seedlings are sprayed off with paraquat at a usual rate of 4.2 litres/hectare prior to sowing or planting, was used on about a quarter of the Lancashire crops. On eighty per cent of the crops, the residual weed killer CIPC, was normally applied at 4.2 litres/hectare either a few days before planting or straight after sowing; in many cases, i.e. sixty per cent of the crops, this was followed by one inter-row application of paraquat and occasionally two, at a usual rate of 5.6 litres/hectare.

The farms which were costed in the Norfolk area tended to favour mechanical control of weeds rather than chemical, and inter-row cultivations were commonly used as well as hand hoeing.

On the farms costed in the southern parts of the country, the residual weedkillers Kerb (propyzamide) and J.M.S.6 (sulphallate/chlorpropham) were used. Kerb was normally applied at the rate of 2.2 Kg/hectare and in almost all cases no other weedkiller was applied; J.M.S.6 was applied at 5.6 litres/hectare prior to planting or sowing and was sometimes followed by an application of Kerb at about 1.2 Kg/hectare.

The following table shows the average cost of chemical weedkillers per hectare for the four types of crop.

TABLE 15: Average costs of chemical weedkiller per hectare

	1975	1976	1977
	£	£	£
Transplanted (A)	9.27	11.10	12.70
Sown and thinned (B <sub>1</sub> )	14.76	17.70	20.20
Precision drilled (B <sub>2</sub> )	18.61	22.30	25.40
Overwintered (C)	21.73	26.10	29.80

Within these groups there were variations from one area to another. This was particularly so in the transplanted crop, where on the two farms in the east no chemical control was used and on the seven farms in the Southport area the average cost of herbicides was only £2 per hectare in 1975, whereas the cost in the Manchester and Middlesex areas was about £11, and £25 in Kent.

Chemical control of weeds was not thorough enough to eliminate hand hoeing and the majority of the crops costed were hoed to varying degrees, usually by casual labour.

(b) Pesticides

Almost all of the crops were sprayed, at least once, and more often two or three times against aphids, depending on the severity of the problem. The most widely used pesticide was Metasystox with which 44 of the 62 crops costed were sprayed with, at a usual rate of 0.4 litres/hectare, 15 of these crops being sprayed twice, and 4 three times. In addition or instead of Metasystox other chemicals used for the control of aphids included Rogor (dimethoate), Ekatin (thiometon), Malathion, Aphox (pirimicarb), and Phosdrin (mevinphos). In all 31 per cent of the crops were sprayed once against aphids, 35 per cent twice, 23 per cent three times, 8 per cent four times and 3 per cent not at all. D.D.T. was used against caterpillars and cutworm on ten of the crops and occasionally, where lettuce root aphid was a problem, diazinon was sprayed onto the soil prior to planting or sowing, and rotovated in.

The average cost of pesticides did not vary a great deal from one group to the next, although the amount spent on the transplanted crop was the lowest of the four.

TABLE 16: Average costs of pesticides per hectare

	1975	1976	1977
	£	£	£
Transplanted (A)	7.90	9.50	10.80
Sown and thinned (B <sub>1</sub> )	13.95	16.70	19.00
Precision drilled (B <sub>2</sub> )	10.15	12.20	13.90
Overwintered (C)	12.27	14.70	16.80

(c) Fungicides

Half of the crops costed were treated with fungicides to varying extents, the overwintered crops incurred the largest expense, all the crops in this group being sprayed at least once. The most common chemicals used were Benlate (benomyl) at 1.1 Kg/hectare, Dithane (zineb) at 2.2 Kg/hectare and Trimangol (maneb) at 1.7 Kg/hectare.

TABLE 17: Average costs of fungicides per hectare

	1975	1976	1977
	£	£	£
Transplanted (A)	7.42	8.90	10.10
Sown and thinned (B <sub>1</sub> )	2.98	3.60	4.10
Precision drilled (B <sub>2</sub> )	5.22	6.30	7.20
Overwintered (C)	16.73	20.10	22.91

It was particularly noticeable that both the transplanted and precision drilled crops in the Manchester area incurred very small fungicide costs;

indeed only 2 of the 8 transplanted crops and 2 of the 9 precision drilled crops were sprayed with a fungicide.

4. Miscellaneous Variable Costs

The transplanted crop incurred plant propagation costs, including heating costs, peat and compost, sterilizer and others such as trays. These costs varied a great deal from one farm to another but on average, during the costing year, they amounted to £84.61 per hectare. With an average plant population of 101 thousand plants per hectare this gave a cost of 84p per thousand plants, in addition the seed costs amounted to £18.43 or 18p per thousand, and an average of 95 labour hours were spent raising each 101 thousand plants at a cost of £95.00 or 94p per thousand.

TABLE 18: Propogating costs

	Costs per thousand plants (£)		
	1975	1976	1977
Seed	0.18	0.22	0.28
Miscellaneous	0.84	1.00	1.20
Labour	0.94	1.19	1.28
Total	1.96	2.41	2.76

Contract work was relied on in only a few cases and this was usually for ploughing or spraying. As mentioned before farm yard manure, which was usually purchased, and lime were applied as required.

Fixed Costs

A record of the labour and tractor hours spent on each crop was recorded and the results are summarized in Tables 19 and 20.

From the first table it can be seen that the transplanted crop incurred the highest demand for labour as a result of the plant raising and planting

TABLE 19: Labour Hours (Per Hectare)

	Cultivations	Plant Raising	Planting/ Sowing	Spray	Weeding/ Thinning	Steerage Hoeing	Miscellaneous	Harvest/ Packing	TOTAL
<u>Transplanted (A)</u>									
Southport	11	80	215	3	131	-	1	178	619
Manchester	17	57	144	11	185	-	3	203	620
South and East	11	146	177	7	14	8	-	278	641
All	13	95	177	7	109	2	1	221	625
<u>Sown and Thinned (B<sub>1</sub>)</u>									
South and East	9	-	6	7	78	9	-	243	352
<u>Precision Drilled (B<sub>2</sub>)</u>									
Southport	10	-	4	7	125	-	1	136	283
Manchester	14	-	5	12	94	-	-	139	264
South and East	9	-	3	3	110	5	10	191	331
All	11	-	4	7	109	2	4	159	296
<u>Overwintered (C)</u>									
South and East	8	-	4	6	176	9	-	195	398

TABLE 20: Tractor Hours (Per Hectare)

	Cultivation	Planting/Sowing	Spray	Steerage Hoeing	Miscellaneous	Harvest	TOTAL
<u>Transplanted (A)</u>							
Southport	11	22	3	-	-	15	51
Manchester	17	43	11	-	-	25	96
South and East	11	26	7	6	-	17	67
All	13	31	7	2	-	19	72
<u>Sown and Thinned (B<sub>1</sub>)</u>							
South and East	9	6	2	8	-	9	34
<u>Precision Drilled (B<sub>2</sub>)</u>							
Southport	10	4	7	-	-	19	40
Manchester	14	5	12	-	-	26	57
South and East	9	3	3	4	1	23	43
All	11	4	7	2	-	23	47
<u>Overwintered (C)</u>							
South and East	8	4	6	9	-	21	48



operations, which together amounted to 272 hours per hectare for all the crops in the sample. The highest labour input common to all crops was for the harvesting and packing operations which averaged nearly 200 hours; this was followed by hand weeding and thinning which amounted to 115 hours, with the exception of the transplanted crops in the South and East where the emphasis was on mechanical hoeing.

Because of the labour intensive nature of most of the operations, tractor hours per hectare were considerably less than labour hours. The average for the transplanted crop being 72 hours per hectare and for all other crops 45.

The rates per hour for labour and tractor costs are included in Appendix II. A standard value of 60 per cent has been added to the tractor costs to cover other machinery expenses i.e. maintenance, repairs and depreciation on cultivation equipment, drills, planters, sprayers etc.

In order to calculate the net margin, rent and rates (£40.40 per hectare), and a figure for repairs and maintenance (£12.50 per hectare) have been deducted as well as a share of the general farm overheads (£11.00 per hectare), which includes items such as telephone, general insurances and professional fees. These three standard figures were obtained from the Manchester University Farm Management Survey and relate to farms in the intensive arable category for the 1975 crop year.

#### Marketing and Packaging Costs

Despite the fact that all sales were recorded net of marketing and packaging costs, it should be remembered that these are major costs of lettuce production.

Packaging costs during the 1975 costing year varied between 10 pence and 20 pence per dozen depending on the type of lettuce, in general the cos type lettuce incurred the higher cost. Transport costs varied between 5 pence and 14 pence per dozen depending on the distance to the market. Most growers tended to grow for the local market only i.e. the Lancashire crops generally going to

Manchester or Liverpool and the southern and eastern crops going to London and the South East; nevertheless a sizeable proportion of the Manchester crop was sent to London, and some of the larger growers had a national distribution. The majority (54 per cent) of growers sold most of their crop through the wholesale markets where it was subject to a commission charge of 10 per cent, a smaller percentage (24 per cent) sold direct to a retail outlet, and 16 per cent sold through a produce merchant. This bears out an observation made in the previous Manchester report, that supermarkets and chain stores can provide a good market outlet for the larger grower or growers organizations, who can supply substantial quantities of reliable quality produce.

The importance of marketing costs in lettuce growing can be seen in the following tables, (all gross prices are taken from the weekly prices as reported by the Government Statistical Service in the Agricultural Market Report). In Table 21 the gross price taken per dozen is based on the weekly prices of all types of outdoor lettuce sold throughout the year, and shows the general trend of prices over the last three years. In Table 22 the price is based on cos and crisp type lettuce sold during the early season, i.e. from the end of May to the end of July, the net price being £0.78 in 1975; this was very similar to the price received by the growers of this type of lettuce in the Manchester and Southport areas for the transplanted crop in the same year (Table 25). Table 23 shows the price received for lettuce sold during the main season i.e. that which is cut from the end of July to the end of September, for cos and crisp type only; the net price being £0.71 in 1975, which was similar to the price received by growers in Lancashire for the drilled crop. The prices for cabbage lettuce sold during the main season, which are shown in Table 24, are in general lower than the prices achieved for cos and crisp lettuce, the cabbage type nevertheless incurring the lower packaging costs. The net value of the cabbage lettuce compares with the price received by growers in the South and Eastern areas of the country in the survey for the precision drilled crop which was mainly of this type.

TABLE 21: Average Yearly Prices (All Types)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Average gross price per dozen	0.95	1.02	0.87
Deductions: commission	0.10	0.10	0.09
packaging	0.15	0.17	0.19
haulage	<u>0.07</u>	<u>0.08</u>	<u>0.10</u>
	0.32	0.35	0.38
Net price to grower	0.63	0.67	0.49

TABLE 22: Average Prices for Early Season (cos and crisp only)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Average gross price per dozen	1.14	1.10	1.06
Deductions: commission	0.11	0.11	0.11
packaging	0.18	0.20	0.23
haulage	<u>0.07</u>	<u>0.08</u>	<u>0.10</u>
	0.36	0.39	0.44
Net price to grower	0.78	0.71	0.62

TABLE 23: Average Prices for Main Season (cos and crisp only)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Average gross price per dozen	1.07	1.27	0.76
Deductions: commission	0.11	0.13	0.08
packaging	0.18	0.20	0.23
haulage	<u>0.07</u>	<u>0.08</u>	<u>0.10</u>
	0.36	0.41	0.41
Net price to grower	0.71	0.86	0.35

TABLE 24: Average Prices for Main Season (cabbage only)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Average gross price per dozen	0.94	1.04	0.64
Deductions: commission	0.09	0.10	0.06
packaging	0.12	0.14	0.16
haulage	<u>0.07</u>	<u>0.08</u>	<u>0.10</u>
	0.28	0.32	0.32
Net price to grower	0.66	0.72	0.32

Yields and Returns

TABLE 25: Average yields, values (net of marketing and packaging costs), and net prices per dozen. (All figures relate to the 1975 crop)

	Yield (dozen/hectare)	Value (£/hectare)	Price per Dozen (£)
<u>Transplanted crop</u>			
Southport	4490	3457	0.77
Manchester	4005	3084	0.77
South and East	4305	3573	0.83
Average of all areas	4263	3368	0.79
Average of top 25 per cent	6019	5056	0.84
Average of bottom 25 per cent	2645	1613	0.61
<u>Sown and thinned crop*</u>			
South and East	2940	2165	0.74
<u>Precision drilled crop</u>			
Southport	2566	1873	0.73
Manchester	2993	2184	0.73
South and East	2536	1630	0.64
Average of all areas	2719	1876	0.69
Average of top 25 per cent	3877	2559	0.66
Average of bottom 25 per cent	1634	899	0.55
<u>Overwintered crop*</u>			
South and East	2853	2274	0.80

\* Because of the small numbers of farms in these two groups it was not possible to calculate averages for the top or bottom 25 per cent farms for yield or value.

The transplanted crop yielded far heavier than other crops during the costing year. The average yield was nearly 4300 dozen lettuce per hectare and this represented 51 per cent of the potential yield with an average plant population of 101 thousand plants per hectare. Variations in numbers of lettuce sold per hectare were very wide from farm to farm, and the range was from 1481 dozen

per hectare to 7288. Being earlier than the two drilled crops the average price received was higher at 79 pence per dozen, and the average value of the crop was £3368 per hectare, although again this did vary from £918 to £5837 on individual farms.

The following table shows the amount of lettuce which was sold in each month. Figures are percentages of the total amount of lettuce sold during the year for each type of crop, and relate to eighteen farms for which this data was available. Specific records for the overwintered crop were not recorded but in general most of the crop was cut in May and June.

TABLE 26: Percentage monthly distribution of sales for the transplanted and spring and summer drilled crops

	Transplanted crop	Sown and thinned	Precision drilled
April	-	-	-
May	6	-	-
June	53	4	8
July	29	26	32
August	9	28	35
September	2	23	18
October	1	17	6
November	-	2	1
TOTAL	100%	100%	100%

The early overwintered crop fetched the highest average price per dozen i.e. 80 pence, but with a lower average yield than the transplanted crop, the value was about £1000 less per hectare. With a plant population of approximately 90 thousand plants per hectare the average yield of 2853 dozen represented 38 per cent of the potential.

Dry weather during the summer of 1975 depressed the yields of the spring and summer drilled crops. The relatively few crops of the sown and thinned type

had a slightly heavier yield (2940 dozen per hectare) than the precision drilled crop (2719 dozen) and coupled with a slightly higher price the average value of the crop was £300 more. Both crops were cut at roughly the same time (Table 26), although the precision drilled crop tended to tail off more quickly at the end of the season. Due to the small numbers of crops the variation in yields and returns from one farm to another in the sown and thinned category were not so marked as those of the precision drilled crop, and, with the latter type, yield varied from 772 dozen per hectare to 4241, and value from £587 to £3006. Average plant populations for both crops were the same as those for the transplanted crop, i.e. 101 thousand per hectare, and lettuce sold represented 35 per cent of potential for the sown and thinned group and 32 per cent for the precision drilled group.

#### Updated Costs and Returns

Tables 27 and 28 show updated margins for the main crop types, i.e. the transplanted crop and the precision drilled crop, for the two years since the original costing was carried out. Two yield figures have been used for each year, the first figure being the average yield for each group during 1975, i.e. 4263 dozen per hectare for the transplanted crop and 2719 for the precision drilled crop. The second yield figure has been adjusted because of the differing yield conditions in 1976 and 1977 compared with the survey year of 1975. The 1976 yield, in a drier year than 1975, has been estimated at 10 per cent below the 1975 level, and the 1977 yield set at 30 per cent above the 1975 level owing to the good growing conditions in that year. A higher figure would have been justifiable had there not been a high degree of wastage in 1977 when supply was exceeding demand. Prices applied to the yields have been taken from Tables 22, 23 and 24; the net price per dozen for the transplanted crop being the price received for the early season cos and crisp type lettuce (71 pence in 1976 and 62 pence in 1977) because of most of the area of the transplanted crop being of this type, and the net price for the precision drilled lettuce being an average

TABLE 27: Updated Margins (1976) £ per Hectare

	Transplanted Crop	Precision Drilled Crop
<b>Variable Costs:</b>		
Seed	22.10	31.10
Fertilizer	78.10	73.60
Herbicide	11.10	22.30
Pesticide	9.50	12.20
Fungicide	8.90	6.30
Heating	17.50	-
Peat and Compost	61.80	-
Sterilization	3.10	-
Contract	1.90	4.50
F.Y.M. and Lime	13.20	11.10
Other	19.10	2.40
<b>Total</b>	<b>246.30</b>	<b>163.50</b>
<b>Fixed Costs:</b>		
Labour	787.50	373.00
Tractor and Machinery	145.20	94.80
Rent and Land Expenses	60.80	60.80
General Overheads	18.30	18.30
<b>Total</b>	<b>1011.80</b>	<b>546.90</b>
<b>Return, Net of Marketing and Packaging:</b>		
A. Same yield as 1975	3027.00 (4263 doz/ha)	2148.00 (2719 doz/ha)
B. 10% less than 1975 yield	2726.00 (3840 doz/ha)	1936.00 (2450 doz/ha)
<b>Gross Margin:</b>		
A.	2780.70	1984.50
B.	2479.70	1772.50
<b>Net Margin:</b>		
A.	1768.90 (£716.15/ac)	1437.60 (£582.02/ac)
B.	1467.90 (£594.29/ac)	1225.60 (£496.19/ac)

TABLE 28: Updated Margins (1977) £ per Hectare

	Transplanted Crop	Precision Drilled Crop
<b>Variable Costs:</b>		
Seed	30.40	42.70
Fertilizer	88.30	83.20
Herbicide	12.70	25.40
Pesticide	10.80	13.90
Fungicide	10.10	7.20
Heating	21.10	-
Peat and Compost	74.10	-
Sterilization	3.70	-
Contract	2.30	5.40
F.Y.M. and Lime	15.80	13.40
Other	22.90	2.90
<b>Total</b>	<b>292.20</b>	<b>194.10</b>
<b>Fixed Costs:</b>		
Labour	850.00	402.60
Tractor and Machinery	173.00	113.00
Rent and Land Expenses	70.00	70.00
General Overheads	21.00	21.00
<b>Total</b>	<b>1114.00</b>	<b>606.60</b>
<b>Return, Net of Marketing and Packaging:</b>		
A. Same yield as 1975	2643.00 (4263 doz/ha)	897.00 (2719 doz/ha)
B. 30% more than 1975 yield	3435.00 (5540 doz/ha)	1167.00 (3535 doz/ha)
<b>Gross Margin:</b>		
A.	2350.80	702.90
B.	3142.80	972.90
<b>Net Margin:</b>		
A.	1236.80 (£500.73/ac)	96.30 (£38.99/acre)
B.	2028.80 (£821.38/ac)	366.30 (£148.30/acre)



of the main season cabbage type and the main season cos and crisp type (79 pence in 1976 and 33 pence in 1977).

The poor margins made from the precision drilled lettuce crop, which represents the bulk of the area of lettuce grown in the country in 1977 are illustrated in Table 28. In comparison with 1975 the updated margins based on the adjusted yield figures for 1976 and 1977 were down 6 per cent and 72 per cent respectively for the precision drilled crop, and if the differences were measured in real terms the net margins would be lower still. The early transplanted crop which is grown on a significantly smaller scale than the precision drilled crop showed a drop in net margin of 38 per cent in 1976 compared with 1975 due to the lower prices early in the year. However due to the increased yield in 1977 the margin increased, but was still 14 per cent lower than in 1975, prior to prices plummeting in the summer.

#### Costs of growing for 1978

The costs of growing two typical crops of Lancashire lettuce are outlined below in Table 29. Standard seed rates, fertilizer applications and spraying programmes, as well as labour and tractor rates have been taken from the findings of the survey, and current costs have been applied to these. Packaging costs which would add approximately another 19 pence per dozen for cabbage type lettuce and 27 pence for cos type have not been included and neither have any marketing costs. The growing costs have been divided by four yields, i.e. 5000, 4000, 3000 and 2500 dozen per hectare to give an indication of the growing costs per dozen lettuce harvested.

TABLE 29: Growing Costs for 1978

	£ per hectare	
	A	B
Seed: 12 Kg/Ha pelleted seed @ £5.75/Kg	69.00	
Plants: 100,000/ha @ £4.00/1000		400.00
Fertilizer: 800 Kg/Ha 17.8.24 @ £97.50 per tonne		78.00
Herbicide:		
(1) Gramoxone, 4.2 litres/ha @ £16.20/5 litres		13.60
(2) CIPC, 4.2 litres/ha @ £11.00/5 litres		9.20
(3) Gramoxone, 5.6 litres/ha		18.10
Pesticide: Metasystox, 420 ml/ha (2x) @ £14.60/litre		12.30
FYM and lime (costs shared over a number of years)		18.00
Total Variable Costs	<u>218.20</u>	<u>549.20</u>
Labour: A. 296 hours @ £1.45/hr.	429.00	
B. 530 hours		769.00
Tractor and machinery:		
A. 47 hours @ £1.80/hr.*	135.00	
B. 72 hours		207.00
Rent and land expenses		81.00
General Overheads		24.00
Total fixed costs	<u>669.00</u>	<u>1081.00</u>
Total Costs	<u>887.20</u>	<u>1630.20</u>
Cost of growing and cutting per dozen:		
(1) @ 5000 dozen/ha	0.18	0.33
(2) @ 4000 dozen/ha	0.22	0.41
(3) @ 3000 dozen/ha	0.30	0.54
(4) @ 2500 dozen/ha	0.35	0.65

\* Plus 60% for machinery costs.

CHAPTER V

CONCLUSIONS

Field lettuce is traditionally a small growers crop because of its highly labour intensive nature and according to figures derived from the June 1977 census the average area of lettuce grown on holdings with lettuce in England and Wales was 1.0 hectare, indicating that the sample of growers in this survey was not particularly representative of the average lettuce grower. Of the 4054 holdings growing lettuce in June 1977, slightly more than three quarters of these had less than one hectare (their average area being 0.3 hectares) and grew about one fifth of the total area. At the other extreme one third of the area was grown on holdings with over eight hectares of lettuce (the average area being 15.5 hectares), these holdings representing only two per cent of the total. In comparison with similar figures of eight years ago the number of growers with field lettuce in June has decreased by over two thousand, almost all of these being lost from those with under one hectare. Despite the fact that the total area of lettuce recorded in June has also decreased, it can be seen that the tendency is for the smaller growers to stop producing field lettuce and for their place to be taken by a few larger growers. The movement in this direction has been facilitated by the introduction of pelleted seed and precision drilling, the development of new herbicides, and the use of assisted hand harvesting techniques, all of which aim of reducing the amount of labour involved in growing the crop.

A constant source of worry to growers is the effect that an increase in the area of the crop grown will have on prices. Lettuce prices are very much at the mercy of the market and it is certain that when prices are high there is an insufficient supply meeting a heavy demand, and that when prices are low supply is exceeding demand, and that this is when the bulk of the crop is being marketed. The effects of over supply were all too evident in 1977 when large

amounts of the crop were ploughed back in because the price did not justify the cost involved in cutting and marketing, and it is estimated that one fifth of the field lettuce grown in Lancashire that year was not cut. As well as over supply resulting from an increase in the area of the crop grown, it could also result from new advances in the growing of the crop which can achieve a much higher yield, if not accompanied by a corresponding decrease in acreage. It has been shown that by propagating lettuce in compost blocks raised under glass and transplanting them into the field a much tighter control is possible on continuity of production, and that as many as three and possibly four crops can be grown on the same area of land. This system of growing is very labour intensive however, both in raising the plants and in transplanting into the field. There is also the problem of the establishment of the plants once they are transplanted, and on sandy soils irrigation is often necessary after planting, unlike the traditional transplanted crops grown on the Lancashire mosses. The fluid drilling of pre-germinated seeds is another way of increasing yields and its potential is considerable, however there are problems associated with drilling into dry soil and again irrigation is usually necessary.

There has been an increasing tendency for the larger grower to gear production to the needs of the market, either through a produce merchant prepacking vegetables for chain stores or supermarkets, or by dealing direct with a retail outlet. This outlet has prompted some growers to go for all year round production, growing glasshouse lettuce as well as outdoor. Conversely some winter glasshouse lettuce growers have now entered into all year round production under glass to meet demands from supermarkets for a uniform product, and by doing so have created competition with the outdoor crop for the summer market.

With the advent of new techniques in the growing of the outdoor crop and recent trends in its marketing, away from the traditional wholesale markets,

it seems that there is wide scope for cooperation amongst smaller growers both in production and marketing. If they continue to work independently producing in the traditional way for traditional markets they will inevitably face fierce competition from the larger growers using new methods of production and of marketing, and it is likely that their numbers will continue to dwindle. They therefore need to think seriously about combining together to supply a newer and wider market in order to ensure their own future.

APPENDIX I

AVERAGE WHOLESALE MARKET PRICES PER DOZEN OPEN GROWN LETTUCE 1975-1977

	Cabbage	<u>1975</u>		Cabbage	<u>1976</u>	
		Crisp	Cos		Crisp	Cos
May	0.98	-	1.28	0.81	-	0.94
June	1.20	1.35	1.28	0.65	0.92	0.91
July	0.84	0.96	0.99	1.11	1.34	1.35
August	1.08	1.13	1.20	1.35	1.51	1.51
September	0.90	1.13	1.09	0.89	1.02	1.17
October	0.59	0.73	0.73	0.61	0.76	0.83
November	0.47	0.69	0.78	0.65	0.73	0.93

	Cabbage	<u>1977 (Class I only)</u>	
		Crisp	Cos
May	1.50	-	1.59
June	0.91	1.20	1.28
July	0.63	0.75	0.76
August	0.58	0.71	0.72
September	0.73	0.84	0.82
October	0.84	0.95	0.96
November	0.75	0.95	-

Source: Government Statistical Service, Agricultural Market Report.

APPENDIX II

(a) LABOUR AND TRACTOR RATES PER HOUR

	<u>Labour (£)</u>	<u>Tractor (£)</u>
1975	1.00	0.93
1976	1.26	1.26
1977	1.36	1.50

(b) INDICES FOR UPDATING 1975 COSTS  
(1975 = 100)

	<u>1976</u>	<u>1977</u>
Seed(average of all types)	120	165
Fertilizer	106	120
Sprays	120	137
Other variables	120	144

(c) RENT AND LAND EXPENSES AND GENERAL OVERHEADS  
(£ per hectare)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Rent and land expenses	52.90	60.80	70.00
General overheads	11.00	18.30	21.00

1975 and 1976 costs were taken from the intensive arable group in the Manchester University Farm Management Survey sample, the 1977 costs were updated by adding 15 per cent to the 1976 figure.

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