Onions

UNIVERSITY OF NOTTINGHAM

Department of Agriculture and Horticulture

DRY BULB ONIONS

H. W. T. Kerr
and
C. H. Tilston

Agricultural Enterprise Studies in England and Wales, Economic Report No. 70

JANUARY 1980

UNIVERSITY OF NOTTINGHAM

DEPARTMENT OF AGRICULTURE AND HORTICULTURE

DRY BULB ONIONS

A study of the 1977 crop

H. W. T. Kerr

and

C. H. Tilston

Price £2.00

January 1980

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.

CONTENTS

FOREWORD

This study was carried out in conjunction with the University of Cambridge and was co-ordinated by the University of Nottingham. The report is divided into three main sections. The first, "The Market for Onions in the UK", has been written by Mr. C.H. Tilston and the second, "The Production Economics of the 1977 Crop", by Mr. H.W.T. Kerr. The final section "Conclusions" is the work of both authors.

The authors are, as usual, greatly indepbted to all those growers who so kindly co-operated in this study and others who assisted with it particularly Mr. George le May of ADAS. Mr. Bill Brooks undertook the field work at Cambridge and Mr. Bob Goodrum at Nottingham; Mrs. Mavis Smith was responsible for the analysis of the data, and Mrs. Phyllis Yates typed the report and its several drafts.

H. W. T. Kerr

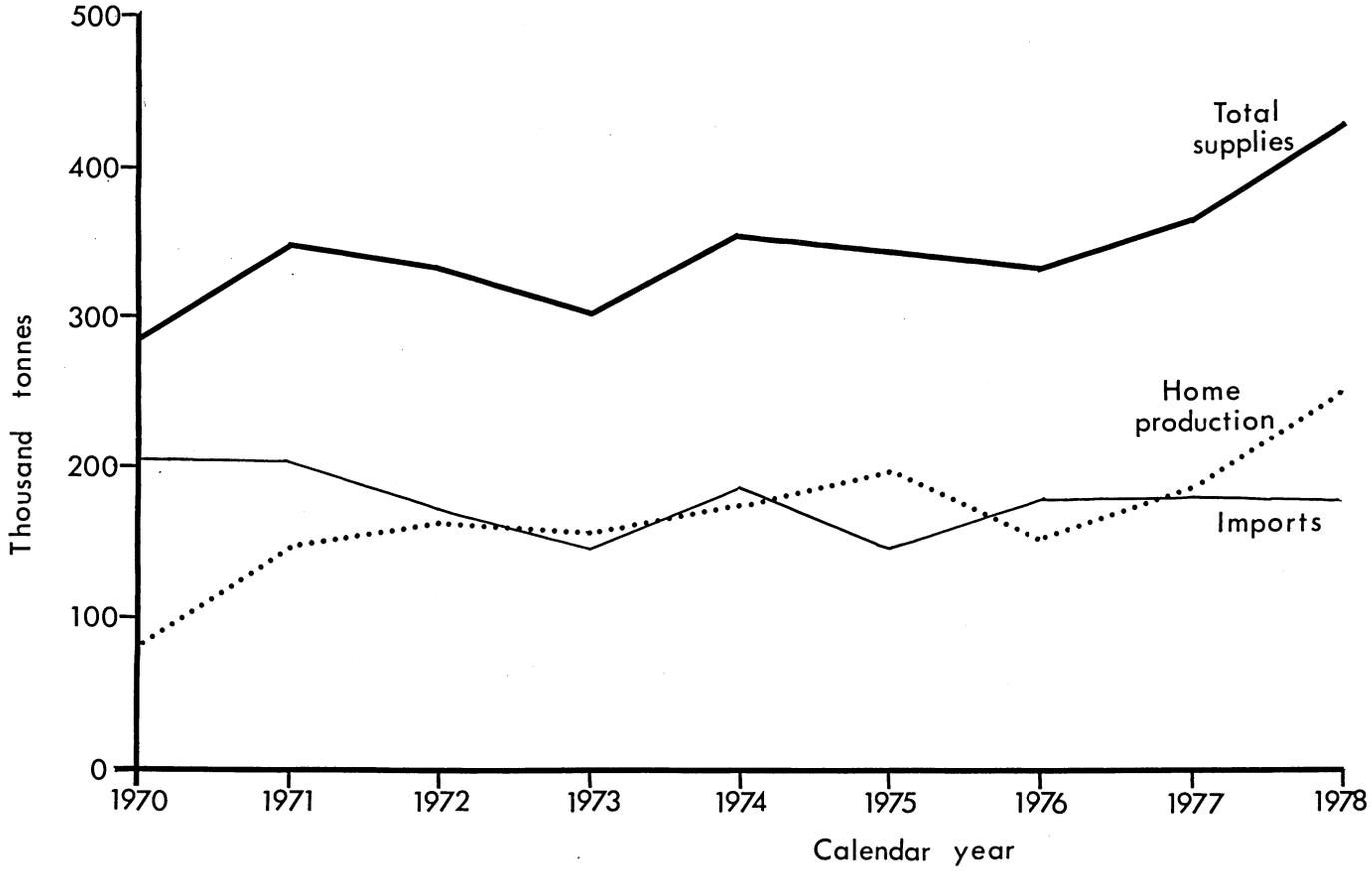
Section 1 THE MARKET FOR ONIONS IN THE UK.

1. Supply of Onions in the U.K.

1.1 Total Supplies of Dry Bulb Onions

Dry bulb onions coming on the U.K. market are supplied from both domestic production and imports. Total supplies vary annually and this reflects fluctuations in both domestic production and imports (Fig. 1).

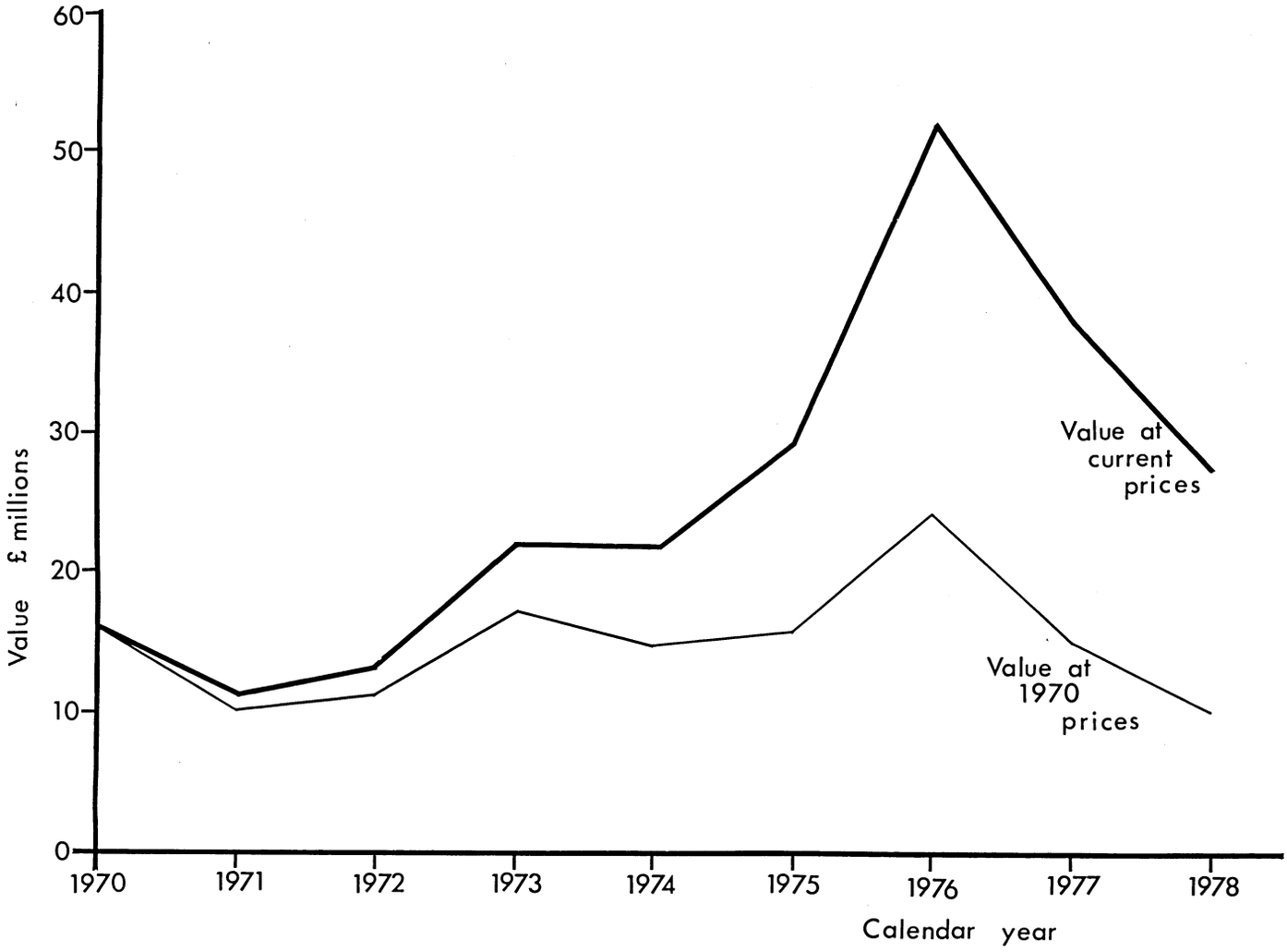
Fig. 1 TOTAL U.K. SUPPLIES OF DRY BULB ONIONS



Between 1970 and 1978 average total supplies were 343,922 tonnes per annum, ranging from 285,800 tonnes in 1970 to a peak of 429,300 tonnes in 1978. The United Kingdom has become more self sufficient during the 1970's than previous decades and in 1978 produced more than half of total supplies.

The value of supplies has also shown marked variations reflecting both differences in quality and quantity of domestic production and imported supplies. The total value of supplies has increased from £16.1 million in 1970 to £27.9 million in 1978 at current prices (Fig. 2). At 1970 prices however the value of the crop in 1978 was £10.3 million.

Fig. 2 VALUE OF TOTAL SUPPLY OF DRY BULB ONIONS AT CURRENT AND 1970 PRICES



1.2 Imports

Imports come from many sources but the three major suppliers are Chile, Spain and the Netherlands. Other suppliers of importance include Israel, Canada, Malta, Poland, Egypt and the United States. Together with Chile, Spain and the Netherlands these countries supply over 90% of import requirements.

Imports from individual countries are of a seasonally sequential nature. The bulk of Spanish onions are imported between June and February, the main marketings of Netherland onions occur between August and April. Egyptian and Chilean supplies are concentrated in the late spring and early summer period. In total, however, imports complement domestic production and are lowest in September and October when the bulk of English onions are harvested.

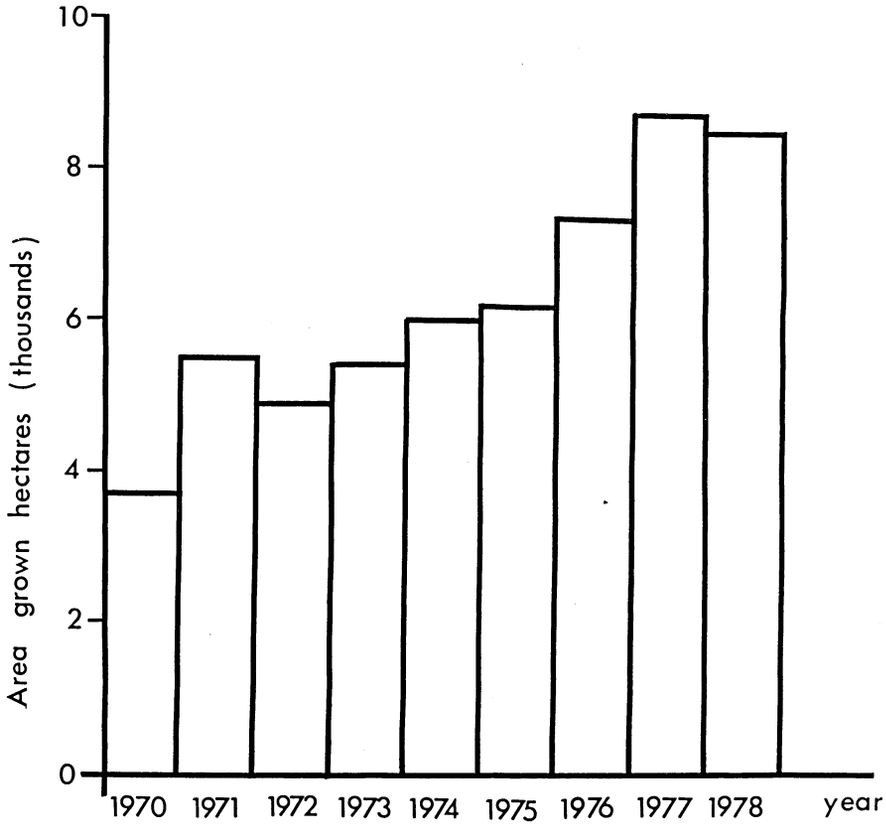
1.3 Exports

A small but expanding export market is developing. In 1978, 2973 tonnes valued at £425,000 were exported from the U.K. to West Germany, France and the Netherlands.

1.4 Home Production

The area of dry bulb onions grown in England and Wales rose dramatically between 1961 and 1971 from 845 hectares to 5473 hectares. The area has continued to increase steadily since 1970, the last year in which a study was carried out[1] (Fig. 3).

Fig. 3 AREA OF DRY BULB ONIONS GROWN IN THE U.K.



Most of the crop is grown in the Eastern and East Midland regions. In the East Midlands nearly all the crop is grown in Lincolnshire, and in the Eastern Region in Cambridgeshire and Norfolk (Table 1).

---

(1) Kerr, H.W.T. Dry Bulb Onions. Agricultural Enterprise Studies in England and Wales, Economic Report No. 25, University of Nottingham, Dept. of Agriculture and Horticulture, Nov. 1973.

Table 1 Geographical Distribution of Dry Bulb Onions

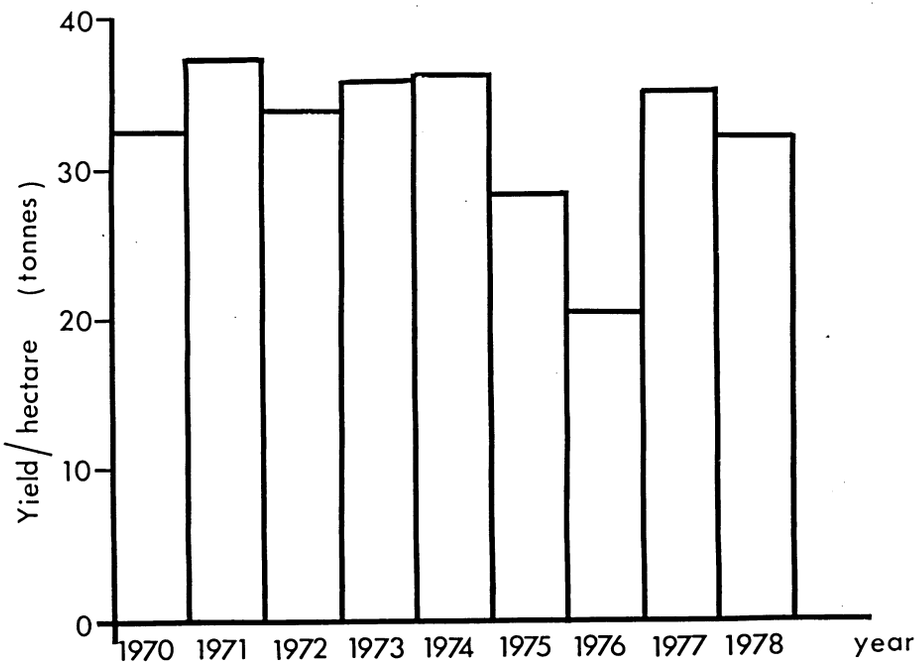
hectares

	1971	1974	1977
England and Wales	5473	6081	8635
East Midland Region	2098	2349	3268
Eastern Region	2783	3066	4166
Total East Midland and Eastern Regions	4881	5415	7434
East Midland Region Counties			
Lincolnshire	2013	2274	3129
Derbyshire	2	2	37
Leicestershire	21	1	11
Northamptonshire	38	42	35
Nottinghamshire	24	30	56
Eastern Region Counties			
Bedfordshire	101	102	102
Cambridgeshire	1422	1574	2299
Essex	164	140	187
Greater London	10	6	4
Hertfordshire	8	5	5
Norfolk	899	999	1266
Suffolk	179	240	303

Source: MAFF June 4th Returns

Yields fluctuate annually due primarily to climatic conditions. The average yield between 1970 and 1978 was 31.98 tonnes per hectare with a trough of 20.51 tonnes per hectare in 1976 resulting from the drought conditions in that year and a peak of 37.07 tonnes per hectare in 1971 (Fig. 4).

Fig. 4 ESTIMATED YIELD OF DRY BULB ONIONS GROWN IN THE U.K.



The proportion of gross production actually marketed is a function of conditions at harvest time. Inadequate storage and drying facilities have resulted in the past in considerable wastage following a poor harvest period and have had a detrimental effect on crop quality and the subsequent price received by farmers. In recent years research and development work has done much to enhance the quality of the crop.

The price which domestic producers receive is dependent on three major factors, the overall supply and demand situation, the quality of the crop and the marketing period. Prior to the early 1970's the major proportion of the supply of dry bulb onions was imported. The prices which domestic producers received was therefore more dependent on the quality of the crop in relation to imports than on the quantity produced. In recent years, however, the increasing degree of self sufficiency has meant that both the quality and the quantity of home produced onions are important factors in determining prices. The demand for onions is relatively price inelastic and hence fluctuations in total supplies result in volatile price movements. The volatility is dampened to some extent by the compensatory role which imports play. In years of low home production the balance of requirements can, in theory, be met by increased imports. In practice reductions in domestic production may coincide with shortages in international trade and prices escalate.

It is not possible from statistics calculated on an annual basis to analyse market conditions since the crop year does not coincide with the calendar year. The statistics calculated on a crop year (Appendix Table 3) provide a clearer insight of the factors operating in the market.

The area grown in 1971 had not been attained previously but with a good yield per hectare and substantial imports the price received was poor and as shown in the previous report[2] a loss was made on average by the growers. In 1972 the total area was reduced, the yield per hectare was lower, the volume of imports declined and as a result the price to growers almost trebled. In 1973 the area grown increased, yield increased, imports fell and prices on average increased slightly. In 1974 the area increased, yield increased marginally, imports increased but prices held.

---

(2) Kerr, H.W.T. op. cit.

In 1975 although the area grown increased the yield fell due to dry conditions and this shortfall was not compensated by imports and prices escalated. In 1976 the area grown again increased but a second dry season drastically reduced yields and despite some compensatory increase in imports, prices rose further. In 1977 the year of the study the area grown again increased substantially but the yield per hectare returned to normal and the price fell to the level of 1972. As a result 1977 was not a good year for onion growers.

Within the overall supply and demand situation the prices which growers receive are dependent upon the quality of the crop. There is a clear differential in favour of imported onions although this differential narrows in periods of short supply. Since 1st February 1974 the home grown crop has been subject to EEC grading standards for onions. Onions must be graded into one of three classes. Whilst Class I and Class II onions are similar in quality to imported supplies there is usually a price differential in favour of imported onions. Moreover there are significant price differentials between Class I, II and III. The average price the producer receives therefore is related to the proportion of the crop within each grade and the price differentials between grades. Whilst conditions at harvest influence the overall quality of the crop a movement towards a higher proportion of onions in Class I is dependent upon the use of efficient curing and storage practices.

The comparison between the annual differential for imported and home produced supplies conceals to some extent the marketing opportunities available to the producer to increase his returns by orientating his selling arrangements towards the seasonal high priced periods. Prices generally follow a seasonal cycle being low in October, rising until May and gradually falling again. The producer can enter the higher priced marketing season by two methods. Firstly by growing autumn-sown crops and marketing before the main spring-sown harvest. Secondly the producer could invest in modern controlled storage facilities and extend the marketing season to April, May and June. Over the years since 1971 greater attention to quality production together with the commercial acceptance of the technique of growing autumn-sown onions for out of season production has led to a greater uptake by the market of the home grown product.

A further potential improvement in marketing arrangements is for producers to sell their crop through a marketing group. Of the 54 farmers surveyed in this study 13 belonged to a specialised marketing group. The primary aim of a production marketing organisation is to improve the long term income of their members. The successful implementation of this objective requires that the group identify buyers requirements and orientate their production and marketing methods to fulfilling these requirements for a greater return than alternative marketing channels. In order to maintain volume, consistency and quality a high degree of member discipline and an efficient market orientated management is of paramount importance. The potential benefits of greater returns resulting from collective action in identifying and satisfying buyers requirements must outweigh the increased costs if the group is to remain viable. The increasing market power of the supermarkets and multiple chain stores seeking contractual supplies outside the traditional wholesale chain must in future lead to a greater demand for direct purchases from growers. The power to negotiate with large scale buyers however is greater if the growers collectively seek to increase their bargaining strength.

2. Outlets for the Product

The onion crop has many uses. A 1970 report[3] estimated that 70% of the supply was destined for household consumption, 13% for catering, 7% for manufacturing purposes and 10% for pickling.

2.1 Household Consumption

The official statistics of food consumption in Great Britain are published in the National Food Survey. In the case of onions the data includes fresh green onions and leeks as well as dry bulb onions. However, the supplies of fresh green onions and leeks are a small proportion of the total, and, although it is therefore impossible to accurately analyse the trends in consumption and expenditure of dry bulb onions, a rough assessment can be made.

Between 1972 and 1977 average purchases of dry bulb onions, shallots and leeks was 2.88 ounces per person per week with small variations between years (Table 2).

---

(3) Agricultural Development Unit. Conrad Jameson Associates Ltd., Report on the Investigation into the Market for Onions in the U.K. 1970

Table 2 Household Consumption and Expenditure on Dry Bulb Onions, Shallots and Leeks

YEAR	Consumption oz/person/week	Expenditure at current prices pence/person/week	Retail Price Index 1970 = 100	Expenditure at Constant 1970 Prices pence/person/week
	oz	p		p
1972	3.01	0.97	117.0	0.83
1973	2.82	1.31	128.0	1.02
1974	3.02	1.43	148.5	0.96
1975	2.92	1.64	184.5	0.89
1976	2.82	2.13	215.0	0.99
1977	2.68	2.27	249.0	0.91

Source: National Food Survey Committee. Report on Household Food Consumption and Expenditure

Expenditure rose steadily during the period from 0.97p per person per week in 1972 to 2.27p per person per week in 1977. The rise in expenditure however is a reflection of rising prices rather than a marked increase in consumption and deflating the expenditure figures by the retail price index (1970 = 100) emphasise this (Table 2).

A relatively static demand in the face of larger price changes is indicative of a price inelastic demand and this is confirmed by the National Food Survey estimate of price elasticity at (-) 0.46. Furthermore the income elasticity of expenditure was estimated at 0.18 and the income elasticity on quantity purchased at 0.14. This shows that as incomes rise consumers purchase marginally more but to some extent transfer their expenditure to the higher quality grades.

Within any one year there are seasonal patterns of consumption and expenditure. The consumption of dry bulb onions is greater during the winter months when the housewife is preparing more dishes which incorporate onions. The seasonal expenditure however is generally higher in the summer months. This is a reflection of reduced home supplies and hence a greater reliance on more expensive imported supplies.

There are also marked regional differences in consumption, demand being highest in the North, North West and Yorkshire/Humberside regions and lowest in Wales, the South West, the South East and East Anglia.

2.2 Catering Demand

The catering trade generally uses unprepared bulb onions. The main users are office and factory canteens particularly in the North of England and Scotland. Hotels and resturants also prefer fresh unprepared onions. The catering trade, however, is making increasing use of ready-prepared onions which are first peeled and sold to the trade whole, sliced or diced. Thin skinned varieties which are easy to peel are required for this purpose. Institutions such as private schools, nursery establishments and industrial canteens which have a predictable demand are showing a preference for dehydrated onions although they are more costly to purchase and prepare. All dehydrated onions are imported into the United Kingdom since there are no dehydration plants here to handle imported or home grown onions.

2.3 Pickling Demand

Prior to 1972 most of the onions used for pickling and for inclusion in pickles and other sauces were imported. Until 1972 all silver skin or cocktail onions were imported provisionally preserved in brine. Despite considerable research and development into problems of harvesting, peeling and skinning the replacement of silver-skin imports by domestic supplies has not progressed to any appreciable extent.

Domestic production of pickles includes onions graded out of the ware crop and specially grown pickling onions. Pickles graded out of the ware crop are not considered satisfactory because they tend to be the wrong shape. The bulk of domestic production destined for pickling is confined to growers specialised pickling varieties on contract to processors.

2.4 Manufacturers Demand

Unprepared onions are also used in soup manufacture. Manufacturers prefer a round, pale, creamy white onion which must not be marked, skinned, bruised, diseased or show any green parts. Flavour is important but requirements vary from buyer to buyer. Size requirements also vary and both fresh and kibbled onions are used. Dehydrated onions and onion powder are used in the preparation of packet soups.

Onions are incorporated in a vast number of other products such as meat pies, hamburgers, steak and kidney puddings, sausages, stuffings, stocks and cubes for gravies. The demand for these products is met almost entirely by imported dehydrated onions and onion powder. Considerable quantities of fresh onions are used for inclusion in frozen foods particularly beefburgers, rissoles and cornish pasties but only small quantites are canned. Onion oil which is much more concentrated than powder is used for flavouring savoury foods. Most of the requirements are supplied from domestic production and some of the oil is exported.

Section 2 THE PRODUCTION ECONOMICS OF THE 1977 CROP

1. The Sample

The sample was obtained from a stratified random list where the number of growers in each size group was proportional to the total area grown in that size group in 1976, excluding growers with less than 0.4 hectares. This weighted the sample in favour of the growers with the larger areas. The distribution of the sample within the size groups is given in Table 3.

Table 3 The Size Structure of the Sample

Size Group		The Sample			Total Area	
		No. of Growers	Area Grown	Proportion	Area Grown in 1976	Proportion
	hectares		hectares	%	hectares	%
1	0.4 to 1.9	9	13.24	2	941	15
2	2.0 to 3.9	9	27.44	4	771	12
3	4.0 to 7.9	11	81.07	13	1109	18
4	8.0 to 12.0	8	79.00	13	719	10
5	Over 12.0	18	428.28	68	2942	45
TOTAL		55	629.03	100	6482	100

These figures relate to both the spring-sown and autumn-sown crops and only one grower growing the autumn crop did not also have spring-sown onions. The two crops are treated separately in this section and their distribution in the size groups is given in Appendix Table 5. The results for the spring-sown crop are shown in three size groups - Group A, 0.4 to 3.9 hectares (groups 1 & 2 combined); Group B, 4.0 to 12.0 hectares (groups 3 & 4 combined); and Group C (group 5) - where appropriate. These approximate to groups of 1 to 10 acres, 10 to 30 acres and 30 acres and above.

The geographical distribution of the sample by county is shown in Table 4 together with the figures for the total area in 1977. This comparison indicates that the sample is quite well distributed geographically. The separate geographical distribution of the spring-sown and autumn-sown crops is shown in Appendix Table 6.

Table 4 Geographical Distribution of Sample by County

County	The Sample			Total Area	
	No. of Growers	Area Grown	Proportion	Area Grown	Proportion
		hectares	%	hectares	%
Lincolnshire	28	225.83	36	3129	42
Nottinghamshire	2	23.90	4	56	1
Cambridgeshire	12	175.51	28	2299	31
Essex	3	46.20	7	187	2
Norfolk	8	145.40	23	1266	17
Suffolk	2	12.20	2	303	4
Others	-	-	-	194	3
Total	55	629.04	100	7434	100

The sample is thus reasonably representative of the geographical distribution within the main onion growing area of the country and is weighted towards the growers of the bigger areas who grew nearly half the total crop.

The pattern of farming on the farms in the sample is demonstrated in Table 5. These figures show that the farms are predominantly arable with only a very small proportion of the area in grass and with half the arable area in roots and vegetable crops.

Table 5 The Pattern of Farming

	Average Area per Farm	Proportion
	hectares	%
Wheat	58.29	32.44
Barley	21.28	11.84
Oats and Other Cereals	1.07	0.59
Oilseed Rape	1.30	0.73
Sugar Beet	21.74	12.10
Potatoes	18.97	10.56
Onions - Spring-Sown	12.08	6.72
Autumn-Sown	1.02	0.56
Other Vegetable Crops	34.80	19.37
Fallow	0.84	0.47
Total Arable	171.39	95.38
Temporary Grass	0.76	0.42
Permanent Grass	7.55	4.20
Total Grass	8.31	4.62
TOTAL CROPS AND GRASS	179.70	100.00

2. Husbandry

2.1 Soil Type and Rotation

The range of soil types on which onions can be grown is limited. Nearly threequarters of the area in the sample lay on mineral and organic fen soils. Of the rest, a little over ten per cent of the total was grown on sandy soils and ten per cent on light and medium loam. Only 4½ per cent of the sample was grown on what was described as heavy loam or clay soil.

Few of the growers admitted to having a definite rotation. Onions commonly followed cereals, particularly winter wheat, but they were in turn followed by a variety of crops. Most growers favoured a break of at least six or seven years between crops of onions.

2.2 Seed

The varieties of seed grown are shown in Table 6. The two Rijnsburgers, Robusta and Wijbo were the most popular varieties accounting for 35% of the spring-sown areas between them. The hybrid Hygro and the Rijnsburgers Balstora and Fenman were the only other varieties sown on any significant area. Nevertheless, a large number of other varieties were grown covering a third of the total area. Only 17.83 hectares, about three and a half per cent of the total area, were sown to a specific pickling variety by three growers who also grew ware varieties. Others sold for pickling were graded out of the ware crop. Produrijn, the most popular variety in 1971, had clearly been superseded by 1977. Of the autumn-sown varieties, Senshyu was sown on nearly two-thirds of the area with Express Yellow the only other variety of any note.

The spring crop was sown in single rows, in double rows or in beds, but there was considerable variation of method within these three broad categories. Of the 52 growers reporting, 19 growing 159 hectares sowed in single rows, 6 covering 65 hectares in double rows and 27 growing 337 hectares in beds. Four of the growers sowing in singles used scattered rows. In general those growing the larger areas favoured beds but two growing over 30 hectares used single scattered rows.

Of the autumn crops, four (16 hectares) were grown in single rows, one (1.60 hectares) in double rows and three (33 hectares) in beds with one grower not reporting.

Table 6 Varieties Grown

(a) Spring-Sown

Variety	Number of Growers	Area Grown	Proportion of Total Area
		hectares	%
Rijnsburger Robusta	26	132.97	26.51
Rijnsburger Wijbo	22	92.04	18.35
Hygro	11	40.37	8.05
Rijnsburger Balstora	10	34.13	6.80
Rijnsburger Fenman	6	34.40	6.86
Hydeal	6	10.26	2.05
Rijnsburger Goldball	5	12.98	2.59
Rijnsburger Rivato	5	12.72	2.54
Rijnsburger Jumbo	3	19.45	3.88
Rijnsburger	3	6.40	1.28
Earliest of All	2	14.15	2.82
Old Brown (picklers)	2	5.68	1.13
Early Dirkslander	2	5.63	1.12
Compass	2	2.92	0.58
Rijnsburger Rijnsburger S65	2	4.87	0.97
Newbrown (picklers)	1	12.15	2.42
Garnett	1	8.20	1.63
Rijnsburger Heldis	1	2.04	0.41
Danver Yellow Globe	1	1.40	0.28
Rijnsburger Produrijn	1	1.30	0.26
Rijnsburger Rheingold	1	1.10	0.22
Waldo Rijnsburger	1	13.43	2.68
Early Jubulati	1	7.29	1.45
Mabol	1	5.66	1.12
Hundrop 65	1	6.07	1.20
Hyduro	1	4.00	0.80
American	1	2.82	0.56
Boston Prize	1	2.02	0.40
Laco	1	2.02	0.40
Elsoms Maincrop	1	2.03	0.40
Elsoms Eterna	1	1.21	0.24
TOTAL		501.71(1)	100.00

(1) Details not available for 4 growers 75.40 hectares

(b) Autumn-Sown

Variety	Number of Growers	Area Grown	Proportion of Area
		hectares	%
Senshyu	6	32.26	62.14
Presto	4	4.84	9.32
Express Yellow	3	10.50	20.22
Imai Early Yellow	2	2.01	3.87
Keepwell	2	1.90	3.66
Extra Early Kaizuka	1	0.41	0.79
Total		51.92	100.00

The average seed rate for the main ware varieties was 4.1 Kg per hectare. Pelleted seed was used on 27 hectares sown at an average rate of 15.7 Kg per hectare.

2.3 Fertiliser Application

A dressing of compound fertiliser was applied to the whole area of the spring and autumn sown crops. In addition straight nitrogen was applied to four spring crops at an average of 110 Kg per hectare dressed and to 8 of the 9 autumn crops at an average of 162 Kg per hectare dressed. The average rates of application of nitrogen phosphate and potash to both crops are shown in Table 7.

Table 7 — Fertiliser Application — Spring-Sown and Autumn-Sown Crop

	Spring-Sown		Autumn-Sown	
	Kg/Ha	Ratio	Kg/Ha	Ratio
N	114 (1)	1.00	219 (2)	1.88
P	132	1.16	116	1.00
K	185	1.62	159	1.37

No details on 2 spring sown crops covering 40.9 ha.

(1) Including average of 16 Kg/Ha applied as top dressing by 4 growers @ 110 Kg/Ha dressed.

(2) Including average of 137 Kg/Ha applied as top dressing by 8 growers @ 162 Kg/Ha dressed.

2.4 Crop Protection

The area sprayed with herbicides, insecticides and fungicides is shown in Table 8. On average the whole area of the spring-sown crop was covered just over three times and the autumn-sown a little over two and a half times with herbicide.

Table 8 Spray Application

	Spring-Sown		Autumn-Sown	
	Area Treated	Proportion of Area Grown	Area Treated	Proportion of Area Grown
	hectares (1)	%	hectares	%
Herbicides	2395.5	415	204.7	394
Insecticides	338.8	59	9.3	18
Fungicides	267.6	46	6.8	13
Manganese	68.0	12	-	-
Sprout Suppressants	278.1	48	-	-

(1) Treated with one proprietary spray

Nearly all the insecticide used was aldicarb for the control of stem eelworm. Nearly half (46%) of the area of the spring-sown crop and just under one fifth (18%) of the autumn-sown crop was treated. The remaining spring-sown area treated (13%) was sprayed mainly with aphicides.

Over a third (37%) of the area of spring and autumn sown crops were treated with fungicide. This was almost equally divided between zineb, benomyl and carbendazim with a very small area treated with thiocarbamate. The seed was generally purchased routinely dressed with a fungicide seed dressing containing benomyl and thiram. Three growers, one on sandy soil and two on black fen covering 68 hectares applied manganese. Sprout suppressant (maleic hydrazide) was applied to 278 hectares.

A detailed analysis of the types of herbicides used on the spring-sown crop is shown in Table 9(a). Paraquat was used as a pre-emergence contact on 65% of the area. Over three quarters of the area was treated with the pre-emergence contact and residual, methazole, and the pre-emergence residuals, propachlor, chlorpropham, and pyrazone/chlorbufam (4) were also used extensively. Most of the propachlor (80%) was applied mixed with chlorpropham for the control of established chick-weed or with paraquat and 210 hectares were treated with a mixture of all three. Both paraquat and chlorpropham were used on their own in only a few instances. In all, 145 hectares were treated with a mixture of two proprietary chemicals and 222 hectares were covered with a mixture of three. The mixture of three chemicals was favoured mostly by those growing larger areas. Some chemicals were used twice on the same area, the most common being pyrazone/chlorbufam which was sprayed twice on 50 hectares.

(4) / denotes proprietary mixture of two chemicals.
Pyrazone is now known as Chloridazon

Table 9

Types of Herbicide Used

Type of Herbicide	Active Chemical	No. of Growers	Area Treated	Proportion of Area Grown
(a) Spring-Sown			hectares	%
Pre-drilling incorporation	Tri-allate	8	118.6	21
Pre-emergence contact	Paraquat	29	376.0 (1)	65
	Dimexan	4	71.1	12
Pre-emergence residual	Propachlor	28	355.8 (2)	62
	Chlorpropham	20	321.7 (3)	56
	Pyrazone/Chlorbufam (8)	27	284.6 (4)	49
	Chlorpropham and Fenuron	1	19.4	3
Pre-emergence contact and residual	Methazole	38	468.1	81
	Ioxynil/Linuron (8)	8	134.2	23
	Cyanazine	9	132.1	23
Post-emergence contact	Ioxynil	8	69.6	12
	Dinoseb	2	25.9	5
(b) Autumn-Sown				
Pre-drilling incorporation	Tri-allate	1	24.3 (5)	47
Pre-emergence contact	Paraquat	2	36.4	70
Pre-emergence residual	Propachlor	4	38.0 } (6)	73
	Chlorpropham	4	38.0 }	73
	Pyrazone/Chlorbufam (8)	5	13.9	27
Post-emergence contact residual	Methazole	7	32.2 (7)	62
	Cyanazine	1	7.3	14
Post-emergence contact	Ioxynil	2	14.6	28

Notes (1) Applied mixed with other chemicals on 322 ha
(2) Applied mixed with other chemicals on 283 ha
(3) Applied mixed with other chemicals on 285 ha
(4) Applied mixed with other chemicals on 62 ha
(5) All applied with proprachlor and chlorpropham
(6) All applied together
(7) Including 1.6 ha treated twice
(8) / denotes proprietary mixture of two chemicals
Pyrazone is now known as chloridazon

More than one herbicide was also often applied in separate applications; 202 hectares were treated with pyrazone/chlorbufam and methazole, 178 hectares with proprachlor and methazole and 59 hectares were covered by all three. In addition another 336 hectares were treated with ioxynil/linuron, ioxynil alone or cyanazine in conjunction with one or more of the other three chemicals.

More sprays were used and mixtures of proprietary chemicals were more popular on the larger areas. Thus growers in Group A on average gave 2.18 treatments to their area whereas those in Group B and C gave 3.79 and 4.72 treatments respectively, (Table 10).

Table 10 Use of Herbicides Spring-Sown Crop

	Area Treated	Proportion of Area Grown	Average No. of Treatments per crop	Average No. of Applications per crop
	hectares	%		
Group A	71.6	215	2.18	1.76
Group B	486.7	348	3.79	2.90
Group C	1837.2	455	4.72	3.72
All Farms	2395.5	415	3.59	2.78

The maximum number of proprietary chemicals applied by any one grower was eight, two being applied as a mixture.

The herbicides used on the autumn-sown crop are shown in Table 9(b) and are similar to those used on the spring-sown crop.

2.5 The Use of Labour and Machinery

Because of the heavy reliance on casual and contract labour for grading and harvesting by hand which was seldom paid at an hourly rate, figures for labour and tractor usage can only be given up to harvest for the whole sample. These are shown in Table 11 separated into three categories of operation - ploughing, working down and drilling, and post-drilling operations. These figures include an estimation of the hours worked by contract and casual labour. They show little difference between the large and small areas of the spring-sown crop, although the use of both labour and tractors is a little more per hectare in Group A than in the other two groups. The very wide range is due to the variation in the use of casual labour for hand-weeding and again there is little difference between

the size groups. The requirements of the autumn-sown crop are higher than the spring-sown, again largely because of the greater use of casual labour for hand-weeding.

Table 11 Average Use of Labour and Tractors Up to Harvest

Operation		Spring				Autumn
		Group A	Group B	Group C	All Farms	All Farms
Ploughing	Man Hours	4.1	3.5	3.0	3.2	2.1
	Tractor Hours	4.1	3.5	3.0	3.2	2.1
Working down and drilling	Man Hours	8.5	7.7	8.5	8.3	11.4
	Tractor Hours	7.9	7.2	8.0	7.8	10.9
Post-drilling	Man Hours (1)	51.2	46.2	47.6	47.4	77.3
	Tractor Hours	10.4	7.6	8.2	8.1	6.3
Total	Man Hours	63.8	57.4	59.1	58.9	90.8
	Tractor Hours	22.4	18.3	19.2	19.1	19.3
Range	Man Hours	34.2 to 145.0	10.2 to 117.2	26.0 to 150.9	10.2 to 150.9	22.0 to 162.3
	Tractor Hours	13.4 to 36.4	10.3 to 34.5	10.1 to 32.3	10.1 to 36.4	10.6 to 37.3

(1) Including hand-weeding by casual labour:-

Group A	16.03 hours per hectare
B	25.43 hours per hectare
C	30.69 hours per hectare
All Farms	28.07 hours per hectare

The use of different-sized tractors owned by the farmers as a proportion of the total use on the crop is shown by size group in Table 12. The most commonly used tractors were in the medium sized group of 50 to 80 h.p. Large tractors were used mainly for ploughing on the bigger farms.

Table 12 Size of Growers' Tractors and Hours Employed as a Proportion of Total Use on the Crop

Percentage

	Under 50 h.p.	50-80 h.p.	Over 80 h.p.	Total
Group A	46	52	2	100
Group B	34	62	4	100
Group C	25	67	8	100
All Farms	28	65	7	100

Table 13 Method of Harvesting Spring-sown Crop

	Group A		Group B		Group C		All Farms	
	No.of Farms	Area	No. of Farms	Area	No. of Farms	Area	No. of Farms	Area
		hectares		hectares		hectares		hectares
Hand Harvested	6	9.21	2	8.80	-	-	8	18.01
Part Hand, Part Mechanically	-	-	1	10.50	1	24.30	2	34.80
Mechanically Harvested	9	21.65	16	120.57	17	379.68	42	521.90
Contract Harvested	2	2.40	-	-	-	-	2	2.40
Total	17	33.26	19	139.87	18	403.98	54	577.11

Table 14 Labour and Tractor Requirements for Harvesting Mechanically Spring-sown Crop

hours per hectare

	Group A		Group B		Group C		All Farms	
	Labour	Tractor	Labour	Tractor	Labour	Tractor	Labour	Tractor
Topping	0.28	0.28	0.60	0.60	1.81	1.81	1.45	1.45
Undercutting and Windrowing	2.10	1.54	1.93	1.93	1.54	1.32	1.66	1.48
Lifting and carting to store	48.12	28.08	42.68	20.71	31.32	17.30	34.78	18.58
Total	50.50	29.90	45.21	23.24	34.67	20.43	37.89	21.51

2.6 Harvesting

The areas harvested by hand and mechanically are shown in Table 13. A third of the growers in Group A harvested their crops by hand whilst two brought in contractors to harvest them mechanically. All the others harvested their crops mechanically except for two; one in Group B, and one in Group C both of whom harvested part by hand.

Because of the difficulty of determining the time worked by casual labour in gangs picking by hand, no figures can be given for the labour and tractor requirements for hand-harvesting. Those for mechanical harvesting are given in Table 14. These results show advantages in size of operation in the use of labour and tractors more clearly than in the pre-harvest operations.

3. Financial Results

3.1 The Spring-Sown Crop

The financial results are shown for the whole sample in Table 15 together with the range for each item. Because of the wide variation in the use of casual and contract labour a margin over material costs (seeds, fertilisers and sprays) is shown as well as the gross margin. However, the gross margin has less meaning for this crop than it has for many others because of the inter-relationship between casual, contract and regular labour and the wide variation in the substitution of one by the other on different farms. Nevertheless, the gross margin is shown so that comparison can be made outside the sample. Furthermore, the distinction between variable and fixed costs is useful as it indicates the relative reliability of the data in that the variable costs are all as recorded at prices actually paid, whereas the fixed costs all involve some element of estimation or use of standard costs as detailed in the notes to Table 15.

It proved impossible to obtain a satisfactory estimate of yield out of the field and therefore of waste, so only the yield of crop actually sold is shown. The average yield for the whole sample is considerably lower than the MAFF estimate for the whole crop and so is the price per tonne received. This is similar to the position in 1971.(5)

---

(5) Kerr, H.W.T. op. cit.

Table 15 Financial Results Spring-Sown Crop Whole Sample

		Average	Range
Area Grown per farm	ha	10.69	0.40 to 75.40
Sales per hectare	tonnes	22.54	1.25 to 48.19
Average price per tonne sold	£	31.62	7.51 to 68.44
		£ per hectare	
OUTPUT		712.80	25 to 1994
Variable Costs:			
Seeds		94.56	28 to 168
Fertilisers		83.48	45 to 178
Sprays(1)		116.26	19 to 208
Sub-Total		294.30	199 to 435
MARGIN over MATERIAL COSTS		418.50	(-) 335 to 1741
Contract - General		4.93	Nil to 86
Haulage		8.12	Nil to 186
Contract/Casual Grading & Sorting(2)		90.23	Nil to 746
Other Casual(2)		54.96	Nil to 138
Fuel/Electricity for Drying		56.04	Nil to 332
Miscellaneous		74.20	Nil to 675
Sub-Total		288.48	16 to 914
TOTAL VARIABLE COSTS		582.78	222 to 1342
GROSS MARGIN		130.02	(-) 498 to 1587
Fixed Costs:			
Regular Labour(2)		226.97	66 to 801
Tractor Operating Costs		78.28	18 to 203
Tractor Overhds & Share Gen. Equip.		78.28	18 to 203
Special Equipment Depreciation		76.59	Nil to 314
Repairs		15.07	Nil to 104
Special Buildings Depreciation		106.48	Nil to 437
Rent		82.41	40 to 140
General Overheads		25.15	23 to 29
TOTAL FIXED COSTS		689.23	280 to 1229
TOTAL COSTS		1272.01	545 to 2354
NET MARGIN		(-) 559.21	(-) 1389 to 582

(1) Further analysis of spray costs see Appendix Table 7

(2) Total Labour Average £372.16

Notes to Table 15

Variable Costs

All as recorded

Regular Labour

Charged at £1.44 (M.A.F.F. Wages Enquiry average for tractor drivers, Jan to Dec 1977) plus 30% allowance for overheads = £1.87 applied to actual physical data recorded in survey.

Hours of regular labour used are shown in Appendix Table 8.

Tractor Operating Costs

Actual physical data recorded in survey charged as follows:

up to 50 h.p.	£1.41 per hour
50 h.p. to 80 h.p.	£1.71 per hour
over 80 h.p.	£3.43 per hour

to cover depreciation and repairs. Tax and insurance allowed for in General Overheads.

Hours of owners' tractors used are shown in Appendix Table 9.

Tractor Overheads and Share of General Machinery

Charged at £1 per £ of direct tractor cost.

Specialised Machinery

Current cost depreciation calculated by diminishing balance @ 20% from recorded initial purchase price up-dated by M.A.F.F. machinery indices. Repairs as recorded.

Specialised Buildings

Recorded initial cost updated by M.A.F.F. buildings index depreciated by straight line method over 10 years.

Rent

As recorded - actual for tenanted farms, raised rental value for owner-occupied farms.

General Overheads

Average Maintenance plus Miscellaneous costs for "Arable - Roots and Vegetable" farms - Farming in the East Midlands 1977-78 as follows:-

Farms less than 100 ha.	£28.98 per ha.
Farms 100 to 199.99 ha.	£27.48 per ha.
Farms over 200 ha.	£23.12 per ha.

The average financial results for the three size groups are shown in Table 16. The assumptions used for assessing the fixed costs are the same as those given in the notes to Table 15.

Table 16 Financial Results Spring-Sown Crop by Size Group

		Group A	Group B	Group C	All Farms
Number of Farms		17	19	18	54
Area Grown per farm	ha	1.94	7.36	22.44	10.69
Sales per hectare	tonnes	26.16	24.12	21.70	22.54
Average price per tonne sold	£	27.26	30.61	32.44	31.62
		£ per hectare			
OUTPUT		713.00	738.19	703.99	712.80
Variable Costs:					
Seeds		104.68	96.61	93.01	94.56
Fertilisers		79.05	91.31	81.14	83.48
Sprays		78.95	126.58	115.76	116.26
Sub-Total		262.68	314.50	289.91	294.30
MARGIN over MATERIAL COSTS		450.32	423.69	414.08	418.50
Contract - General		6.83	9.41	3.22	4.93
Haulage		1.29	17.16	5.55	8.12
Contract/Casual Grading & Sorting	(1)	7.80	121.20	86.30	90.23
Other Casual	(1)	52.39	35.73	61.83	54.96
Fuel/Electricity for Drying		8.85	36.36	66.74	56.04
Miscellaneous		77.09	89.64	68.61	74.20
Sub-Total		154.25	309.50	292.25	288.48
TOTAL VARIABLE COSTS		416.93	624.00	582.16	582.78
GROSS MARGIN		296.07	114.19	121.83	130.02
Fixed Costs:					
Regular Labour	(1)	331.25	247.45	211.29	226.97
Tractor Operating Costs		91.07	76.79	77.75	78.28
Tractor Overhds. & Share Gen. Equip.		91.07	76.79	77.75	78.28
Special Equipment Depreciation		75.23	72.51	78.11	76.59
Repairs		11.12	13.92	15.77	15.07
Special Buildings Depreciation		49.22	101.23	113.03	106.48
Rent		73.47	81.77	83.37	82.41
General Overheads		28.09	27.27	24.18	25.15
TOTAL FIXED COSTS		750.52	697.73	681.25	689.23
TOTAL COSTS		1167.45	1321.73	1263.41	1272.01
NET MARGIN		(-) 454.45	(-) 583.54	(-) 559.42	(-) 559.21
Range		(-) 1137 to (-) 9	(-) 1289 to (+) 582	(-) 1389 to (+) 220	(-) 1389 to (+) 582
(1) Total Labour		391.44	404.38	359.42	372.16

These results show clearly the very high costs of growing onions. In this particular year output was nowhere near high enough to cover these costs. This was mainly due to the low price received which in real terms (price adjusted by retail price index) was only a little better than that received in the poor year of 1971.[6] Although some advantage was shown by farms in Group C in the cost of labour and machinery, this was offset compared with farms in Group A by higher expenditure on drying and specialised buildings. Group B also spent more than Group A (but less than Group C) on drying and specialised buildings and, in addition, had a higher total labour bill, so returned the worst net margin of the three groups.

3.2 The Autumn-Sown Crop

The average financial results for the nine autumn-sown crops are shown in Table 17 together with the average results of the spring-sown crops. The total cost of growing the two crops shows a remarkable similarity. The aim of growing autumn-sown onions is to get them onto the market before the spring-sown crop and so obtain a higher price. In the event the price received per tonne for the autumn-sown crop was almost three times that of the spring-sown crop in 1977 this was entirely responsible for there being a positive instead of a negative net margin. Although drying is essential to obtain a good quality, the cost of fuel for drying and the depreciation of specialised buildings was lower and this mainly offset the considerably higher cost of seed.

---

(6) Kerr, H.W.T. op. cit.

Table 17 Financial Results Autumn-Sown Crop and Spring-Sown Crop

All Farms

		Autumn-Sown	Spring-Sown
Number of Farms		9	54
Area grown per farm	ha	5.77	10.69
Sales per hectare	tonnes	20.26	22.54
Average price per tonne sold	£	91.51	31.62
		£ per hectare	
OUTPUT		1853.97	712.80
Variable Costs:			
Seeds		196.55	94.56
Fertilisers		97.01	83.48
Sprays(1)		95.93	116.26
Sub-Total		389.49	294.30
MARGIN over MATERIAL COSTS		1464.48	418.50
Contract - General		4.91	4.93
Haulage		11.86	8.12
Contract/Casual Grading & Sorting(2)		4.04	90.23
Other Casual(2)		143.07	54.96
Fuel/Electricity for Drying		4.77	56.04
Miscellaneous		99.34	74.20
Sub-Total		267.99	288.48
TOTAL VARIABLE COSTS		657.48	582.78
GROSS MARGIN		1196.49	130.02
Fixed Costs:			
Regular Labour(2)		214.17	226.97
Tractor Operating Costs		78.19	78.28
Tractor Overhds & Share General Equip.		78.19	78.28
Special Equipment Depreciation		100.77	76.59
Repairs		14.31	15.07
Special Buildings Depreciation		42.87	106.48
Rent		64.90	82.41
General Overheads		25.58	25.15
TOTAL FIXED COSTS		618.98	689.23
TOTAL COSTS		1276.46	1272.01
NET MARGIN		577.51	(-) 559.21
Range		(-) 409 to (+) 2797	(-) 1389 to (+) 582

(1) Further analysis of spray costs see Appendix Table 7

(2) Total Labour Autumn-sown £361.28
Spring-sown £372.16

3.3 Capital Investment

The capital investment in specific machinery for growing onions is shown by size group in two different ways. In Table 18 investment is shown at replacement cost indicating what it would cost to start growing onions at 1977 prices. The replacement cost was determined by adjusting the original purchase prices by MAFF machinery indices. In Table 19 the investment is shown at its current (1977) value; that is the replacement cost written down at 20% diminishing balance in the case of machinery and at 10% straight line for buildings.

Table 18 Capital Investment at Replacement Value by Size Group

£ per hectare

	Group A	Group B	Group C	All Farms
Drills	25.74	27.71	29.79	29.05
Cultivating Machinery (1)	5.33	16.14	11.12	12.00
Harvesting Machinery (2)	333.03	312.97	298.65	304.11
Grading and Riddling Machinery	219.06	240.03	184.10	199.67
Drying and Storage (3)	340.83	177.55	152.73	169.58
Total Machinery and Equipment	923.99	774.40	676.39	714.41
Buildings	1031.60	1036.87	1169.81	1129.63
Total	1955.59	1811.27	1846.20	1844.04

(1) Hoes, Sprayers

(2) Toppers, Undercutters, Windrowers, Harvesters

(3) Fans, Ducts, Blowers

Table 19 Capital Investment at Current Value by Size Group

£ per hectare

	Group A	Group B	Group C	All Farms
Drills	2.61	7.98	13.10	11.25
Cultivating Machinery (1)	3.31	8.70	5.05	5.84
Harvesting Machinery (2)	126.31	124.11	148.73	141.48
Grading and Riddling Machinery	108.36	93.02	61.46	71.81
Drying and Storage (3)	121.28	72.39	55.08	63.09
Total Machinery and Equipment	361.87	306.20	283.42	293.47
Buildings	248.77	639.74	660.89	632.01
Total	610.64	945.94	944.31	925.48

(1) Hoes, Sprayers

(2) Toppers, Undercutters, Windrowers, Harvesters

(3) Fans, Ducts, Blowers

These figures clearly demonstrate the high capital investment involved in growing onions. Advantages of size are shown in the investment in total machinery and equipment at replacement cost and to a lesser extent at current value. But the position is completely reversed at current value when specialist buildings are included. At replacement cost there are only small differences between the groups in investment in specialist buildings indicating that growers with the larger areas have much newer buildings than those in Group A. Advantages of size shown at replacement cost in harvesting machinery are also reversed when investment is assessed at current value because the growers with smaller areas use older machines, employ contractors or harvest by hand.

Section 3 CONCLUSIONS

The results confirm that 1977 was not a good year for the majority of onion growers. This was due more to the poor price received than to low saleable yields. The variation about the mean was very wide; positive net margins were achieved but only by three of the 54 growers of the spring-sown crop included in the sample. Adjusted for changes in the purchasing power of money, the average price received per tonne by the growers in the sample was no better than the average price obtained in 1971 (another bad year) and was less than half that of the three years 1972, 1973 and 1974. Clearly a satisfactory net margin will only be achieved at average saleable yields if a better average price than that of 1977 can be obtained.

The autumn-sown crop did fetch a much better price (nearly three times that for the spring-sown) and at a very similar total cost of production this produced an acceptable average net margin. A further analysis of the three spring-sown crops achieving a positive net margin showed their average total cost of production to be almost identical to that of the spring-sown and autumn-sown crops (Table 21). The reason for the growers obtaining a positive net margin is clearly seen to be the much higher output resulting from a combination of the higher than average yield and price received.

Table 21 Comparision of the Main Physical and Financial Factors

	Average Three Spring-Sown Crops with Positive Net Margins	Average Spring-Sown Crops	Average Autumn-Sown Crops
	tonnes	tonnes	tonnes
Yield (sales) per hectare	27.87	22.54	20.26
	£	£	£
Average price per tonne	51.75	31.62	91.51
Output per hectare	1442	713	1854
Total Costs per hectare	1277	1272	1276
Net Margin per hectare	165	(-) 559	578

It would appear that as a broad guide the total cost of growing the crop should fall somewhere between £1,000 and £1,500 per hectare at 1977 money values. On a low cost regime yield and, particularly, quality may well be sacrificed whereas costs of production rising above £1,500 will not usually leave a big enough margin at prices likely to be realised.

The area of bulb onions grown in 1978 in England and Wales fell by about just over 1000 hectares to 7587 hectares according to the June census. Prices received rose and probably averaged around £60 per tonne for the spring-sown crop which at the average yield achieved in the 1977 sample would have produced no better than a break-even return. In 1979 the area again fell by over 1000 hectares to 6371 hectares and prices so far (November 1979) appear to be about double those during the same period of the previous year. If this level is maintained, it should bring the crop back into profitability for the average producer despite the increase in cost which has taken place since 1977.

The price which domestic producers receive is dependent upon the overall supply and demand situation, the quality of the crop and the marketing period. The demand for onions is relatively price inelastic and hence fluctuations in total supplies result in volatile price movements. This volatility may be dampened to some extent by the compensatory role which imports play. Within the overall supply and demand situation the prices which growers receive are dependent on the quality of the crop. There is a clear price differential in favour of imported onions. The potential for an expansion of home production and the displacement of imports centres on the ability of domestic growers to match imports in terms of volume, consistency and quality. Additional marketing opportunities are available to individual producers to orientate their sales towards the seasonal high-price periods.

The relationship between price, quality and marketing period has been clearly established in this study. Autumn-sown crops fetched nearly three times the price of the spring-sown. Furthermore, the three growers achieving positive net margins in the spring-sown sample received £51.75 per tonne compared with the average price of £31.62 per tonne.

A fundamental problem in the onion market is the reaction of the growers to price fluctuations. If adverse climatic conditions which reduce production are accompanied by short supplies in international trade, then prices escalate. The rise in price causes both an expansion in the area by existing producers and an increase in the number of growers. If the expansion in the area grown is combined with above average yields the following year the increase in domestic production must be accompanied by a reduction in imports if prices are to remain relatively stable. The displacement of imports, however, can only be achieved if domestic growers market onions of comparable quality and extend the marketing season. Failure to meet this objective results in only a partial displacement of imported supplies and the increase in total supplies depresses prices. Furthermore, as prices fall the differential paid for quality widens and growers marketing crops of indifferent quality suffer substantial financial loss. The potential displacement of imports is, therefore, clearly dependent on the quality of the crop and the extension of the marketing season.

Additional price premiums may also be achieved if producers can exert countervailing power. The increasing dominance of the retail multiples and the extension of vertical co-ordination within the marketing system suggest that countervailing power may be a pre-requisite for improving returns from the market for the grower. The formation of efficient marketing groups which can identify buyers' requirements and orientate production and marketing methods to fulfilling these needs may be necessary if the production of onions is to be an attractive proposition for home producers in the future.

Table 1 Total Supplies of Dry Bulb Onions in the U.K. Calendar Years

YEAR	Home Production		Imports		Total Supplies		Degree of Self Sufficiency	
	Tonnes	Value	Tonnes	Value	Tonnes	Value	Volume	Value
	'000'	£000	'000'	£000	'000'	£000	%	%
1970	82.4	2829	203.4	13262	285.8	16091	28.8	17.6
1971	145.6	2556	202.5	8474	348.1	11030	41.8	23.2
1972	160.2	3975	173.6	9323	333.8	13298	48.0	29.9
1973	153.8	7059	148.5	14837	302.3	21896	50.9	32.2
1974	172.0	8404	181.9	13529	353.9	21933	48.6	38.3
1975	194.8	14307	148.7	15040	343.5	29347	56.7	48.8
1976	153.8	22749	178.8	29571	332.6	52320	46.2	43.5
1977	184.9	13570	181.1	24584	366.0	38154	50.5	35.6
1978[a]	250.0	10582	179.3	17315	429.3	27897	58.2	37.9

(a) Forecast Source: MAFF

Table 2

Home Production of Dry Bulb Onions Calendar Years

YEAR	Estimated Crop Area Hectares	Estimated Yield/Hectare Tonnes	Gross Production '000' Tonnes	Output* '000' Tonnes	Average Farm Gate Price £/Tonne	Value of Output £000	Value Per Hectare £
1970	3745	32.52	121.8	82.4	34.33	2829	755.4
1971	5473	37.07	202.9	145.6	17.55	2556	467.0
1972	4927	33.94	167.2	160.2	24.81	3975	806.8
1973	5460	35.73	195.2	153.8	45.90	7059	1292.8
1974	6081	35.95	218.6	172.0	48.86	8404	1382.0
1975	6174	28.10	173.5	194.8	73.44	14307	2317.3
1976	7384	20.51	151.4	153.8	147.91	22749	3080.8
1977	8732	35.02	305.8	184.9	73.99	13570	1554.1
1978[a]	8585	32.07	275.3	250.0	42.33	10582	1232.6

(a) Forecast Source: MAFF

* Output refers to total marketings in a calendar year

Table 3

Total Supplies of Dry Bulb Onions in the U.K. Crop Year June/May

	Home Production							Imports		
Crop Year	Estimated Crop Area Hectares	Estimated Yield Tonnes Per Hectare	Gross Production '000' Tonnes	Output '000' Tonnes	Average Farm Gate Price £/Tonne	Value of Output £000	Value Per Hectare £	Quantity '000' Tonnes	Value £000 CIF	Average Value/Tonne £
1970/71	3745	32.52	121.8	112.3	28.43	3192	852.3	200.0	9910	49.55
1971/72	5473	37.07	202.9	175.4	15.07	2642	482.7	184.7	7457	40.37
1972/73	4927	33.94	167.2	134.1	40.49	5430	1102.1	168.1	14187	84.40
1973/74	5460	35.73	195.2	182.7	45.64	8338	1527.1	142.1	11251	79.18
1974/75	6081	35.95	218.6	191.4	44.04	8430	1386.3	165.3	12915	78.13
1975/76	6174	28.10	173.5	158.4	116.93	18521	2999.8	166.4	21711	130.47
1976/77	7384	20.51	151.4	136.9	158.66	21721	2929.7	189.3	30324	160.19
1977/78	8732	35.02	305.8	271.8	41.94	11399	1320.1	na	na	na

Source: MAFF H.M. Customs & Excise

APPENDIX

Table 4 Value of Total Supplies at Current Prices and at 1970 Prices

YEAR	Value of Total Supplies at Current Prices £000	Retail Price Index 1970 = 100	Value of Total Supplies At 1970 Prices £000
1970	16091	100.0	16091
1971	11030	109.5	10073
1972	13298	117.0	11366
1973	21896	128.0	17106
1974	21933	148.5	14769
1975	29347	184.5	15906
1976	52320	215.0	24335
1977	38154	249.0	15323
1978	27897	270.0	10332

Source: MAFF

Table 5 The Size Structure of The Sample

(a) Spring-Sown

Size Group	No. of Growers	Area Grown
hectares		hectares
1 0.4 to 1.9	8	8.62
2 2.0 to 3.9	9	24.64
3 4.0 to 7.9	11	60.87
4 8.0 to 12.0	8	79.00
5 Over 12.0	18	403.98
Total	54	577.11

(b) Autumn-Sown

Size Group	No. of Growers	Area Grown
hectares		hectares
1 0.4 to 1.9	4	4.62
2 2.0 to 3.9	1	2.80
3 4.0 to 7.9	3	20.20
4 8.0 to 12.0	-	-
5 Over 12.0	1	24.30
Total	9	51.92

APPENDIX

Table 6 Geographical Distribution by County

(a) Spring-Sown

County	No. of Growers	Area Grown
		hectares
Lincolnshire	27	211.93
Nottingham	2	23.90
Cambridge	12	142.28
Norfolk	8	145.40
Essex	3	41.40
Suffolk	2	12.20
Total	54	577.11

(b) Autumn-Sown

County	No. of Growers	Area Grown
		hectares
Lincolnshire	5	13.90
Cambridge	3	33.22
Essex	1	4.80
Total	9	51.92

Table 7 Analysis of Spray Cost

(a) Spring-Sown

	per hectare grown	per hectare sprayed
	£	£
Herbicide	79.59	25.12
Insecticide	23.80	40.53
Fungicide	6.39	13.79
Manganese	0.06	0.52
Sprout Suppressant	6.42	13.31
TOTAL	116.26	

(b) Autumn-Sown

	per hectare grown	per hectare sprayed
	£	£
Herbicide	89.84	33.56
Insecticide	4.29	23.97
Fungicide	1.80	13.72
TOTAL	95.93	

APPENDIX

Table 8 Regular Labour

hours per hectare

Spring-Sown				Autumn-Sown
Group A	Group B	Group C	All Farms	All Farms
177.14	132.33	112.99	121.37	114.53

Table 9 Growers' Tractors

hours per hectare

Spring-Sown				Autumn-Sown
Group A	Group B	Group C	All Farms	All Farms
55.22	46.61	44.63	45.72	39.80

LIST OF PUBLICATIONS ISSUED IN THE AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES SERIES

No.40	Fattening Older Cattle on Grass By H.W.T. Kerr and P.H. Pitchford, University of Nottingham April 1976	65p
No.41	Oilseed Rape: 1975 By S.M. Fletcher with J.A.L. Dench and R.L. Vaughan, University of Reading, September 1976	50p
No.42	The U.K. Broiler Industry 1975 By S. Richardson, University of Manchester, September 1976	£1.50
No.43	Sheep Production and Management in Wales: A Survey of 413 Flocks By A. Lloyd, University of Aberystwyth, March 1977	£1.00
No.44	Early Potato Production in England and Wales 1975 By A. Lloyd, University of Aberystwyth, January 1977	£1.00
No.45	The Tomato Industry Situation By J. Nicholson, Wye College (University of London), December 1977	£3.00
No.46	Ewe Flocks in England - Breeds, Lamb Production and Other Aspects of Husbandry 1973-74 By W.J.K. Thomas, University of Exeter, November 1976	£1.00
No.47	Cereals 1971-1977 By J.G. Davidson and I.M. Sturgess, University of Cambridge, October 1978	£2.00
No.48	Potatoes in Scarcity By L. Hinton, University of Cambridge, August 1977	£1.50
No.49	The Economics of Cider Apple Production By S.R. Wragg and J. Rendell, University of Bristol, February 1977 . .	60p
No.50	Fodder Crops By J.A.L. Dench and W.I. Buchanan, University of Reading, March 1977 .	70p
No.51	Pig Management Scheme - Results for 1976 By R.F. Ridgeon, University of Cambridge, December 1976	70p
No.52	Pig Production in SW England 1975/76 By E. Burnside, A. Sheppard and W.J.K. Thomas, University of Exeter, January 1977	75p
No.53	Oilseed Rape 1976 By S. Fletcher, University of Reading, 1977	75p
No.54	Hill and Upland Farming in the North of England By S. Robson and D.C. Johnson, University of Newcastle, May 1977 . . .	£1.50
No.55	National Mushroom Study 1975 By Peter Thompson, University of Manchester, June 1977	75p
No.56	Economics of Scale in Farm Mechanisation By F.G. Sturrock, J. Cathie and T.A. Payne, University of Cambridge, January 1978	95p

No.57	Lowland Sheep - Economics of Lamb Production in England 1976 By W.J.K. Thomas, University of Exeter, December 1977	£1.00
No.58	Hill and Upland Farming in Wales By A. Lloyd and W. Dyfri Jones, August 1978	£1.50
No.59	The Use of Fixed Resources in Cereal Production By H.W.T. Kerr, University of Nottingham, December 1977	£1.00
No.60	Pig Production in South West England 1976/77 By E. Burnside, A. Sheppard and W.J.K. Thomas, University of Exeter, January 1978	£1.00
No.61	Pig Management Scheme. Results for 1977 By R.F. Rudgeon, University of Cambridge, January 1978	£1.00
No.62	Beef Production from Older Cattle By R. Evans, University of Newcastle, December 1977	£1.50
No.63	The Economics of Egg Production - a Study of Production and Marketing on 70 Farms By D.A. Burton, University of Manchester, April 1978	£2.50
No.64	An Economic Survey of Lettuce Production in the Open By J.E. Farrar, University of Manchester, June 1978	£1.00
No.65	Pig Management Scheme. Results for 1978 By R.F. Ridgeon, University of Cambridge, January 1979	£1.00
No.66	Pig Production in South West England 1977-78 By W.J.K. Thomas, University of Exeter, January 1979	£1.50
No.67	Protected Lettuce By J. Rendell, University of Reading, December 1979	£1.00
No.68	Vining Peas By R.A. Macaskill, University of Nottingham, September 1979	£1.35
No.69	Pig Production in South West England 1978-79 By W.J.K. Thomas, University of Exeter, January 1980	£1.50

Note: A list of previous numbers can be obtained from M.A.F.F. (Economics Division 1), Whitehall Place, London, S.W.1.

BRISTOL	The Secretary, Department of Animal Husbandry, Bristol University Field Station, Langford House, Langford, Bristol. BS18 7DU
CAMBRIDGE	Agricultural Economics Unit, Department of Land Economy, University of Cambridge, Silver Street, Cambridge. CB3 9EL
EXETER	Agricultural Economics Units, Department of Economics, University of Exeter, Lafrowda, St. German's Road, Exeter. EX4 6TL
LEEDS	School of Economic Studies, The University of Leeds, Leeds. LS2 9JT
LONDON	School of Rural Economics & Related Studies, Wye College (University of London), Nr. Ashford, Kent. TN25 5AH
MANCHESTER	Department of Agricultural Economics, Faculty of Economic and Social Studies, University of Manchester, Manchester. M13 9PL
NEWCASTLE	Department of Agricultural Economics, The University, Newcastle-upon-Tyne. NE1 7RU
NOTTINGHAM	Department of Agriculture and Horticulture, The University of Nottingham, School of Agriculture, Sutton Bonington, Loughborough, Leicestershire. LE12 5RD
READING	Department of Agricultural Economics & Management, University of Reading, 4 Earley Gate, Whiteknights Road, Reading. RG6 2AR
WALES	Department of Agricultural Economics, The University College of Wales, School of Agricultural Sciences, Penglais, Aberystwyth, Dyfed. SY23 3DD

RECENT DEPARTMENTAL PUBLICATIONS
(still in stock)

Winter Fattening Older Cattle in Yards
By H.W.T. Kerr and P.H. Pitchford 65p

Summary Report No.2: - Maincrop Potatoes - The 1975 Crop
By R.J. Babington 25p

Summary Report No.3: - Lowland Sheep - The 1976 Lamb Crop
By R.A. Macaskill 30p

Summary Report No.5: - Dry Bulb Onions - The 1977 Crop
By H.W.T. Kerr 35p

Summary Report No.6: - Perennial Ryegrass Seed Production - The 1978 crop
By H.W.T. Kerr 35p

Farming in the East Midlands - Financial Results 1978-79 . . . . . £1.50