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Wheat - Cost of production (pd)



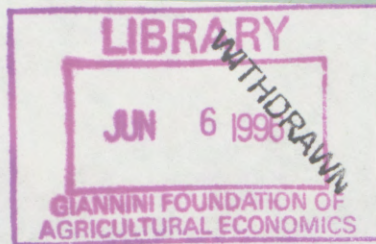
UNIVERSITY OF CAMBRIDGE

Dept. of land economy.
Agricultural economics
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**Wheat and Barley Production in Great Britain, 1994/95:
Year Two of the CAP Reform**

GEOFF DAVIDSON



UNIVERSITY OF CAMBRIDGE

Wheat and Barley Production in Great Britain, 1994/95:

Year Two of the CAP Reform

J. **GEOFF DAVIDSON**

Agricultural Economics Unit
Department of Land Economy
19 Silver Street
Cambridge CB3 9EP

Tel. 01223 337168

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Special Studies in Agricultural Economics

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. Since April 1978 this work has been supported in Wales by the Welsh Office following the transfer of responsibilities for agriculture to the Secretary of State for Wales.

The departments in different regions conduct joint studies of those enterprises in which they have a particular interest. This community of interest is recognised by issuing reports prepared and published by individual departments in a common series entitled *Studies in Agricultural Economics*. Titles of recent publications in this series are given in Appendix D.

This study also includes results for Scotland which were collected with financial support from the Scottish Office Agriculture. The addresses of all departments involved in the collection of data are given in Appendix E.

The basic information on which this report is based was originally collected on behalf of, and largely financed by, the Ministry of Agriculture, Fisheries and Food, the Welsh Office and the Scottish Office and is Crown Copyright.

Foreword

The report "UK Cereals, 1993/94" from this Unit established bench marks for all items of cost which will, be used, suitably updated, until a new complete survey of the 1998 crop is undertaken. For each interim year surveys of output and variable costs, using similarly tailor-made sampling and rigorous procedures, are being conducted. This bulletin reports on the 1994 harvest year, the sales from which were completed only some six months ago.

The report shows in detail how the EU Ministers of Agriculture have been frustrated once again by developments in world markets for cereals and national economies. To make the "MacSharry" compensation payments acceptable in the GATT round as decoupled from production, they could not be deficiency payments, directly varying with prices received. With unexpectedly high world prices, to the delight of farmers and the chagrin of public treasuries, there has been throughout the Union considerable overcompensation of cereal growers. This has been reinforced in the UK by the weakness of sterling in relation to the mark and franc, and therefore the ECU, which has directly increased the value of EU payments with as yet, limited effects on input costs.

The report shows how these and other factors have impacted, to the point of gross margins, on cereal units differing in crop specialisation, area, size and location. For the more discriminating reader many measures of dispersion as well as central tendency are given. This is especially critical in reports on agricultural businesses the performance of which varies widely.

Ian Sturgess
Director
March 1996

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At Cambridge the work of analysis and report preparation received a set-back when Carol Asby suffered serious health problems and subsequently was away from the department for several weeks recuperating. I am pleased to say that Carol is now restored to full health and has resumed her important role in the cereal survey. Inevitably Carol's absence placed additional responsibilities on three other colleagues in the Unit who help with the cereals work. It came as no surprise that the additional and often onerous responsibilities were willingly accepted or that the extra support was freely given and continued throughout the preparation and publication of this report. I owe a considerable debt of gratitude, in each case, to Joe Barker who checked and inputted most of the data, and in addition provided feed-back for other Universities and co-operating farmers, to Faisal Sabbah both for advice on computer programming and for his help in setting up a new system of analysis at a late and critical time in the report preparation and to Joy Meyrick who has produced a camera ready report of high quality from a series of often untidy notes. My thanks also to Ian Sturgess who has been a constant source of help and encouragement during this series of surveys, and most recently for his welcome advice in presenting the results of this survey. Finally my sincere thanks to the many cereal growers in Great Britain whose continuing help with our work has made this research project possible.

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Chapter 1

Summary and Conclusions

1.1 Introduction

The sections to which summary points refer are shown in parentheses after each point.

1.2 Sampling, Objectives and Methodology

1. This report is based on the findings of an economic survey of wheat and barley production for the 1994 harvest year and the grain marketing year ending July 1995. The survey data were collected from a sample of 401 farms located in England, Wales and Scotland. (2.1)
2. The decision to extend the 1993 cereals survey and to invite co-operators from that survey to continue to supply information was taken when rapidly changing circumstances promised that profits from cereal-growing would not decline as previously expected. Of the original 400 cereal growers who took part in the survey, twenty-five per cent felt unable or declined to take part in the extended survey. To replace these farms, 123 cereal producers were contacted, over 80 per cent of whom agreed to take part in the study. (2.2)
3. The study was designed as a gross margin survey, which would record the value of output from and the cost of variable inputs of winter and spring sown crops of wheat and barley. (2.2)
4. In Great Britain over half the cereals area is on the 15 per cent of holdings growing 80 ha or more of cereals. At the other extreme almost half the holdings growing cereals grow less than 20 ha and account for less than 10 per cent of the total cereals area. (2.2)

1.3 Wheat and Barley Production, Costs and Returns in Great Britain

5. The survey showed that on average winter wheat had the highest gross margin per hectare (£799), followed by winter barley (£711), spring wheat (£692) and spring barley (£665). (3.2)
6. For spring barley there are signs that the improved performance, evident in the 1993 survey, has continued into the 1994 harvest year. (3.2)
7. A comparison of the results for the 1993 and 1994 surveys showed the gross margins for winter- and spring-sown crops of wheat and barley to have increased significantly in real terms in 1994. Although the additional arable area payment, up by about £50 per hectare from 1993, has contributed to this change, for winter wheat, and more especially spring barley, the increase in output from grain and straw is a more important reason for the higher gross margin. (3.2)

1.4 Gross Margin Results by Country

8. By country, the most important change between the 1993 and 1994 harvest years has been the substantial increase in the grain yield achieved by wheat and barley growers in Scotland. In a year-on-year comparison of the results of the 1993 cereals survey and of this survey, the yield of spring barley increased by 12 per cent, of winter wheat by 10 per cent, and of winter barley by seven per cent. There were smaller but still important changes in England where the average yield for winter wheat improved by a little over three per cent and the average yields for both winter and spring barley by slightly less than two per cent between the 1993 and 1994 harvest years. For cereal growers in Wales the gross margins in 1994, for winter wheat and spring barley in particular, have improved considerably and have largely closed the performance gap which existed between England and Wales in 1993. (3.3)
9. When the results for the wheat and barley crops for the 1994 harvest year were aggregated to give a weighted average for a combined cereal enterprise, producers in Scotland had the highest combined gross margin followed by producers in England. This improved performance of growers in Scotland reversed the 1993 rankings. (3.3)
10. Between the 1993 and 1994 harvest years the arable area payment increased, except in the less favoured areas of Wales, by about £50 per hectare. In the 1994 harvest year the payment accounted for almost 18 per cent of output for winter wheat and nearly 20 per cent for spring barley; this compares with 14 and 17 per cent respectively in 1993. (3.3)

1.5 Gross Margin Results by Size of Enterprise

11. To reduce the possible effect of regional variation, the main analysis by size of cereal unit was confined to those counties in England where cereals account for more than 40 per cent of the crops and grass area. (3.4)
12. The results of this analysis show economic benefits as the size of cereal unit gets larger. The average yield of cereal tends to increase with size and, with some improvement in price, the value of grain output shows a similar increase. (3.4)
13. Between the size groups, there are only very small differences in the cost of material inputs, when measured on a per tonne basis. Any increase in material input cost is balanced by the reduction in other variable costs as the charge for contracting becomes less as the cereal unit gets larger. (3.4)
14. An analysis of wheat enterprises by size showed that whilst the quantity of fertiliser applied per hectare increases substantially as the wheat enterprise becomes larger, there are relatively small differences in the total cost per hectare between the small and large wheat units. This is the effect of purchasing power; for example, the largest producers were able to purchase

fertiliser of similar quality at a price 14 per cent below that paid by the smallest producers. (3.4)

1.6 Dispersion in Gross Margin

15. When, based on the margin over materials, the results for the upper twenty-five per cent of producers of winter wheat, winter and spring barley are compared with the results of growers in the lower quarter, the gross margins for the upper quarter farms ranged, according to crop, from 60 to over 100 per cent higher than the margins for the lower quarter group. The main reason for the difference in gross margin was the level of total output being significantly higher in the upper quarter farms. The single most important factor influencing the level of output was the yield of grain, which was from 42 to 52 per cent higher on the upper quarter farms. (3.5)
16. An analysis of average wheat yields for the three harvest years of 1992, 1993 and 1994 showed that 30 per cent of the farms which were in the lowest quarter for wheat yield in 1992, remained in this group over the whole three-year period. At the other extreme two-thirds of the farms which started in the upper yield quarter in 1992, continued to produce above average yields in 1993 and 1994. The most extreme changes in ranking came from just under 12 per cent of the farms which moved from the lower to upper wheat yield quarter between 1992 and 1994; a similar number of farms went from the upper to lower wheat-yield quarter during the same period. (3.6)

1.7 Marketing of Wheat and Barley

17. Sales of winter and spring wheat for milling earned premiums of 11 and 12 per cent respectively over the price paid for livestock feed. In marked contrast, the premium for malting barley was around 20 per cent higher than the price paid for barley intended for incorporation in livestock feed. (4.2)
18. The increased premium paid for barley of malting quality is having an impact, enabling maltsters to maintain their supplies and so effectively increase their share of the reduced total barley crop which is now available. (4.2)
19. The survey included a section to record details of price deductions for milling wheat and malting barley, made at the point of delivery but which were not anticipated when the grain left the farm. The results of this analysis indicate that price deductions were not as widespread as some media comment has suggested; less than 11 per cent of wheat growers reported a price reduction, on average of £4.3 per tonne. Only three per cent of barley growers deduction a problem, with on average, a price penalty of £7.3 per tonne.

1.8 The CAP Reforms - Aims and Impact

20. The implementation in 1993 of the first stage of the CAP reforms had an immediate impact. Following the introduction of compulsory set-aside, the area planted to cereals in the UK went down by 12 per cent and the production of cereals declined further by 13 per cent, because of the yield response to a lower intervention price. Furthermore the average price paid for wheat and barley declined from in excess of £120 per tonne in 1992/93 to more than £105 per tonne in 1993/94. (5.3)
21. The second stage of the CAP reforms implemented for the 1994/95 harvest year has had much less impact. As expected, when the percentage requirement for set-aside remained the same, the area planted to cereals showed only minor changes. (5.3)
22. Some further decline in the domestic price for cereals had been expected, in line with a reduction of about six per cent in the intervention price for the 1994/95 harvest year. Had market prices followed intervention prices downwards, then the average price for wheat and barley would have been less than £100 per tonne. In fact the annual price for barley in the survey was around four per cent higher, at £112 per tonne, whilst the average price for wheat increased by about two per cent, from £106 to £108 per tonne.
23. The upward trend has continued and by November 1995 the price of feed wheat, at £123 per tonne, was similar to the feed wheat price in November 1992, the year before the first stage of the CAP reform was introduced. (5.3)
24. Through a devalued green pound, the lower exchange rate of sterling for the mark and franc has resulted in an increase in the arable area and set-aside payments. This unexpected bonus, on top of higher than anticipated cereal prices, has been largely responsible for the increase in gross margin in 1994. This is in contrast to the 1993 survey when the improvement in margins was the result of lower production costs. (5.3)
25. There is a downside to the period of improving margins for cereal growers, in the form of increasing production costs. Current trends suggest that the cereal sector in the UK will be less competitive in the future than it was in 1993, when the first stage of the CAP reforms was implemented. (5.3)
26. The two factors which have had the greatest influence on the outcome of the CAP reforms in the UK have been the devaluation of the green pound and the rise in the world price of grain. Had circumstances remained similar to those prior to September 1992, the 1994 gross margin for wheat would have been approximately £691 per hectare, about 13 per cent below the average level actually recorded on the 1994 survey. Application of similar assumptions to the net margin results published in the 1993 survey report suggests that the net margin for winter wheat would have been about one third lower. (5.3)

27. Although several of the immediate objectives of the CAP reform have been achieved, this is probably more the result of the changing situation in the world supply balance than the direct effect of that reform. (5.3)

Chapter 2

Introduction

2.1 Context

When the economic survey of cereal production in the UK for the harvest year 1993 was first proposed, it was intended, like previous surveys, to be a one-year study. In May 1992, during the survey planning period, major reforms to the CAP were agreed for the 1993/94 marketing year, the same year as was to be covered by the survey. The reforms aimed to reduce the total supply of cereals, by in effect compulsorily taking land out of production, to increase the domestic consumption of grain by reducing the intervention support price, and to compensate producers for the lower prices and land left idle with support payments, paid per unit of area rather than per tonne. With the level of support payments no longer fully coupled to yield and with the prospect of lower market prices, it seemed possible that cereal growers might change their production strategy to take account of the different circumstances. In the shorter term this is most likely to involve some adjustment of material inputs, most especially fertilisers and spray chemicals. Changes to the level of fixed costs, on all but the largest enterprises, probably would need to be planned over a longer period, with the full effect of these changes not totally evident until this period elapsed. As the cereal sector was about to go through a period of substantial change, the decision was taken to extend the survey in a reduced form, to monitor the output and variable costs of the main cereal crops, wheat and barley, over the four harvests from 1994 to 1997, during which time the CAP reforms would be fully implemented. In 1998, at the end of the transition period, the plan is to mount a full survey of UK cereal production, similar to that undertaken in 1993, to give a direct comparison of the cost structure and level of returns from cereal growing before and after the reform of the CAP. As part of the monitoring process, this report presents gross margin results for wheat and barley for the 1994 harvest, the second year of CAP reform.

2.2 Methodology

The study was designed as a gross margin survey, which would record the value of output from and the cost of variable inputs to winter- and spring-sown crops of wheat and barley. The intention was to ask co-operators on the random sample of farms which had been selected for the 1993 study to continue to supply information for the extended survey. Although a belated request to extend a survey is not the best way to obtain the co-operation of farmers, nevertheless, almost three quarters of those who had taken part in the 1993 study agreed to continue to supply the required information. Replacements for farmers who left the survey were selected from randomly drawn lists.

The information required to complete the survey was collected by personal interview, with each co-operating farmer being visited, normally once after harvest. During the interview, the costs of variable inputs were recorded plus details of any

grain sales completed to that date. Information on sales made later in the season was collected, either by letter, or, more normally, by telephone. One benefit of extending the study is that co-operators have become more aware of the type of information required. This made data collection less complicated and quicker.

2.3 Structure of Cereal Production and Sampling

In Great Britain, and in the UK as a whole, cereal production has become increasingly concentrated on the larger units and into those areas where cereals are the most important enterprise in terms of area (Table 2.1). For example, in Great Britain over half of the total cereal area is on the 15 per cent of holdings growing 80 or more hectares of cereals. At the other extreme almost half of all the holdings producing cereals grow fewer than 20 hectares and account for less than 10 per cent of the total cereals area. There is a similar concentration of cereal production in the EU Eastern region of England, where almost half of the total cereal area in Great Britain is located. This concentration of production on the largest cereal enterprise is an important feature of cereal production in the UK because, as the 1993 survey showed, the larger cereal enterprises benefit from economies of size. The results of the 1994 survey confirm these findings.

Table 2.1 Cereals in Great Britain : distribution between holdings by size of cereal area

Cereal area	less than 20 ha		20 up to 80 ha		80 up to 200 ha		more than 200 ha	
	per cent total GB holdings	per cent total GB cereals	per cent total GB holdings	per cent total GB cereals	per cent total GB holdings	per cent total GB cereals	per cent total GB holdings	per cent total GB cereals
EU region - North	8.0	1.8	8.1	7.8	2.3	6.2	0.4	2.5
- East	12.4	2.7	15.0	15.0	6.7	18.7	1.8	12.8
- West	11.9	2.5	8.4	7.8	2.0	5.5	0.3	2.1
England	32.3	7.0	31.5	30.6	11.0	30.4	2.5	17.4
Scotland	9.5	1.9	6.5	6.3	1.5	4.1	0.1	0.9
Wales	4.2	0.7	0.9	0.7	0.0	0.0	0.0	0.0
Great Britain	46.0	9.6	38.9	37.6	12.5	34.5	2.6	18.3

Source: MAFF June 1994 Census data

The distribution of the sample size sought and obtained, by country, region and size group, is given in Table 2.2. Of the original sample of 400 cereal growers in Great Britain who took part in the 1993 survey, 101 farmers were unable or declined to take part in the extended survey. To replace these farms for the 1994 survey, it was necessary to contact 123 growers, 82 per cent of whom agreed to take part in the study. Of the 22 farmers who refused, half felt they were too busy to take part in a survey and a further 18 per cent were not interested. The remaining 30 per cent of

farmers contacted were not able to take part for a variety of other reasons, often personal, such as the decision to give up farming.

Table 2.2 Sample Size Sought and Obtained

Size Group	(5-<10 ha)	(10-<20 ha)	(20-<40 ha)	(40-<80 ha)	(80-<120 ha)
EU Super Region					
- North sought	6	6	7	14	10
- North obtained	3	7	7	16	10
- East sought	9	10	13	26	26
- East obtained	8	10	14	31	27
- West sought	10	9	8	13	8
- West obtained	4	11	14	15	12
England sought	25	25	28	53	44
England obtained	15	28	35	62	49
Scotland sought	2	5	9	18	12
Scotland obtained	4	4	7	15	8
Wales sought	4	7	7	7	2
Wales obtained	6	7	10	5	1

Size Group	(120-<200 ha)	(200-<300 ha)	(300+ ha)	Total
EU Super Region				
- North sought	10	4	5	62
- North obtained	13	8	4	68
- East sought	35	24	26	169
- East obtained	39	14	23	166
- West sought	10	6	5	69
- West obtained	10	9	4	79
England sought	55	34	36	300
England obtained	62	31	31	313
Scotland sought	9	3	2	60
Scotland obtained	10	5	3	56
Wales sought	2	1	0	30
Wales obtained	2	1	0	32

2.4 Weighting of Survey Results

The random sample for this survey was drawn with the intention that the number of farms selected from within a single size group, in terms of cereal area, would be proportional to the area of cereals within that size group, as recorded in the agricultural census. This distribution of the sampled farms would give the best estimate of the population mean. In practice it is difficult to achieve a final sample which matches precisely the sample sought (Table 2.2). Some farms change their cereal area groups between the time the sample is drawn and the survey undertaken. On occasion, holdings selected in a smaller size group may be part of a much larger farming business. Subsequently discarding a holding because of a change in size grouping, particularly where a farmer has agreed previously to take part in the survey, is never easy and may jeopardise co-operation in future surveys.

For the current survey, many of the size groups show small differences between the sample size sought and obtained. To correct these differences, weighting factors have been applied, to increase or decrease the importance of the sample obtained to equate more precisely with the sample sought. Where weighting factors have been applied, for example in the results by country or region, this is noted in the title.

Chapter 3

Costs and Returns of Wheat and Barley Production : 1994 Harvest Year

3.1 Presentation of Results

The survey collected separate information for the 1994 harvest year for both winter- and spring-sown crops of wheat and barley found on the sample farms. For each crop, details of variable costs and levels of output were collected to provide comparative data to the gross margin stage. Hence, in the tables of results, the gross margin is used as the main measure of profitability. In the tables which give the results for the full sample of wheat and barley growers, the mean of each variable is followed in brackets by the standard error of the mean. This statistic is used to calculate the interval above and below the sample mean within which lies the true mean of the population, from which the sample was drawn. Theory shows there is a 95 per cent probability that the observed sample mean lies within 1.96 standard errors of the true population mean. For example in Table 3.1, the average price calculated for winter wheat is £108.37, with a standard error of the mean of £0.35 per tonne. This shows that the expected average price for the whole population of winter wheat growers lies within the range of £107.68 to £109.06 per tonne. Whereas, for the much smaller sample of spring wheat growers, a mean price of £116.01, with a standard error of £2.05 per tonne, suggests an average price for the whole population of spring wheat growers within the much wider range of £111.99 to £120.03 per tonne. The estimate of price is accordingly less robust for spring wheat than for winter wheat. In other tables, where the comparisons are between smaller groups of farms taken from the main samples, analysis of variance has been used to test whether or not the means are significantly different at the ten per cent level. To avoid unnecessary repetition in the main body of the report, some tables which present the survey results by EU region have been included in Appendix A.

3.2 Gross Margin Results for Great Britain

The results of the survey of wheat and barley production in Great Britain (England, Wales and Scotland), are given in Table 3.1. To a degree, the results confirm the findings of the 1993 study. Winter wheat continues to be the cereal crop with the highest gross margin; broadly speaking, a higher yield of grain (on average up by four per cent on 1993) is sufficient to offset the increased cost of the additional material inputs required. Winter barley came second in the rankings but, with a yield increase of less than two per cent, the gross margin compares less favourably with winter wheat than in 1993. For spring wheat the overall improvement in gross margin is smaller than it could have been, due to a very low output value for straw, which in 1994 declined, against a rise for the other three crops. The very much lower value results from less of the straw crop being saved for future use, rather than straw from spring wheat being less valuable than the straw from the other

cereal crops. In general the very small sample of spring wheat units on this survey results in the averages being less robust, as can be seen from the larger standard errors of the mean.

Table 3.1 Costs and Returns for Winter and Spring Sown Crops of Wheat and Barley, Great Britain, 1994 Harvest Year (weighted)

	Winter wheat		Spring wheat		Winter barley		Spring barley	
	s.e.m.		s.e.m.		s.e.m.		s.e.m.	
No of farms	319		36		261		158	
Yield, tonnes per ha	7.75	(0.54)	6.08	(1.29)	6.24	(0.38)	5.03	(0.42)
Price, £ per tonne	108.37	(0.35)	116.01	(2.05)	108.13	(0.75)	119.61	(1.23)
	£/ha		£/ha		£/ha		£/ha	
Output - grain	839.43	(5.63)	704.89	(13.82)	675.01	(3.94)	601.80	(4.64)
Output - straw	42.26	(1.15)	11.45	(1.65)	79.98	(1.32)	81.59	(1.67)
Arable area payment	188.64	(2.66)	191.83	(7.22)	182.50	(2.05)	166.10	(2.41)
Total output	1070.33	(6.33)	908.17	(15.68)	937.50	(4.64)	849.49	(5.49)
Material costs								
Seed	53.30	(1.40)	62.92	(4.09)	49.58	(1.06)	53.07	(1.37)
Fertiliser	79.57	(1.72)	54.58	(3.86)	70.81	(1.26)	57.67	(1.44)
Crop protection	98.51	(1.93)	79.31	(4.65)	72.73	(1.30)	41.57	(1.20)
Total	231.38	(2.94)	196.81	(7.30)	193.12	(2.10)	152.31	(2.32)
Margin over materials	838.95	(5.61)	711.36	(13.88)	744.38	(4.13)	697.19	(4.97)
Other variable costs								
Casual labour	1.87	(0.27)	1.61	(0.70)	1.75	(0.19)	1.32	(0.21)
Contract	21.56	(0.78)	6.98	(1.05)	18.54	(0.61)	17.67	(0.74)
Fuel for grain drying	8.17	(0.56)	5.90	(1.27)	5.31	(0.34)	4.25	(0.39)
Miscellaneous	8.19	(0.55)	4.85	(1.12)	7.84	(0.42)	8.49	(0.53)
Total	39.79	(1.14)	19.34	(2.11)	33.44	(0.84)	31.73	(1.01)
Total variable costs	271.16	(3.15)	216.16	(7.60)	226.55	(2.26)	184.04	(2.53)
Gross margin	799.17	(5.49)	692.01	(13.72)	710.95	(4.05)	665.46	(4.87)

For spring barley, however, there are signs that an improved performance of this crop, already evident in the 1993 survey, has continued into the 1994 harvest year; this is mainly the result of a yield increase of six per cent and a slightly higher average price. The effect of this has been again to improve the gross margin for spring barley relative to the winter-sown crops. The suggestion was made in the report on the 1993 survey that spring barley is becoming a crop which is grown increasingly for malting, with a significant price premium. With the survey continuing for a further two years, it will be possible to monitor spring barley production more closely to see whether the results for this crop continue to improve relative to winter sown crops of wheat and barley.

Table 3.2 Winter Wheat : Comparison of Costs and Returns, 1993 and 1994 Harvest Years, in Money of 1994 Purchasing Power (weighted)

	1993 ⁽¹⁾ harvest current terms	1993 ⁽²⁾ harvest real terms	1994 ⁽³⁾ harvest current terms	Statistically significant differences at the 10% level	Percentage change 94 from 93 real terms
Group	0	1	2		
No of farms	297	297	319		
Yield, tonnes per ha	7.44	7.44	7.75	2>1	+4
Price, £ per tonne	105.54	107.81	108.37		+1
	£/ha	£/ha	£/ha		
Output - grain	785.03	801.89	839.43	2>1	+5
- straw	32.88	33.59	42.26	2>1	+26
Arable area payment	135.28	138.19	188.64	2>1	+37
Total output	953.19	973.67	1070.33	2>1	+10
Material costs					
Seed	51.42	52.52	53.30		+1
Fertiliser	75.20	76.81	79.57		+4
Crop protection	99.28	101.41	98.51		(-)3
Total	225.90	230.74	231.38		+0.25
Margin over materials	727.29	742.93	838.95	2>1	+13
Other variable costs					
Casual labour	1.97	2.01	1.87		(-)7
Contract	22.45	22.93	21.56		(-)6
Fuel for grain drying	10.06	10.28	8.17	1>2	(-)21
Miscellaneous	7.95	8.12	8.19		+1
Total	42.43	43.34	39.79		(-)9
Total variable costs	268.33	274.08	271.16		(-)1
Gross margin	684.86	699.59	799.17	2>1	+14

(1) 1993 results in money of 1993 purchasing power

(2) Money of 1994 purchasing power, using the Retail Prices Index

(3) 1994 results in money of 1994 purchasing power

Table 3.3 Spring Wheat : Comparison of Costs and Returns, 1993 and 1994 Harvest Years, in Money of 1994 Purchasing Power (weighted)

	1993 ⁽¹⁾ harvest current terms	1993 ⁽²⁾ harvest real terms	1994 ⁽³⁾ harvest current terms	Statistically significant differences at the 10% level	Percentage change 94 from 93 real terms
Group	0	1	2		
No of farms	45	45	36		
Yield, tonnes per ha	6.10	6.10	6.08		(-)0.3
Price, £ per tonne	109.81	112.17	116.01		+3
	£/ha	£/ha	£/ha		
Output - grain	671.86	686.29	704.89		+3
- straw	23.68	24.19	11.45		(-)11
Arable area payment	136.27	139.20	191.83	2>1	+38
Total output	831.81	849.68	908.17	2>1	+7
Material costs					
Seed	69.97	71.47	62.92		(-)14
Fertiliser	52.52	53.65	54.58		+2
Crop protection	67.89	69.35	79.31		+14
Total	190.38	194.47	196.81		+1
Margin over materials	641.43	655.21	711.36	2>1	+9
Other variable costs					
Casual labour	2.37	2.42	1.61	1>2	(-)43
Contract	21.06	21.51	6.98	1>2	(-)67
Fuel for grain drying	9.54	9.74	5.90	1>2	(-)39
Miscellaneous	5.55	5.67	4.85		(-)17
Total	38.52	39.34	19.34	1>2	(-)51
Total variable costs	228.89	233.81	216.16		(-)8
Gross margin	602.92	615.87	692.01	2>1	+12

(1) 1993 results in money of 1993 purchasing power

(2) Money of 1994 purchasing power, using the Retail Prices Index

(3) 1994 results of 1994 purchasing power

A comparison of the results for the 1993 and 1994 surveys (Tables 3.2 to 3.5) shows the gross margin for winter and spring sown crops of wheat and barley to have increased significantly in real terms in 1994. For all four crops the additional arable area payment, up by about £50 per hectare from 1993, has made an important contribution to the increase in gross margin (Table 3.6). However, for winter wheat, and more especially spring barley, the increase in output from grain and straw is a more important reason for the higher gross margins. Between 1993 and 1994 the results of the surveys show only small changes in the total cost of material inputs, although several press reports, plus anecdotal evidence from farmers taking part in the survey, suggest that the costs of fertiliser and spray chemicals have started to

increase. From the survey results, there are some signs that the cost of fertiliser is trending upwards, although not significantly so. In 1994 any increase in the charge for fertiliser has been generally offset by a reduced cost for crop protection materials. Whether this is the effect of a reduced physical input of crop protection materials rather than changes in product prices should become clearer as this series of surveys continues.

Table 3.4 Winter Barley : Comparison of Costs and Returns, 1993 and 1994 Harvest Years, in Money of 1994 Purchasing Power (weighted)

	1993 ⁽¹⁾ harvest current terms	1993 ⁽²⁾ harvest real terms	1994 ⁽³⁾ harvest current terms	Statistically significant differences at the 10% level	Percentage change 94 from 93 real terms
Group	0	1	2		
No of farms	249	249	261		
Yield, tonnes per ha	6.13	6.13	6.24		+2
Price, £ per tonne	106.69	108.98	108.13		(-1)
	£/ha	£/ha	£/ha		
Output - grain	654.12	668.17	675.01		+1
- straw	66.08	67.50	79.98	2>1	+18
Arable area payment	135.66	138.57	182.50	2>1	+32
Total output	855.86	874.24	937.50	2>1	+7
Material costs					
Seed	47.40	48.42	49.58		+2
Fertiliser	68.26	69.73	70.81		+2
Crop protection	74.65	76.25	72.73		(-5)
Total	190.31	194.40	193.12		(-1)
Margin over materials	665.55	679.84	744.38	2>1	+9
Other variable costs					
Casual labour	2.01	2.05	1.75		(-17)
Contract	22.82	23.31	18.54		(-26)
Fuel for grain drying	5.71	5.83	5.31		(-10)
Miscellaneous	8.20	8.38	7.84		(-7)
Total	38.74	39.57	33.44		(-18)
Total variable costs	229.05	233.97	226.55		(-3)
Gross margin	626.81	640.27	710.95	2>1	+11

(1) 1993 results in money of 1993 purchasing power

(2) Money of 1994 purchasing power, using the Retail Prices Index

(3) 1994 results in money of 1994 purchasing power

Table 3.5 Spring Barley : Comparison of Costs and Returns, 1993 and 1994 Harvest Years, in Money of 1994 Purchasing Power (weighted)

	1993 ⁽¹⁾ harvest current terms	1993 ⁽²⁾ harvest real terms	1994 ⁽³⁾ harvest current terms	Statistically significant differences at the 10% level	Percentage change 94 from 93 real terms
Group	0	1	2		
No of farms	242	242	158		
Yield, tonnes per ha	4.76	4.76	5.03	2>1	+6
Price, £ per tonne	112.82	115.24	119.61		+4
	£/ha	£/ha			
Output - grain	541.44	553.07	601.80	2>1	+9
- straw	70.70	72.23	81.59	2>1	+13
Arable area payment	123.24	125.89	166.10	2>1	+32
Total output	735.38	751.19	849.49	2>1	+13
Material costs					
Seed	56.48	57.69	53.07		(-9)
Fertiliser	57.40	58.63	57.67		(-2)
Crop protection	41.51	42.40	41.57		(-1)
Total	155.39	158.72	152.31		(-4)
Margin over materials	579.99	592.47	697.18	2>1	+15
Other variable costs					
Casual labour	1.43	1.46	1.32		(-13)
Contract	24.52	25.07	17.67		(-42)
Fuel for grain drying	4.94	5.05	4.25		(-19)
Miscellaneous	14.75	15.07	8.49		(-76)
Total	45.64	46.65	31.73		(-47)
Total variable costs	201.03	205.37	184.04		(-12)
Gross margin	534.35	545.82	665.46	2>1	+22

(1) 1993 results in money of 1993 purchasing power

(2) Money of 1994 purchasing power, using the Retail Prices Index

(3) 1994 results in money of 1994 purchasing power

Table 3.6 Changes in Gross Margin Components, Great Britain, 1993 to 1994 Harvest Years in Current Terms

	Winter wheat	Spring wheat	Winter barley	Spring barley
	£/ha	£/ha	£/ha	£/ha
Output - grain	+54.4	+33.0	+20.9	+60.4
- straw	+9.4	-12.2	+13.9	+10.9
Total crop output	+63.8	+20.8	+34.8	+71.3
Arable area payment	+53.4	+55.6	+46.8	+42.9
Total output	+117.2	+76.4	+81.6	+114.2
Total variable costs				
Decrease		+12.7		+17.0
Increase	(-)2.8		+2.5	
Gross margin	+£114.4	+£89.1	+£84.1	+£131.2

3.3 Gross Margin Results by Country

Comparisons of the financial results for winter wheat, winter and spring barley, regrouped by the three countries covered by the survey, are given in Tables 3.7, 3.8 and 3.9. Probably the most important change between the 1993 and 1994 harvest years has been the substantial increase in grain yield achieved by wheat and barley growers in Scotland. In a year-on-year comparison for Scotland, the average yield of spring barley increased by 12 per cent, of winter wheat by 10 per cent, and of winter barley by seven per cent. This compares with smaller, but still important, changes in England between the 1993 and 1994 harvest years where the average yield for winter wheat improved by a little over three per cent and the average yields for both winter and spring barley increased by slightly less than two per cent. In Scotland the average yield of winter wheat increased by 0.7 tonnes per hectare between 1993 and 1994. This was sufficient to reverse the national rankings of the 1993 survey, giving wheat growers in Scotland the highest gross margin in 1994 and relegating England to second place, only marginally ahead of Wales. For barley, the relative change in yields between England and Scotland has, for 1994, further improved the gross margin advantage which producers in Scotland achieved in 1993.

For cereal growers in Wales, the gross margins in 1994, for winter wheat and spring barley in particular, have improved considerably, and largely closed the performance gap between England and Wales which there was in 1993. In Wales the contribution from straw remains a more important component of output than in either England or Scotland. This is a result to be expected in a country where livestock are important and cereal (especially barley) straw is able to provide a valuable substitute for forage. In addition, an above average proportion of wheat and barley grain in Wales is retained on-farm for livestock feed.

Table 3.7 Winter Wheat : Costs and Returns by Country, 1994 Harvest Year (weighted)

	England s.e.m.		Wales s.e.m.		Scotland s.e.m.	
No of farms	273		11		35	
Yield, tonnes per ha	7.71	(0.61)	7.61	(2.89)	8.14	(1.33)
Price, £ per tonne	108.25	(0.38)	107.71	(2.46)	108.65	(0.82)
	£/ha		£/ha		£/ha	
Output - grain	834.89	(6.34)	819.29	(30.31)	884.76	(13.85)
Output - straw	36.04	(1.21)	152.08	(10.73)	70.91	(4.04)
Arable area payment	190.57	(3.01)	156.00	(13.09)	177.34	(6.19)
Total output	1061.50	(7.12)	1127.37	(34.71)	1133.00	(15.70)
Material costs						
Seed	51.99	(1.57)	56.25	(7.79)	63.60	(3.69)
Fertiliser	77.19	(1.91)	101.47	(9.76)	99.42	(4.67)
Crop protection	100.64	(2.20)	96.60	(10.65)	75.05	(4.01)
Total	229.82	(3.31)	254.32	(16.41)	238.07	(7.18)
Margin over materials	831.68	(6.31)	873.05	(30.59)	894.94	(13.96)
Other variable costs						
Casual labour	1.79	(0.30)	4.74	(1.38)	2.32	(0.72)
Contract	20.64	(0.85)	69.78	(4.17)	30.24	(2.66)
Fuel for grain drying	7.54	(0.61)	7.08	(3.24)	12.70	(1.76)
Miscellaneous	8.14	(0.62)	6.10	(2.27)	8.23	(1.39)
Total	38.12	(1.26)	87.71	(5.91)	53.50	(3.55)
Total variable costs	267.95	(3.54)	342.03	(17.44)	291.56	(8.01)
Gross margin	793.55	(6.18)	785.34	(30.01)	841.44	(13.50)

Between the 1993 and 1994 harvest years, the gross margins for winter wheat, winter and spring barley all improved. This was due mainly to an increase in total output rather than a saving in variable costs. However the reasons for the increases in output varied between countries (Table 3.10). In England, for example, the additional total output was due both to an increase in product output and a higher level of arable area payments, in generally similar proportions. Whereas, in Wales, and more especially Scotland, the improvement in gross margin was clearly due much more to the increase in product output rather than the higher level of arable area payment.

Overall cereal growers in Scotland produced some outstanding results in 1994, with yields more in line with, or better than, the most recent five-year average. This is in contrast to the results from the 1993 study where, uncharacteristically, wheat margins were lower in Scotland than England. When the results for the wheat and barley

crops for the 1993 harvest year were aggregated to give a weighted average for a combined cereal enterprise, producers in England had the highest combined gross margin and the lowest unit cost of production. For the 1994 survey the greatly improved performance of growers in Scotland has reversed this ranking (Table 3.11).

Table 3.8 Winter Barley : Costs and Returns by Country, 1994 Harvest Year (weighted)

	England s.e.m.	Wales s.e.m.	Scotland s.e.m.
No of farms	217	20	24
Yield, tonnes per ha	6.20 (0.42)	5.76 (1.03)	7.01 (1.35)
Price, £ per tonne	108.32 (0.83)	104.69 (2.53)	106.20 (2.06)
	£/ha	£/ha	£/ha
Output - grain	672.04 (4.42)	602.83 (10.53)	744.42 (13.87)
Output - straw	73.24 (1.42)	164.52 (5.01)	114.77 (5.35)
Arable area payment	187.15 (2.32)	121.87 (4.77)	173.10 (6.75)
Total output	932.43 (5.19)	889.22 (12.60)	1032.29 (16.33)
Material costs			
Seed	48.12 (1.16)	54.68 (3.15)	64.85 (4.08)
Fertiliser	67.19 (1.38)	82.16 (3.83)	98.20 (5.04)
Crop protection	74.07 (1.48)	48.87 (3.16)	68.54 (4.21)
Total	189.39 (2.34)	185.71 (5.88)	231.59 (7.73)
Margin over materials	743.04 (4.64)	703.52 (11.14)	800.71 (14.38)
Other variable costs			
Casual labour	1.49 (0.19)	6.93 (1.18)	0.86 (0.47)
Contract	17.33 (0.67)	42.21 (2.66)	17.33 (2.01)
Fuel for grain drying	4.54 (0.36)	4.09 (0.82)	14.52 (1.88)
Miscellaneous	7.53 (0.47)	13.39 (1.53)	7.81 (1.42)
Total	30.89 (0.91)	66.63 (3.39)	40.53 (3.14)
Total variable costs	220.28 (2.51)	252.33 (6.79)	272.11 (8.34)
Gross margin	712.15 (4.55)	636.89 (10.61)	760.18 (14.03)

Table 3.9 Spring Barley : Costs and Returns by Country, 1994 Harvest Year (weighted)

	England s.e.m.		Wales s.e.m.		Scotland s.e.m.	
No of farms	89		18		51	
Yield, tonnes per ha	4.95	(0.47)	5.24	(1.09)	5.42	(0.98)
Price, £ per tonne	117.87	(1.46)	103.29	(2.36)	127.10	(2.09)
	£/ha		£/ha		£/ha	
Output - grain	583.30	(5.11)	540.87	(11.15)	688.88	(11.06)
Output - straw	54.32	(1.49)	120.26	(5.23)	98.33	(4.16)
Arable area payment	184.09	(2.86)	90.44	(5.14)	172.29	(5.53)
Total output	821.71	(6.04)	751.57	(13.35)	959.50	(13.05)
Material costs						
Seed	49.85	(1.48)	52.37	(3.37)	58.06	(3.20)
Fertiliser	49.50	(1.48)	60.32	(3.88)	68.48	(3.51)
Crop protection	49.84	(1.51)	36.02	(2.96)	33.57	(2.45)
Total	149.20	(2.58)	148.71	(5.93)	160.11	(5.34)
Margin over materials	672.51	(5.47)	602.86	(11.96)	799.39	(11.90)
Other variable costs						
Casual labour	0.81	(0.17)	2.92	(0.88)	2.20	(0.63)
Contract	15.70	(0.80)	7.57	(1.01)	18.10	(1.78)
Fuel for grain drying	3.85	(0.43)	4.90	(0.99)	4.54	(0.89)
Miscellaneous	6.40	(0.53)	15.01	(1.75)	7.88	(1.13)
Total	26.76	(1.06)	30.39	(2.42)	32.72	(2.37)
Total variable costs	175.95	(2.79)	179.10	(6.40)	192.83	(5.84)
Gross margin	645.76	(5.36)	572.47	(11.71)	766.67	(11.66)

Table 3.10 Changes in Gross Margin Components, by Country, 1993 to 1994 Harvest Years, in Current Terms

	England	Wales	Scotland
	£/ha	£/ha	£/ha
Winter wheat			
Output - grain	+46.42	+66.35	+129.63
- straw	+7.74	+48.54	(-)8.39
Total crop output	+54.16	+114.89	+121.24
Arable area payment	+54.17	+68.19	+47.27
Total output	+108.33	+183.08	+168.51
Total variable costs margin - lowering			+27.02
margin - raising	(-)3.74	(-)54.15	
Gross margin	+£104.59	+£128.93	+£195.53
Winter barley			
Output - grain	+18.99	+35.96	+42.98
- straw	+12.38	+41.65	+9.29
Total crop output	+31.37	+77.61	+52.27
Arable area payment	+48.92	+38.11	+46.09
Total output	+80.29	+115.72	+98.36
Total variable costs margin - lowering	+3.81		+1.95
margin - raising		(-)0.80	
Gross margin	+£84.10	+£114.92	+£100.31
Spring barley			
Output - grain	+40.97	+104.86	+123.14
- straw	+9.87	+16.21	+9.11
Total crop output	+50.84	+121.07	+132.25
Arable area payment	+48.50	+29.47	+51.33
Total output	+99.34	+150.54	+183.58
Total variable costs margin - lowering	+5.06	+6.39	+26.61
margin - raising			
Gross margin	+£104.40	+£156.93	+£210.19

Table 3.11 Combined Wheat and Barley Enterprises : Costs and Returns, 1994 Harvest Year (weighted)

	England	Wales	Scotland
No of farms	313	32	56
Yield, tonnes per ha	6.88	5.77	6.26
Price, £ per tonne	107.45	102.01	113.45
	£/ha	£/ha	£/ha
Output - grain	739.63	588.16	710.71
Output - straw	56.42	148.39	108.17
Arable area payment	185.04	98.51	170.19
Total output	981.08	835.06	989.07
Material costs	207.66	179.90	185.74
Margin over materials	773.43	655.16	803.33
Other variable costs	44.49	63.60	52.26
Total variable costs	252.15	243.50	238.00
Gross margin	728.93	591.56	751.07

Table 3.12 Arable Area Payments for Cereals 1993 and 1994 Harvest Years

Country	Area Payment £ per hectare	
	1993	1994
England	140.64	193.53
Scotland (LFA)	114.07	156.97
Scotland (non-LFA)	131.39	180.51
Wales (LFA)	110.28	108.35
Wales (non-LFA)	110.28	168.72

Table 3.13 Costs and Returns, Combined Wheat and Barley Enterprises, by Size Group (1), 1994 Harvest Year, Intensive Counties of England(2)

	(<40 ha)	(40-<80 ha)	(80-<120 ha)	(120-<200 ha)	(200+ ha)
No farms	29	27	29	36	38
Yield, tonnes per ha	6.16	7.08	7.21	7.36	7.43
Price, £ per tonne	105.09	108.46	111.42	110.39	111.39
	£/ha	£/ha	£/ha	£/ha	£/ha
Output - grain	643.81	767.86	801.34	811.35	822.95
- straw	41.54	37.83	24.68	28.11	19.49
Arable area payment	175.08	188.87	192.95	191.64	188.22
Total output	860.43	994.56	1018.97	1031.10	1030.66
Material costs	186.10	212.55	220.47	221.58	229.06
Margin over materials	674.33	782.02	798.51	809.52	801.61
Casual labour	0.74	1.97	3.96	0.79	1.34
Contract	52.86	13.39	14.46	7.46	2.29
Fuel for grain drying	2.46	5.51	7.64	6.40	6.52
Miscellaneous	5.23	8.01	6.14	8.68	7.04
Total variable costs	247.39	241.43	252.67	244.92	246.24
Gross margin	613.04	753.14	766.30	786.18	784.42
Contract	52.86	13.39	14.46	7.46	2.29
Gross margin before contract	665.90	766.53	780.77	793.65	782.13
Variable costs £ per tonne	40.16	34.10	35.04	33.28	33.14

(1) Based on the total area of cereals plus set-aside

(2) Counties with more than 40 per cent of cereals in the crops and grass area, as listed in Appendix B

Although the increase in product output was the more important reason for the improved gross margins in Scotland and Wales, the arable area payment is making an increasing contribution to total output. Between the 1993 and 1994 harvest years the arable area payment increased, except in the less favoured areas of Wales, by about £50 per hectare (Table 3.12). In the 1994 harvest year, the payment accounted for almost 18 per cent of total output for winter wheat and nearly 20 per cent for spring barley; this compares with 14 and 17 per cent for winter wheat and spring barley in 1993. The increase in arable area payments has coincided with a period when UK

grain prices have remained high, indeed above intervention levels, and clearly higher than those envisaged when the reforms to the CAP were first introduced. The impact which the changing value of the pound can have on the profitability of cereal production is considered in greater detail in Chapter 5.

Table 3.14 Costs and Returns, Combined Wheat and Barley Enterprises, by Size Group(1), 1994 Harvest Year, Extensive Counties of England(2)

	(<40 ha)	(40-<80 ha)	(80-<120 ha)	(120-<200 ha)	(200+ ha)
No farms	49	35	20	26	23
Yield, tonnes per ha	5.78	6.64	7.32	7.09	7.68
Price, £ per tonne	101.95	105.45	106.85	108.72	110.63
	£/ha	£/ha	£/ha	£/ha	£/ha
Output - grain	588.95	699.01	781.54	771.72	851.39
- straw	107.02	73.18	70.26	64.07	40.47
Arable area payment	166.82	188.19	189.65	193.55	193.24
Total output	862.80	960.38	1041.44	1029.35	1085.10
Material costs	182.92	199.28	205.37	214.16	219.65
Margin over materials	679.88	761.10	836.07	815.19	865.46
Casual labour	1.25	0.54	1.02	2.68	2.46
Contract	52.17	55.46	30.61	12.40	16.76
Fuel for grain drying	2.47	5.73	6.75	6.21	8.36
Miscellaneous	10.93	6.17	11.60	7.99	7.73
Total variable costs	249.74	267.18	255.35	243.45	254.95
Gross margin	613.07	693.20	786.09	785.90	830.16
Contract	52.17	55.46	30.61	12.40	16.76
Gross margin before contract	665.24	748.66	816.70	798.30	846.92
Variable costs £ per tonne	43.21	40.24	34.88	34.34	33.20

(1) Based on the total area of cereals plus set-aside

(2) Counties with less than 40 per cent of cereals in the crops and grass area, as listed in Appendix B.

Table 3.15 Proportions of Wheat and Barley in the Cereal Area, by Size Group, 1994 Harvest Year. A. Intensive Counties of England (1)

Size group	(<40 ha)	(40-<80 ha)	(80-<120 ha)	(120-<200 ha)	(200+ ha)
No farms	29	27	29	36	38
Proportions of:	per cent	per cent	per cent	per cent	per cent
Winter wheat	53.9	71.5	62.6	71.3	77.2
Winter barley	14.7	22.6	21.5	20.0	16.2
Winter sown sub-total	68.6	94.1	84.1	91.3	93.4
Spring wheat	12.7	1.3	8.3	1.9	1.0
Spring barley	13.4	3.7	4.5	4.9	3.7
Spring sown sub-total	26.1	5.0	12.8	6.8	4.7
Other cereals	5.3	0.9	3.1	1.9	1.9
	100.0	100.0	100.0	100.0	100.0

B. Extensive Counties of England (2)

Size group	(<40 ha)	(40-<80 ha)	(80-<120 ha)	(120-<200 ha)	(200+ ha)
No farms	49	35	20	26	23
Proportions of:	per cent	per cent	per cent	per cent	per cent
Winter wheat	29.6	60.0	64.0	67.6	73.4
Winter barley	45.0	25.9	20.6	26.2	15.8
Winter sown sub-total	74.6	85.9	84.6	93.8	89.2
Spring wheat	0.6	1.4	3.0	0.6	4.5
Spring barley	17.7	10.1	3.3	3.0	2.4
Spring sown sub-total	18.3	11.5	6.3	3.6	6.9
Other cereals	7.1	2.6	9.1	2.6	3.9
	100.0	100.0	100.0	100.0	100.0

(1) Counties with more than 40 per cent cereals in the crops and grass area, as listed in Appendix B.

(2) Counties with less than 40 per cent cereals in the crops and grass area, as listed in Appendix B.

Table 3.16 Fertiliser Usage for Winter Wheat Units, by Size Group, 1994 Harvest Year, Intensive Counties of England(1)

Size Group	(<40 ha)	(40-<80 ha)	(80-<120 ha)	(120-<200 ha)	(200+ ha)
No farms	19	27	26	36	38
Yield, tonnes per ha	7.42	7.53	7.79	7.75	7.86
Fertiliser applied - kg per ha					
Nitrogen	177.3	179.8	200.6	207.2	208.6
Phosphate	32.2	47.8	47.1	49.4	52.8
Potash	40.3	51.8	48.9	42.1	42.9
Total	659.8	740.0	734.7	704.3	798.0
Cost £ per tonne	102.8	104.0	97.9	98.5	89.9
Cost £ per ha	67.9	76.3	71.9	70.5	70.2

(1) Counties with more than 40 per cent of cereals in the crops and grass area, as listed in Appendix B.

3.4 Gross Margin Results by Size of Enterprise

The report on the 1993 survey concluded that economies of size do exist in cereal production, and in particular showed savings in the cost of labour and machinery as the size of the cereal unit became larger. In other areas it is commonly accepted that there are economies of size but these may be less easy to demonstrate. On occasion, differences which appear to be between size groups may be the effect of factors not related to the area of cereals, for example a different size distribution and pattern of farming between regions. To reduce the possible effect of regional variation the main analysis by size of cereal unit has been confined to those counties in England where cereals account for more than 40 per cent of the crops and grass area (Table 3.13). A second analysis of the sample farms in the remaining counties in England, where cereal production accounts for less than 40 per cent of the crops and grass area, is given in Table 3.14. For both analyses the four crops included in the survey are combined to give a weighted average for a wheat and barley enterprise and re-aggregated by size.

A comparison of the results for the two regions shows only small differences in the level of input costs or of gross margin; however the composition total output shows an important difference in the value of straw. In the extensive region the value of straw accounts for between four per cent of total output on the largest units, and increases to twelve per cent on the smallest units; this compares with a range of from less than two to five per cent in the cereal intensive counties of England. A second important difference is that the less than 40 hectare units in the extensive group are generally mixed farms mainly growing barley, whereas the same size group in the intensive counties have a wheat to barley ratio which is similar to the larger size groups. Overall the sample farms in the extensive cereal counties have produced results at least as good, if not better, as the farms in the main cereal growing counties in

England. The question of the merits of growing cereals intensively or as part of a wider rotation on mixed farms will be considered in the report on the 1995 survey.

In the comparison given in Table 3.13 it is apparent that there are economic benefits as the size of enterprise increases. The average yield of cereal tends to increase with size and, with some improvement in price, the value of grain output increases in the same direction. An important reason for the improvement in yield is the increasing proportion of winter wheat, the highest yielding cereal, in the combined enterprise (Table 3.15). A consequence of increasing the proportion of winter wheat in the cereal blend is some addition to the cost of material inputs, because more are required to grow winter wheat than other cereals. However, when measured on a per tonne basis, the cost of material inputs shows only very small differences between the size groups. In addition any increase in material input cost is balanced by the reduction in other variable costs, because the charge for contracting becomes less as the enterprise gets larger. So overall there is very little difference in total variable costs between the five size groups.

One reason for the smaller than expected change in the cost of material inputs is the stronger bargaining power of the larger farm business. An example of this is given in Table 3.16, where the average fertiliser use and expenditure are given by size group for winter wheat enterprises in the intensive counties of England. As can be seen, the total quantity of fertiliser applied increases substantially as the wheat enterprise gets larger, but despite this there are relatively small differences in the per hectare cost for fertiliser between the small and large wheat enterprises. This demonstrates the buying power of the large producers who were able in the survey year to purchase fertilisers of similar quality at a price 14 per cent below that paid by the smallest producers. It is probable that a similar purchasing advantage applies to spray chemicals; however because of the wide variation in the types of sprays used it was not practicable to measure physical inputs.

3.5 Dispersion in Gross Margin

On average, the gross margins estimated for the 1994 harvest year are higher than those recorded on the 1993 survey. However, as is usual with economic studies of farming enterprises, the survey average is derived from a wide range of individual farm results. Examples of these ranges are given in Tables 3.17, 3.18 and 3.19 where, based on the margin over materials, the results for the upper twenty-five per cent of producers of winter wheat, winter and spring barley are compared with the results of growers in the lower quarter. The reasons for the difference in gross margin are of particular interest. For all three crops, the level of total output and its components, including somewhat surprisingly the value of output from straw, are all significantly higher in the upper quarter farms. The single most important factor influencing the level of output is the yield of grain, which was from 42 to 52 per cent higher on the upper quarter farms. A second important factor in determining the level of output is the price per tonne, with the between group differences being especially important for the barley, and particularly spring barley, enterprises. In contrast, the cost of material inputs are not significantly different for any of the three crops included in the comparison; in respect of winter wheat and spring barley it is only a higher charge for contracting which causes the total variable costs to be marginally higher on the lower

quarter farms. Part of this is the effect of size, since the lower quarter farms are on average smaller units. Overall the differences, mainly in output but also in costs, were such that the gross margins for the upper twenty-five per cent farms ranged between crops from about 60 to over 100 per cent higher than the margins for the lower quarter group.

Table 3.17 Winter Wheat Units : Costs and Returns, per Hectare by Margin over Materials Quartiles, 1994 Harvest Year

Group	1		2		Statistically significant differences at the 10% level
	Upper 25%	s.e.m.	Lower 25%	s.e.m.	
No of farms	79		79		
Crop area (ha)	88.9	(9.73)	58.6	(7.33)	1>2
Yield, tonnes per ha	8.82	(0.10)	6.19	(0.12)	1>2
Price, £ per tonne	110.70	(0.93)	105.97	(0.70)	1>2
	£/ha		£/ha		
Output - grain	971.95	(9.88)	655.06	(12.23)	1>2
- straw	73.64	(7.95)	41.78	(5.18)	1>2
Arable area payment	189.54	(0.95)	183.16	(3.29)	1>2
Total Output	1235.13	(8.35)	880.00	(10.59)	1>2
Materials costs					
Seed	55.49	(1.58)	54.72	(1.35)	
Fertiliser	80.40	(2.23)	80.53	(2.10)	
Crop protection	96.48	(3.01)	94.78	(3.94)	
Total	232.38	(4.19)	230.03	(5.09)	
Margin over materials	1002.76	(7.73)	649.97	(9.05)	1>2
Other variable costs					
Casual labour	1.41	(0.39)	1.34	(0.44)	
Contract	15.22	(3.77)	37.75	(6.41)	2>1
Fuel for grain drying	9.62	(0.96)	5.45	(0.85)	1>2
Miscellaneous	8.89	(0.98)	7.34	(0.72)	
Total	35.14	(3.97)	51.89	(6.39)	2>1
Total variable costs	267.52	(5.21)	281.92	(8.09)	
Gross Margin	967.61	(8.26)	598.09	(10.73)	1>2

Table 3.18 Winter Barley Units : Costs and Returns, per Hectare by Margin over Materials Quartiles, 1994 Harvest Year

Group	1		2		Statistically significant differences at the 10% level
	Upper 25%	s.e.m.	Lower 25%	s.e.m.	
No of farms	65		65		
Crop area (ha)	31.3	(3.56)	20.0	(2.52)	1>2
Yield, tonnes per ha	7.21	(0.12)	4.90	(0.14)	1>2
Price, £ per tonne	111.17	(1.84)	103.59	(1.05)	1>2
	£/ha		£/ha		
Output - grain	796.84	(15.31)	505.64	(14.10)	1>2
- straw	118.67	(8.03)	57.49	(5.97)	1>2
Arable area payment	186.68	(2.04)	153.24	(8.63)	1>2
Total Output	1102.19	(12.84)	716.37	(16.99)	1>2
Materials costs					
Seed	53.41	(2.19)	51.19	(1.79)	
Fertiliser	70.03	(2.20)	68.65	(5.12)	
Crop protection	71.54	(3.50)	66.43	(3.77)	
Total	194.98	(4.92)	186.28	(7.19)	
Margin over materials	907.21	(10.45)	530.09	(15.47)	1>2
Other variable costs					
Casual labour	1.53	(0.54)	2.65	(0.84)	2>1
Contract	23.33	(7.08)	34.22	(6.16)	2>1
Fuel for grain drying	6.62	(1.99)	3.90	(0.89)	
Miscellaneous	7.57	(0.89)	7.17	(0.92)	
Total	39.05	(7.23)	47.95	(6.67)	
Total variable costs	234.03	(9.61)	234.23	(9.84)	
Gross Margin	868.16	(12.58)	482.14	(16.13)	1>2

Table 3.19 Spring Barley Units : Costs and Returns, per Hectare by Margin over Materials, 1994 Harvest Year

Group	1 Upper 25%	s.e.m.	2 Lower 25%	s.e.m.	Statistically significant differences at the 10% level
No of farms	39		39		
Crop area (ha)	44.7	(9.56)	13.0	(2.10)	1>2
Yield, tonnes per ha	6.14	(0.11)	4.03	(0.21)	1>2
Price, £ per tonne	128.41	(2.79)	104.80	(1.32)	1>2
Output - grain	£/ha 785.39	(20.46)	£/ha 419.68	(20.96)	1>2
- straw	106.80	(7.89)	67.96	(5.86)	1>2
Arable area payment	182.16	(1.85)	141.27	(11.23)	1>2
Total Output	1074.34	(19.45)	628.91	(18.31)	1>2
Materials costs					
Seed	57.25	(2.29)	55.78	(2.51)	
Fertiliser	61.60	(3.75)	58.13	(3.49)	
Crop protection	42.07	(2.62)	41.21	(3.60)	
Total	160.92	(5.43)	155.11	(5.96)	
Margin over materials	913.42	(17.81)	473.79	(16.68)	1>2
Other variable costs					
Casual labour	1.56	(0.57)	2.66	(1.12)	
Contract	13.13	(3.35)	41.50	(10.15)	2>1
Fuel for grain drying	3.52	(1.04)	3.59	(1.37)	
Miscellaneous	8.22	(1.11)	8.11	(1.91)	
Total	26.44	(3.40)	55.86	(9.94)	2>1
Total variable costs	187.36	(5.59)	210.98	(12.93)	
Gross Margin	886.98	(18.87)	417.93	(17.85)	1>2

The wide dispersion in gross margins raises several important issues. With the cost of seed, fertiliser and spray chemicals not significantly different, it would seem reasonable to assume that, in an average situation, cereal growers in the upper and lower quarter groups aim to grow similar yields of wheat or barley; yet the survey results show producers in the upper twenty-five per cent to have a yield advantage of almost 50 per cent over farms in the lower quarter group. This must in part be a result of management. The higher yielding farms are on average larger and it may be that better managers are able to gain control of more resources. There are likely to be other factors, largely beyond the control of the farmer, which affect the final yield of a cereal crop, the interaction between weather and land quality being the most

obvious example. If these factors beyond the control of farmers do significantly affect yield and so have the effect of changing the quartile ranking of a particular farm, then the comparison of upper and lower quarter groups becomes less meaningful. Inevitably this type of comparison infers that farms in the upper quarter group are the better cereal growers, whereas to a degree this may be a chance effect.

3.6 Dispersion in Yield

To date, the survey has collected average yields for wheat and barley over a three year period; these were farmer estimates for the 1992 harvest year and actual yields in 1993 and 1994. This has made it possible first to rank a sample of 231 farms by wheat yield quartiles for each of the three years, with the wheat units arrayed in ascending order of yield into four quarters from 1 to 4, and then to identify the movement between quartiles for individual farms between 1992 and 1994. The results of this analysis are given in Table 3.20. To give an example of how this table works, 30 per cent of the farms which were in the lowest quarter for wheat yield in 1992, remained in this group over the whole three year period. A further 32 per cent moved up to quartile 2 for at least one year between 1992 and 1994, and the remaining farms moved to quartile 3 and 4 during the three year period. The most extreme changes in ranking came from just under 12 per cent of the farms which moved from the lower to the upper wheat yield quartile between 1992 and 1994. At the opposite end of the spectrum a similar number of farms went from the upper to the lower wheat yield quartile during the same period. However, the table does show also a considerable degree of consistency in wheat yield since over 60 per cent of the farms which were in the lower yield quartile in 1992 produced below average yields in each of the three years. At the other extreme, two thirds of the farms which started in the upper yield quartile in 1992, continued to produce above average yields in 1993 and 1994. As this survey is planned to continue until the 1997 harvest year, a more detailed investigation of yield variation will be possible, as further survey data become available.

Table 3.20 Proportion of Sample Farms Changing from the 1992 Wheat Yield Quartiles in 1993 and 1994

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Proportion of farms which				
Remained in same quartile	30.0	23.2	23.9	37.5
Moved one quartile	31.6	51.8	47.7	29.2
Moved two quartiles	26.7	25.0	28.4	20.8
Moved three quartiles	11.7	-	-	12.5
	100.0	100.0	100.0	100.0

Chapter 4

Marketing and Disposal of Wheat and Barley

4.1 Introduction

In the eight year period between 1985 and 1993, the annual average price for wheat and barley, in current terms, was generally on an upward trend. This was most noticeable between 1989 and 1992 when, for example, the price of wheat increased by about £15 per tonne. Following the introduction of the first stage of the CAP reform in 1993, which included a lowering of the intervention price, cereal prices declined sharply, by about £18 per tonne. In just one year, this reduction was sufficient to cancel out the price rises of the previous seven years and to give an annual average price in 1993 which was, in current terms, below the levels recorded on the 1985 survey. In real terms, between 1985 and 1993, prices had declined by 37 per cent. For the 1994 harvest year, the second stage of the reform again included a reduction in the intervention price, aimed at further driving down domestic prices for wheat and barley. There was an increase in the level of arable area payments in anticipation of this effect. In fact, because of the strength of the world market, the second stage of the reform has not reduced further the domestic market prices for wheat and barley; these remained similar to the level recorded in the 1993 harvest year, and generally well above the 1994/95 intervention price for barley of £99 per tonne (Figure 4.1).

4.2 Prices Received

In Table 4.1, the survey results have been analysed to show grain disposals by outlet, quality and price. Sales of wheat for milling and barley for malting earned premiums ranging from 11 to 22 per cent above the price paid for grain intended for incorporation in livestock feed. Winter and spring wheat sold for milling received the smallest premiums, on average 11 and 12 per cent; these were substantially less than the premiums paid for winter and spring sown crops of malting barley, at 17 and 22 per cent.

Given the much larger volume of wheat produced in the UK, the lower premiums offered for grain of milling quality may be sufficiently attractive to encourage wheat growers to produce the quantity of home-grown wheat of suitable quality which the millers need. However the survey estimates show that only about 20 per cent of the wheat on the sample farms was reported as being sold for milling, which from a 13.3 million tonne wheat crop would equate to about 2.7 million tonnes sold for milling. This may be compared with around 4.5 million tonnes which, according to official statistics, goes for human and industrial usage. It appears that much wheat believed to have been sold as feed wheat was eventually used for milling.

For the barleys the premium situation was in marked contrast. The premiums for malting barley have increased from about ten per cent in 1985, to 14 per cent in 1993, and to around 20 per cent for the 1994 survey. Comparison of barley prices published by the Home-Grown Cereals Authority suggest that the increased premiums for malting barley have continued following the 1995 harvest. It is evident that the premiums paid for barley of malting quality are having an impact. In a situation where

Figure 4.1 Average Price of Wheat and Barley in the UK, 1985-1994 Harvest Years



¹ Before deduction of co-responsibility levy 1985/86 - 1991/92

Source: MAFF; Home Grown Cereals Authority

the total volume of barley produced in the UK continues to decline, maltsters have been able largely to maintain their supplies and so effectively increase their share of the reduced total barley crop which is now available. A comparison of the results from

Table 4.1 Disposal of Grain by Quality, Proportion and Price, 1994 Harvest Year Weighted

	Winter wheat		Spring wheat	
	per cent	£/tonne	per cent	£/tonne
Milling	19.0	116.63	49.2	117.9
Malting	-	-	-	-
Seed	3.3	120.32	6.1	140.72
Feed	64.9	104.97	32.0	105.00
Total sales	87.2	108.14	87.3	112.10
	per cent	valuation £/tonne	per cent	valuation £/tonne
Unsold @ 31.5.95	7.2	116.75	8.4	127.46
Proportion retained for:				
seed	0.7	109.68	-	-
feed	4.9	104.45	4.5	105.1
Total retentions	5.6	109.88	4.5	105.1

	Winter barley		Spring barley	
	per cent	£/tonne	per cent	£/tonne
Milling	-	-	-	-
Malting	22.8	120.16	48.2	125.93
Seed	4.8	123.52	6.1	144.73
Feed	39.2	102.45	14.2	103.51
Total sales	66.8	109.37	68.5	121.65
	per cent	valuation £/tonne	per cent	valuation £/tonne
Unsold @ 31.5.95	3.7	109.36	2.4	107.27
Proportion retained for:				
seed	0.6	112.04	0.6	124.16
feed	28.9	102.63	28.1	101.20
Total retentions	29.5	104.71	28.7	106.68

the 1985 and 1994 surveys confirm the importance of this change. In 1985, almost 54 per cent of spring barley sales were for incorporation in livestock feed and only 42 per cent of sales for malting. By 1994, the survey results showed a marked change

with only 24 per cent of barley sales destined for livestock feed compared with 66 per cent of all sales going for malting. These results from the 1994 survey confirm the findings of the 1993 study which first suggested that spring barley production was becoming increasingly specialised by outlet.

Table 4.2 Range of Prices for Grain Sales, 1994 Harvest Year

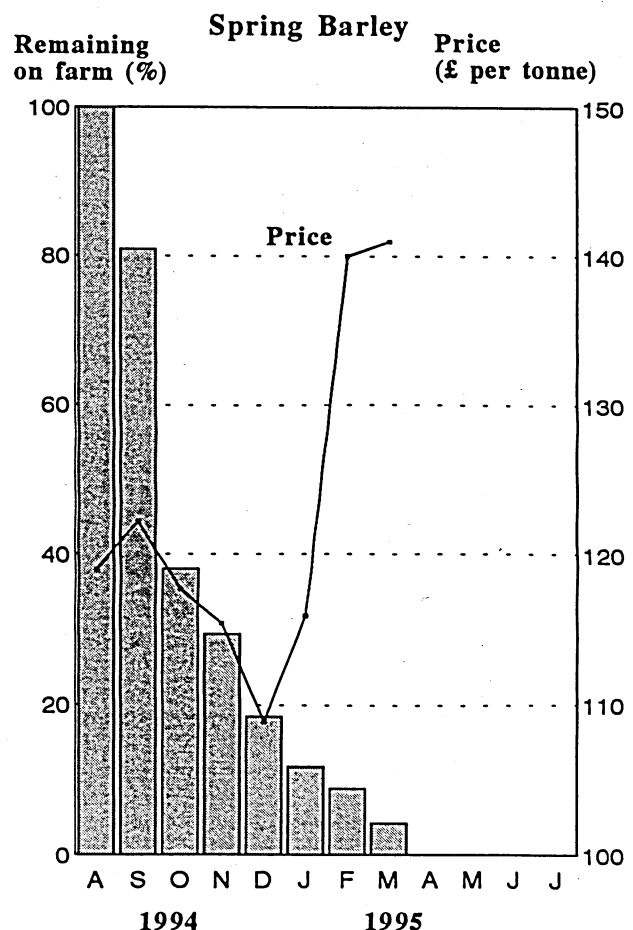
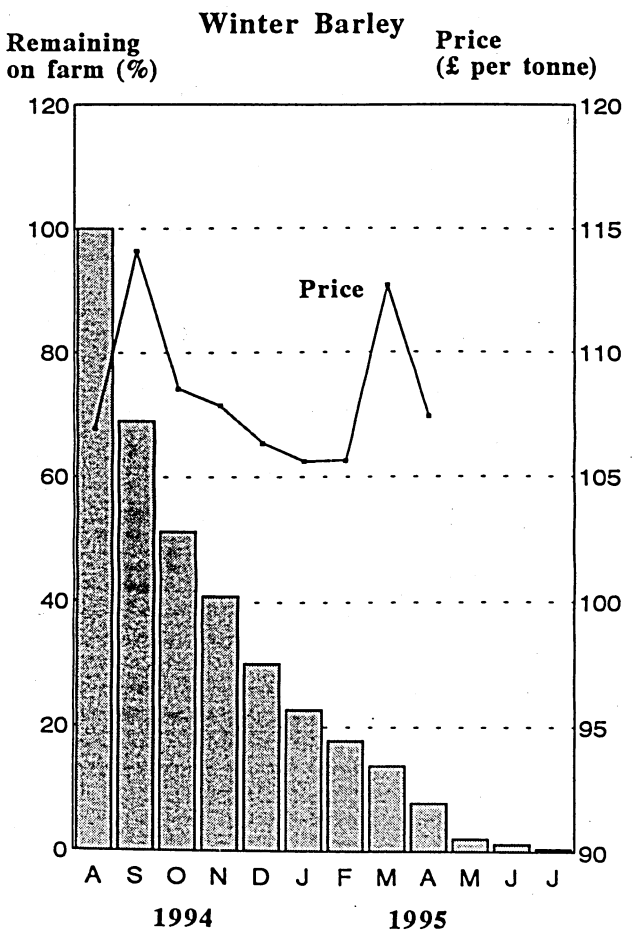
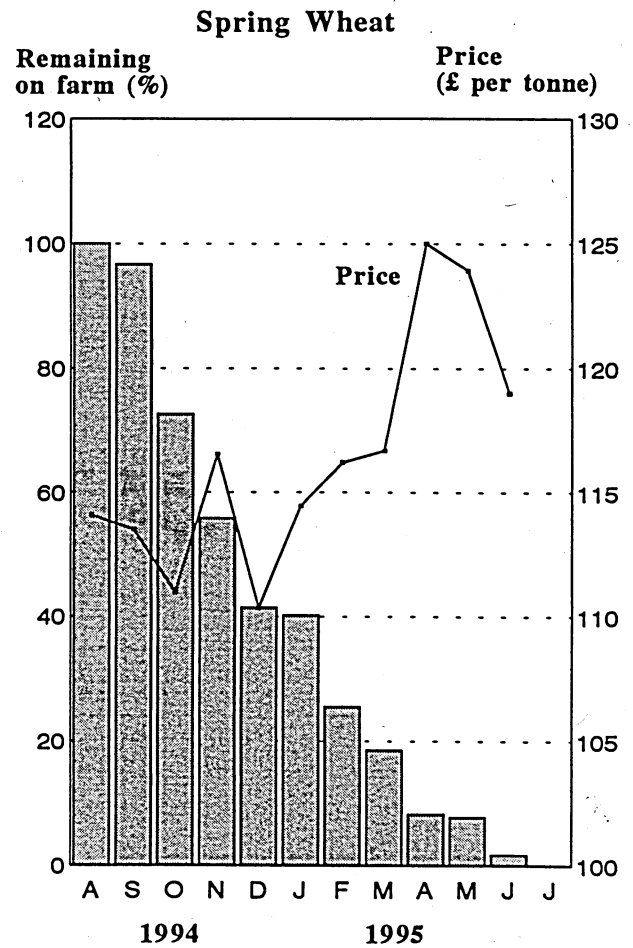
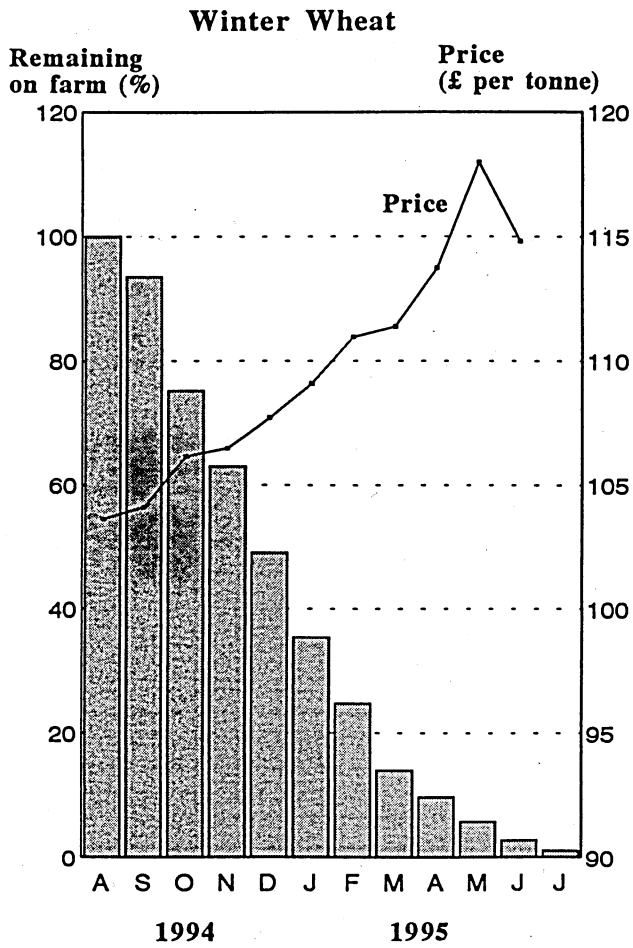
		Weighted Average £/tonne	Minimum £/tonne		Maximum £/tonne	
Winter wheat						
Grain sold for:	milling	116.63	92.97	(103.52) ¹	157.58	(128.63) ²
	seed	120.32	105.97	(106.55)	215.08	(194.06)
	feed	104.97	82.93	(95.93)	121.50	(110.32)
Spring wheat						
Grain sold for:	milling	117.90	110.50		128.63	
	seed	140.72	133.66		154.97	
	feed	105.00	95.89		130.00	
Winter barley						
Grain sold for:	malting	120.16	101.50	(104.97)	150.03	(140.10)
	seed	123.52	105.00		166.17	
	feed	102.45	84.91	(91.99)	124.73	(110.00)
Spring barley						
Grain sold for:	malting	125.93	97.58	(104.85)	163.00	(145.47)
	seed	144.73	125.00		184.34	
	feed	103.51	90.00	(92.14)	115.00	(114.79)

(1) The figures in parentheses exclude the bottom five per cent of sales

(2) Excluding the top five per cent of sales.

On average, sales of wheat and barley for milling, malting, or for seed attracted a premium over the price paid for grain intended for incorporation in livestock feed. At the margin a premium may be more difficult to identify where the wide range in prices for different qualities of grain can result in a price overlap. For example in Table 4.2 the minimum price paid for milling wheat is substantially less than the average price paid for feeding wheat; a similar but less extreme situation occurs with spring barley sold for malting or for feed. However the price overlap tends to be exaggerated by a relatively small number of readings, often for small tonnages of grain, which occur at the upper and lower ends of the price range. For example when the upper and lower five per cent of prices are excluded from the analysis (see the figures in parentheses in Table 4.2) the range relates much more closely to the mean, with the minimum prices paid for milling wheat or malting barley similar to, or better than the average price paid for feed grain. Because of an insufficient number of readings it was not practicable to include spring wheat or barleys sold for seed in the additional price range analysis.

Figure 4.2 Monthly Proportion of Grain Remaining on-farm with Monthly Average Prices



On the day, a premium for milling wheat or malting barley will be relatively easy to identify; it is more difficult to establish in the longer-term when the average monthly prices change substantially over the course of the marketing season. During the 1994/95 marketing year the average monthly price for wheat increased by £14 per tonne, from £104 per tonne in September to £118 per tonne by the following May (Figure 4.2). In these circumstances the premium price paid for milling wheat early in the season may well be overtaken by the price for feeding wheat later in the season when the market reacts to a tightening supply situation. The apparent failure to attract a premium over feed grain can occur more frequently where the average monthly price changes are more volatile, as happened with winter and spring barley during the 1994/95 season.

There is a further complication which can, on occasion, make it more difficult to identify the premiums paid for quality grain. This is where part of a consignment of grain sold on the farm at an agreed premium price fails to meet the required quality specification when delivered to the end-user and, as a result, incurs a price penalty. This will have the effect of reducing the average price paid for the whole consignment and making any premium less obvious. Whereas, in fact the consignment included two categories of grain, one with an identifiable premium, the other with a much smaller or nil premium. The 1993 cereal survey identified isolated instances where, because of deductions, the price paid for milling wheat was less than the equivalent price for feeding wheat. To consider the potential problems with price penalties, the 1994 survey included a section to record details of price deductions, made at the point of delivery which were not anticipated when the grain left the farm. This type of price penalty is described as a non-negotiated price reduction. This is in contrast to a negotiated price deduction which, arising from a sliding scale of payments, takes account of slight changes from an agreed specification.

The results of this analysis suggest that non-negotiated price deductions were not very common. Less than 11 per cent of wheat growers reported any instance of this type of price reduction; on average the deduction was £4.29 and ranged from ten pence to £16 per tonne. Of barley growers, only three per cent reported problems, although the deductions affected almost three quarters of the total sales of these sample farms. On average, the price penalty for barley was £7.29 and ranged from £1 to £30 per tonne. Surprisingly a too high moisture content was the main reason for price deductions with wheat, closely followed by a protein content which was below the required level. For barley more credibly, a too high nitrogen content was the main reason for price penalties. One sector of the market where a premium was more easily identifiable and deductions did not occur was with wheat and barley sold for seed. In all cases the minimum price paid for seed was in excess of the average price paid for feed grain.

Although this analysis suggests that non-negotiated price deductions do not occur very often, the results show a degree of regional bias. Out of a total of 324 wheat growers, only 35 reported an unexpected price reduction on part of their wheat sales. However a disproportionate number of these farms, 43 per cent, are located in the Eastern region, a part of the country which has only one quarter of the total sample of wheat growers. From the information collected on the survey, it is not possible to

explain why a disproportionate number of such price deductions should occur in one of the main wheat growing areas in the UK.

Chapter 5

The CAP Reforms - Aims and Impact

5.1 The Pre-Reform Period

During the decade which preceded the introduction and implementation of the CAP reform of 1992, the production and consumption of cereals became increasingly out of balance in the European Union. The effect of a substantial increase in production during a period when consumption was at best static led to growing surpluses of grain which needed to be held in intervention stores or subsidised into export on to the world market; both options meant an increasing burden for the taxpayer. The EU policy of subsidising grain exports has become a bone of contention with the other major producers and exporters of cereals outside Europe. This situation needs to be modified if the EU is to satisfy the requirements of the GATT agreement to reduce both the volume of and expenditure on subsidised cereal export. Within the EU, the practice of maintaining domestic grain prices above the levels at which alternative supplies could be imported has distorted the home market for wheat and barley. Whilst a policy of maintaining domestic prices at artificially high levels has encouraged the over-production of wheat in particular, it has at the same time depressed consumption, especially by encouraging the importing of less costly cereal substitutes to replace home produced grain in livestock rations.

5.2 The Aim of the Reforms

Faced with several inter-related problems, the Commission designed a package of reforms to be implemented over a four year period, the first stage of which was introduced in 1993. For the cereal sector the main purpose of the reforms was to reduce the surplus of grain production over consumption. The strategy adopted by the Commission to achieve this objective was firstly to lower the domestic price by reducing (or in the case of feed wheat totally removing) the intervention price, and secondly to take a proportion of the total cereal area out of production. The intention was that the reforms should take effect in several ways. A reduction in the domestic price would make cereals less financially attractive to grow and, equally importantly, increase the consumption of home-grown grain at the expense of (mainly imported) cereal substitutes. To compensate growers for a reduced return from the market, the reforms included an annual payment based on the area rather than the tonnage of cereals grown. This partial decoupling of producer subsidies allowed the expenditure to be taken out of the purview of the GATT agreement. The area payment would be conditional on idling a proportion of the total cereal, protein and oilseeds area (15 per cent in 1993 and 1994) which would have a more immediate effect on reducing production. These Commission proposals were in their essence adopted by the Council of Ministers.

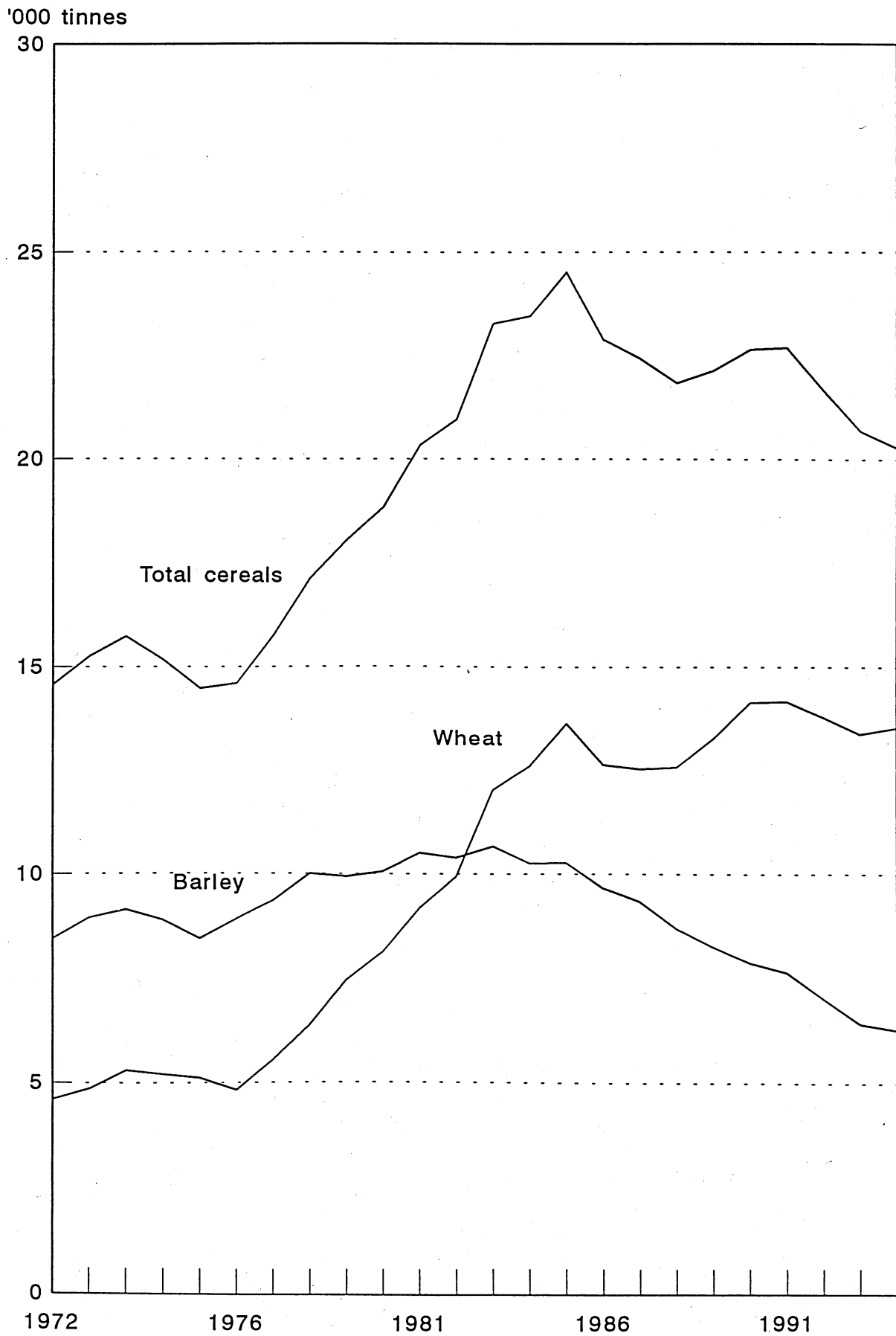
5.3 The Impact of the Reforms in the UK

After the UK joined the EU, the total volume of British cereals produced expanded rapidly, mainly as a result of a substantial increase in wheat production, and reached a peak of around 25 million tonnes in 1984 (Figure 5.1). Since that time the total quantity of cereals produced in the UK has tended to decline, as the tonnage of wheat grown reached a plateau and the production of barley decreased to a level below that of 1972. The implementation in 1993 of the first stage of the CAP reforms continued this downward trend when, following the introduction of compulsory set-aside, the area planted to cereals in the UK went down by 12 per cent and the production of cereals declined by 13 per cent. In other areas the reforms had a similar immediate impact when, in response to a lower intervention price, the average price paid for wheat and barley declined from over £120 per tonne in 1992/93 to little more than £105 per tonne in 1993/94 (Figure 4.1).

The second stage of the CAP reforms, which was implemented for the 1994/95 harvest year, has had much less impact. This was to be expected in so far as set-aside had an immediate large effect on the total cereal area in the first year but would have little further impact, unless the percentage requirement for set-aside had been subsequently adjusted. On the other hand some further decline in the domestic price for cereals was expected, generally in line with a reduction of about six per cent in the intervention price for the 1994/95 harvest year. In a situation where cereal production exceeds consumption and the disposal of surpluses outside the EU is limited by the availability of export subsidies, intervention provides a floor to the market. The domestic ex-farm price for wheat and barley is in this circumstance about seven per cent below the intervention price. This reflects both the haulage costs incurred when moving grain from farm to wholesaler and the particular costs of meeting intervention requirements. Had market prices followed intervention prices downwards, then the expected average price for wheat and barley would have been less than £100 per tonne. In fact, the annual price for barley on the 1994 survey was, at £114 per tonne, up by almost five per cent while the average price for wheat (in terms of volume of sales is much the most important cereal) increased by about three per cent above 1993, from £106 to £109 per tonne.

The upward trend has continued into the 1995 harvest year and by November 1995 the price of feed wheat, at £123 per tonne, was almost 20 per cent above the intervention price for November, and in current terms very similar to the feed wheat price in November 1992, the year before the first stage of the CAP reform was introduced. In the EU, although production still exceeds consumption, the high level of world prices means that wheat and barley can be exported without the need for subsidies and the extra demand this creates is keeping cereals prices buoyant. Whilst high wheat and barley prices are beneficial to the cereal grower, they do cause problems for grain consumers in general and for the intensive livestock sector in particular. With intervention stocks now down to probably less than five million tonnes, compared with 33 million tonnes after the 1992 harvest, the Commission is no longer in a position to release a substantial quantity of grain from intervention, to artificially depress the domestic market price. In the shorter term the price for cereals on the world market and in Europe looks likely to remain buoyant. In the longer term the anticipated response to higher prices from the main cereal growing countries will be

Figure 5.1 UK Cereal Production, 1972-1994 (3 year rolling average)



an increase in overall production followed by some decline in price. However it is likely to take more than one year to return to the position where world stocks and intervention stocks of wheat in particular, are at the levels which existed before 1992.

In the UK, cereal growers have had a further advantage in the form of a devalued green pound. Because the support payments are made in ECUs, the lower exchange rate (i.e. more £s per ECU) has resulted in an increase in the arable area and set-aside payments. This unexpected bonus, in addition to higher than anticipated cereal prices, has been largely responsible for the increase in gross margin in 1994, and had the effect of creating something of a mini-boom for UK cereal growers. For the 1995 marketing year, cereal prices are generally higher than those prevailing in 1994, and in addition there has been an increase in the arable area payments for the third stage of the CAP reforms. This additional output is likely to result in a further increase in gross margins for the 1995 harvest year. Looking forward to the 1996 harvest year the futures prices for wheat, suggest that grain prices for the 1996/97 marketing year again will be well above the intervention price.

Perhaps inevitably there is a downside to the period of improving margins for cereal growers in the form of increasing production costs. Although not evident from the results of the 1994 survey, there are signs that input costs are rising. From discussions with farmers taking part in the survey there is anecdotal evidence that fertiliser and spray chemical prices are on the increase. Also, as indicated by the reports of land agents, land values have soared and rents are following this trend. Re-investment in machinery has gathered pace which will be reflected in higher levels of depreciation. On balance, these trends suggest that the cereal sector in the UK will be less competitive in the future than it was in 1993, when the first stage of the CAP reforms was implemented.

With so many factors outside the EU influencing and enhancing the profitability of cereal production, in the UK in particular, it is difficult to measure precisely the impact of the CAP reforms. To a large extent the reforms, and the need for further change, have been overtaken by events outside the EU. That said, the introduction of 15 per cent set-aside does appear at least to have arrested the increase in total cereal production in the EU-12. However, subsequently it has been necessary to reduce the set-aside requirement in response to the changing circumstances outside as well as within Europe. To date a lowering of the intervention price does appear to have had the desired effect of reducing the domestic price for wheat and barley, and the second objective of this change in policy, to increase the internal consumption of home-grown cereals, is now less important in the shorter term.

Two factors which have had a major influence on the outcome of the CAP reforms in the UK have been the devaluation of the green pound and the rise in the world price of grain. If, for example, the £/ecu exchange rate had remained at the levels operating prior to September 1992, then arable area payments would not have increased, as they did, by about 20 per cent. In addition, if world prices of wheat and barley had remained well below EU support prices, then reducing the intervention price would have had the effect of more seriously reducing the domestic price for grain, probably to about seven per cent below the intervention level. If this had happened, in 1994 the gross margin for winter wheat would have been approximately £691 per hectare, almost 14 per cent below the levels recorded on the 1994 survey (Table 5.1), but still

well above the gross margins achieved for winter wheat between 1990 and 1992. For simplicity the calculations given in this table assume that a stronger exchange rate would have had no immediate effect on prices of materials. Application of similar assumptions to the full cost results published in the 1993 report suggests that the net margin for winter wheat would have declined by about one third.

Table 5.1 Costs and Returns for Winter Wheat Production : Actual and Hypothetical for 1994

	Actual Results 1994	Hypothetical Outcome ⁽¹⁾ 1994
Yield, tonnes per ha	7.75	7.75
Price, £ per tonne	108.4	98.8
	£/ha	£/ha
Output - grain	839.4	765.7
Output - straw	42.3	46.2
Arable area payment	188.6	155.0
Total Output	1070.3	966.9
Material cost	231.4	229.4
Margin over materials	839.0	737.5
Other variable costs	39.8	46.6
Total variable costs	271.2	276.0
Gross margin	799.2	690.9

(1) Hypothetical outcome in the absence of sterling depreciation and a bullish world market. For simplicity the calculations in this column assume that a stronger exchange rate would have had no immediate effect on prices of materials

In sum, it seems fair to say that although several of the objectives of the CAP reform have been achieved, this is probably more the result of the changed market in the world balance than the direct effect of the CAP reforms. One disappointing outcome is likely to be a noticeable increase in the unit cost of cereal production and if, as seems probable, the full objectives of the CAP reforms will be achieved at some stage in the future, then producers in the UK may not be so competitive or as able to cope with less protection and more severe international competition in the longer term.

Appendix A

Figure A.1 The EU Super Regions in the United Kingdom



Table A.1 Winter Wheat Costs and Returns : EU Regions - England 1994 Harvest Year (Weighted)

	North	s.e.m	East	s.e.m.	West	s.e.m
No. of farms	57		151		65	
Yield, tonnes per ha	7.95	(1.30)	7.71	(0.86)	7.44	(1.11)
Price, £ per tonne	107.59	(0.66)	108.47	(0.53)	107.94	(0.83)
	£/ha		£/ha		£/ha	
Output - grain	855.53	(13.50)	836.37	(9.04)	802.62	(11.59)
Output - straw	44.20	(2.88)	23.88	(1.38)	65.30	(2.98)
Arable area payment	191.23	(6.34)	189.91	(4.27)	191.57	(5.58)
Total output	1090.96	(15.19)	1050.16	(10.09)	1059.49	(13.20)
Material costs						
Seed	52.53	(3.35)	51.29	(2.21)	51.96	(2.94)
Fertiliser	82.37	(4.18)	75.49	(2.68)	76.76	(3.50)
Crop protection	82.27	(4.20)	108.40	(3.26)	95.17	(3.96)
Total	217.16	(6.81)	235.18	(4.76)	223.89	(6.04)
Margin over materials	873.80	(13.58)	814.98	(8.89)	835.60	(11.74)
Other variable costs						
Casual labour	0.84	(0.41)	2.20	(0.48)	1.14	(0.45)
Contract	22.69	(1.98)	17.58	(1.03)	30.23	(2.04)
Fuel for grain drying	9.88	(1.46)	7.01	(0.83)	6.74	(1.13)
Miscellaneous	6.88	(1.20)	8.48	(0.90)	9.05	(1.20)
Total	40.30	(2.77)	35.27	(1.67)	47.16	(2.66)
Total variable costs	257.46	(7.35)	270.45	(5.05)	271.05	(6.60)
Gross margin	833.50	(13.30)	779.71	(8.74)	788.44	(11.43)

Table A.2 Winter Barley Costs and Returns : EU Regions - England 1994 Harvest Year (Weighted)

	North	s.e.m	East	s.e.m.	West	s.e.m
No. of farms	60		102		55	
Yield, tonnes per ha	6.75	(0.82)	6.00	(0.64)	6.10	(0.80)
Price, £ per tonne	105.06	(1.01)	111.42	(1.35)	105.98	(1.29)
	£/ha		£/ha		£/ha	
Output - grain	709.56	(8.42)	668.63	(6.81)	647.01	(8.34)
Output - straw	90.97	(3.00)	50.08	(1.81)	99.99	(3.16)
Arable area payment	189.31	(4.35)	188.78	(3.60)	181.85	(4.40)
Total output	989.85	(9.94)	907.50	(7.91)	928.85	(9.94)
Material costs						
Seed	49.55	(2.21)	47.30	(1.79)	48.68	(2.23)
Fertiliser	71.44	(2.68)	63.69	(2.08)	70.16	(2.67)
Crop protection	65.39	(2.52)	77.88	(2.34)	76.34	(2.93)
Total	186.38	(4.29)	188.87	(3.61)	195.18	(4.55)
Margin over materials	803.47	(8.97)	718.63	(7.04)	733.67	(8.84)
Other variable costs						
Casual labour	0.70	(0.25)	2.01	(0.33)	1.06	(0.34)
Contract	18.86	(1.34)	11.99	(0.83)	28.96	(1.57)
Fuel for grain drying	5.25	(0.75)	3.83	(0.48)	4.56	(0.75)
Miscellaneous	7.76	(0.90)	7.49	(0.73)	7.99	(0.86)
Total	32.58	(1.80)	25.32	(1.25)	42.58	(1.97)
Total variable costs	218.97	(4.65)	214.18	(3.82)	237.75	(4.96)
Gross margin	770.88	(8.78)	693.31	(6.93)	691.10	(8.62)

Table A.3 Spring Barley Costs and Returns : EU Regions - England 1994 Harvest Year (Weighted)

	North	s.e.m	East	s.e.m.	West	s.e.m
No. of farms	27		38		24	
Yield, tonnes per ha	5.01	(0.81)	4.81	(0.88)	5.17	(0.83)
Price, £ per tonne	110.59	(1.61)	122.16	(2.19)	114.45	(2.94)
	£/ha		£/ha		£/ha	
Output - grain	554.09	(8.56)	587.36	(9.71)	592.23	(8.99)
Output - straw	80.00	(3.25)	26.09	(2.19)	87.82	(3.24)
Arable area payment	183.65	(4.83)	192.40	(5.54)	170.57	(4.80)
Total output	817.74	(10.36)	805.86	(11.39)	850.62	(10.69)
Material costs						
Seed	52.86	(2.60)	49.69	(2.77)	50.58	(2.62)
Fertiliser	51.24	(2.55)	49.46	(2.81)	52.70	(2.56)
Crop protection	30.31	(1.98)	60.83	(3.06)	56.26	(2.53)
Total	134.41	(4.14)	159.98	(4.99)	159.53	(4.46)
Margin over materials	683.33	(9.49)	645.88	(10.24)	691.09	(9.72)
Other variable costs						
<i>Casual labour</i>	0.73	(0.36)	0.36	(0.15)	1.30	(0.45)
Contract	16.78	(1.37)	14.66	(1.30)	14.56	(1.58)
<i>Fuel for grain drying</i>	6.96	(0.86)	2.22	(0.66)	14.62	(1.04)
Miscellaneous	7.12	(0.95)	5.48	(0.93)	9.91	(1.03)
Total	31.59	(1.91)	22.71	(1.73)	40.39	(2.20)
Total variable costs	166.00	(4.56)	182.69	(5.29)	199.92	(4.97)
Gross margin	651.73	(9.30)	623.16	(10.09)	650.70	(9.47)

Appendix B

Figure B.1 United Kingdom Top Varieties: Wheat and Barley

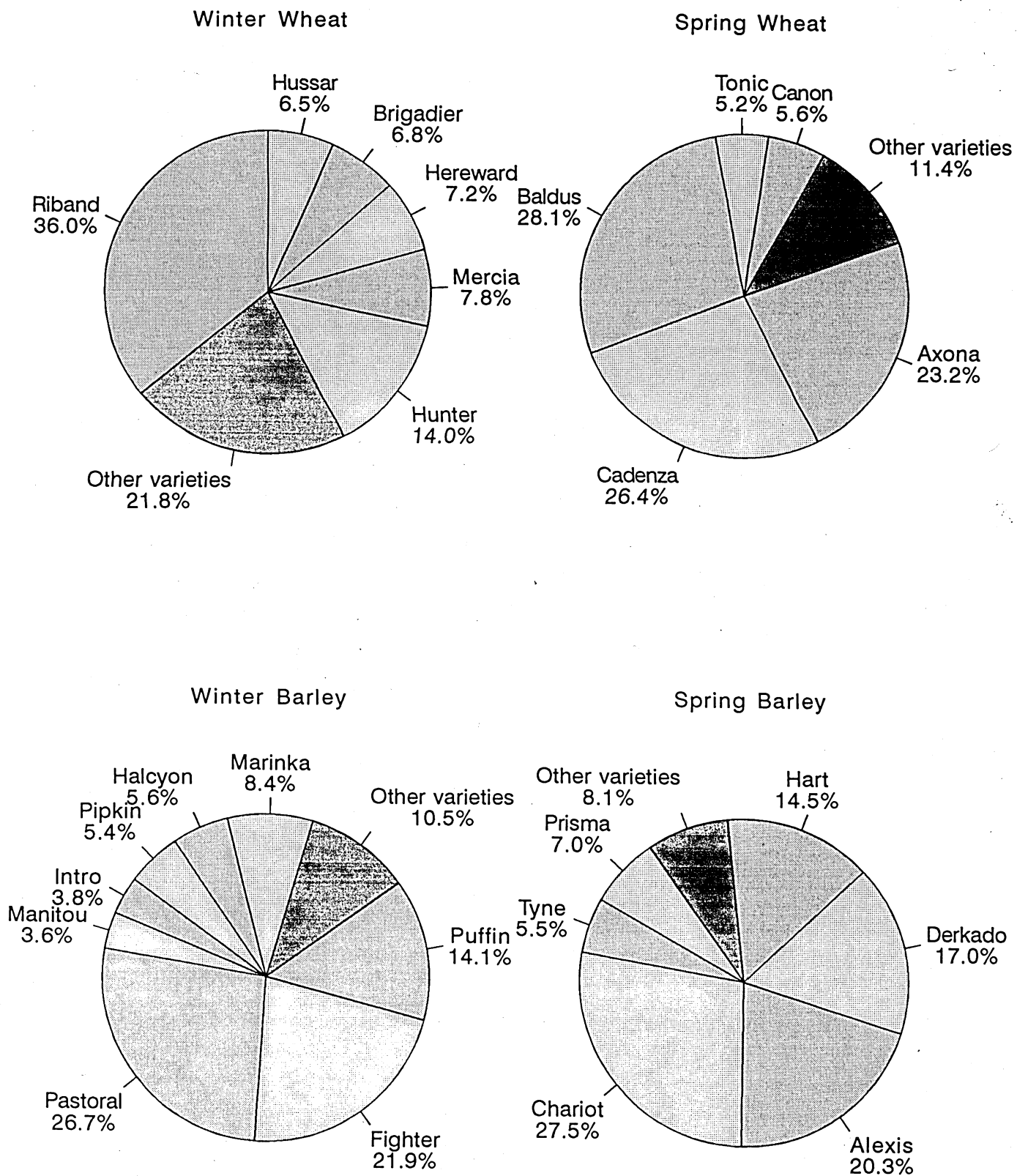


Table B.1 Cereal Intensive Counties of England

Bedfordshire	Lincolnshire
Berkshire	Norfolk
Cambridgeshire	Northamptonshire
Cleveland	Nottinghamshire
Essex	Oxford
Hampshire	Suffolk
Hertfordshire	South Yorkshire
Humberside	Tyne and Wear
Leicestershire	

Table B.2 Non Intensive Cereal Counties

Avon	Kent
Buckinghamshire	Lancashire
Cheshire	Merseyside
Cornwall	Northumberland
Cumbria	North Yorkshire
Derbyshire	Salop
Devon	Scilly Isles
Durham	Somerset
East Sussex	Staffordshire
Gloucestershire	Surrey
Greater London East	Warwickshire
Greater London South	West Midlands
Greater Manchester	West Sussex
Hereford and Worcester	West Yorkshire
Isle of Wight	Wiltshire

Appendix C

Conventions for Cost and Margin Calculations

Total Output

This is the sum of sales or valuation of grain and straw plus the 1994 arable area payment.

Material Costs

The cost of inputs which are an essential part of cereal production, seed, fertiliser and chemical sprays, a cost likely to be incurred by all cereal producers.

Margin over Materials

The value of output less the material costs.

Other Variable Costs

Input costs which are incurred less routinely on sample farms and include contract, casual labour and fuel for grain drying.

Gross Margin

This is the value of output less the material and other variable costs which vary in direct proportion to the size of enterprise.

Appendix D

Reports on Special Studies in Agricultural Economics

- | | | |
|-------|--|-----|
| No 24 | Labour Use on UK Farms: a Pilot Study
Martin Turner and Mark Fogerty
University of Exeter
March 94 | £8 |
| No 25 | Pig Production - 1992/93
by A Sheppard
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| No 26 | Field Scale Vegetables: A Survey of
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The Impact of the CAP Reform
on Production Economics and Marketing
Geoff Davidson and Carol Asby
University of Cambridge
July 1995 | £12 |

These publications are available from the University/College concerned at the address shown at Appendix E.

Appendix E

Provincial Centres of Agricultural Economics

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ASKHAM BRYAN	Rural Business Research Unit Askham Bryan College of Agriculture Askham Bryan York YO2 3PR
MANCHESTER	University of Manchester Department of Agricultural Economics Dover Street Building Oxford Road Manchester
NOTTINGHAM	Rural Business Research Unit University of Nottingham Sutton Bonington Campus Loughborough LE12 5RD
CAMBRIDGE	Agricultural Economics Unit Department of Land Economy 19 Silver Street Cambridge CB3 9EP
WYE	Farm Business Unit Department of Agricultural Economics Wye College (University of London) Wye Ashford Kent TN25 5AH
READING	Department of Agricultural Economics and Management University of Reading 4 Earley Gate Whiteknights Road PO Box 237 Reading RG6 2AR

EXETER

Agricultural Economics Unit
University of Exeter
Lafrowda House
St German's Road
Exeter
EX4 6TL

ABERYSTWYTH

Department of Agricultural Science
University of Wales
Sir George Stapledon Building
Penglais
Aberystwyth
SY23 3DD

EDINBURGH

Rural Resource Management Department
Scottish Agricultural College
West Mains Road
Edinburgh
EH9 3JG

ABERDEEN

Agricultural and Rural Economics Division
School of Agriculture
581 King Street
Aberdeen
AB9 1UD

AUCHINCRAIVE

Economics, Marketing and Management Dept
Scottish Agricultural College
Auchincruive
AYR
KA6 5HW

