

HMSO

THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE
ON FARM CROPS

1994



THE SCOTISH OFFICE
Agriculture and Fisheries Department



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Further statistical analyses of the survey results are also available. For details and costs please contact:

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FOREWORD

The British Survey of Fertiliser Practice provides information on fertiliser use on the major crops and grass grown in mainland Britain.

The Survey is organised and funded jointly by the Fertiliser Manufacturers' Association (FMA), the Ministry of Agriculture, Fisheries and Food (MAFF) and the Scottish Office Agriculture and Fisheries Department (SOAFD). The Survey has the full support of the Farmers' Unions in England, Scotland and Wales.

The Survey is carried out annually and based upon returns from a sample of approximately 1500 farms, a new sample being chosen each year. The survey design, statistical analysis and much of the reporting on results for the 1994 Survey were carried out at the University of Edinburgh; the farm interviews were undertaken by Produce Studies Ltd.

The organisers gratefully acknowledge the cooperation of all farmers taking part in the Survey.

Fertiliser Manufacturers' Association
Ministry of Agriculture, Fisheries and Food
Scottish Office Agriculture and Fisheries Department

January 1995



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We would like to record a special thanks to Lynne Jamieson who worked as Project Assistant for the 1994 Survey and made significant contributions at various stages in the survey process.

The agronomic interpretation of the Survey results benefited from advice from various members of FMA, and from colleagues in our Project Team: Jack McG Hotson (EU Data Library) and Graham Russell (Institute of Ecology and Resource Management, University of Edinburgh).

Further thanks are due to Peter Webb (MAFF) and Julie Rintoul (SOAFD) and to their colleagues at the respective Census offices for drawing the sample of farms for the Survey; to Produce Studies Ltd., especially to Hugh Buller, PSL Operations Manager, for carrying out the field work; and to Kendata Ltd and the University's Computing Service for the Optical Mark Reading form design and for data entry.

The authors would also like to thank the sponsors of the Survey for their continuing support and for their encouragement to widen access to the Survey results. In that respect we express our thanks to the staff of HMSO (Scotland).

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FOREWORD	i
CONTENTS	iii
LIST OF TABLES & FIGURES	v
MAIN POINTS	vii
SECTION A	1
The British Survey of Fertiliser Practice	
1. Introduction	1
2. Definitions	3
SECTION B	4
Commentary on the results from the 1994 British Survey of Fertiliser Practice	
1. Overall fertiliser usage	4
2. Fertiliser use on major tillage crops	12
3. Fertiliser use on grassland	21
SECTION C	27
Survey methodology and sampling variation	
SECTION D	33
Tables	

LIST OF TABLES AND FIGURES

Table B1.1	Overall fertiliser usage, Great Britain 1992 – 1994 (kg/ha)	4
Table B1.2	Overall fertiliser usage 1987 – 1994 (kg/ha)	6
Table B2.1	Overall fertiliser usage on major tillage crops 1989-1994 (kg/ha)	13
Table B2.2	Average field rates on major tillage crops 1989-1994 (kg/ha)	14
Table B2.3	Distribution of field application rates of N on major crops, England & Wales 1992 – 1994	17
Table B2.4	Distribution of field application rates of N on major crops, Scotland 1992 – 1994	20
Table B3.1	Overall fertiliser usage on grass 1988 – 1994 (kg/ha)	21
Table B3.2	Dressing cover on grassland 1990 – 94 (%)	21
Table B3.3	Average field rates of N on grassland 1990 – 1994(kg/ha)	21
Table B3.4	Grassland utilisation 1989 – 1994 (% of crop area)	22
Table B3.5	Fertiliser application rate by grass utilisation 1989 – 1994	24
Table C1	Sampling Characteristics of British Survey of Fertiliser Practice 1994	27
Table C2	Summary Sampling Characteristics 1994	28
Table C3	Response to Main and Reserve Samples	29
Table C4	Analysis of non-response 1992-1994	29
Table C5	Standard errors for application rates for the major crops in 1994	30
Figure B1.1	Overall fertiliser usage on all crops and grass, Great Britain 1992 – 1994	4
Figure B1.2	Nitrogen usage in Britain 1992 – 1994	5
Figure B1.3	Overall use of N in England & Wales 1970-1994	8
Figure B1.4	Overall use of straight and compound N in England and Wales 1970 – 1994	8
Figure B1.5	Overall use of P ₂ O ₅ and K ₂ O England & Wales 1970 – 1994	9
Figure B1.6	Overall use of N, Scotland 1983 – 1994	10
Figure B1.7	Overall use of straight & compound N, Scotland 1983 – 1994	10
Figure B1.8	Overall use of P ₂ O ₅ and K ₂ O, Scotland 1983 – 1994	11
Figure B2.1	Cropping patterns in England & Wales 1988 – 1994	12
Figure B2.2	Cropping patterns in Scotland 1988 – 1994	12
Figure B2.3	Application of N during the period August to January, England & Wales 1988 – 1994	18
Figure B3.1	Nitrogen use by grass utilisation, England and Wales 1983 – 1994	23
Figure B3.2	Nitrogen use by grass utilisation, Scotland 1983 – 1994	25



MAIN POINTS FROM THE 1994 BRITISH SURVEY OF FERTILISER PRACTICE

The Survey estimates for Great Britain in 1994 show:

- Overall rates of N, P₂O₅ and K₂O on all crops and grass up on 1993 rates.
- Total N use on tillage crops up by 10 kg/ha – a recovery to the 1992 level.
- Total N use on grass up by 4 kg/ha, to 116 kg/ha.
- More use of P₂O₅ and K₂O, on both tillage crops and grass.

The estimates for England and Wales in 1994 show:

- Total N rate on tillage crops rose by 12 kg/ha; a recovery due to increased overall use of both straight and compound N, especially on spring and winter barley, and on sugar beet.
- Total N rate on grass up by 5 kg/ha, (with greater use of compound N offsetting lower straight N use), but not yet recovered to pre-1992 average.
- P₂O₅ and K₂O rates up slightly for both tillage and grass.

The estimates for Scotland indicate:

- Total N rate on tillage crops down by 2 kg/ha, with decline in N use on oilseed rape.
- Overall N usage on grass down by 3 kg/ha, back to pre-1993 levels, due to a drop in the rate for compound N against a small increase in straight N use.
- P₂O₅ and K₂O rates largely unchanged on tillage crops, apart from an increase of 13 kg/ha P₂O₅ on winter wheat. Overall K₂O rate on grass down by 4 kg/ha.
- Application rates of P₂O₅ and K₂O, as for N, show no long term change.

Commentary and further details on the Survey results is set out in Section B of the Report. Additional data for 1994 are reported in Section D.

SECTION A – THE BRITISH SURVEY OF FERTILISER PRACTICE

1 – Introduction

The main purpose of the Survey is to estimate, for a range of crops and nutrients, the average rate of fertiliser and lime application used annually in agricultural production. The Survey is used by the British Fertiliser Industry, by Government and by the wider agricultural community. It is the principal source of information on rates of field application and on fertiliser use. The Survey also serves an important role, when used in conjunction with the estimates of crop area from the annual Agricultural Census, of enabling the tonnage of fertiliser used annually to be estimated. Annual fertiliser delivery statistics, which can also be used to estimate this information, can be poor indicators of consumption when stocks fluctuate in response to economic changes and agricultural practice. In addition recent changes in the reporting of import statistics have further decreased the reliability of these data.

Rates of fertiliser application for 1994 are reported in detail in Section D. The Tables are grouped and referenced by geographic coverage: Britain (GB), England and Wales (EW) and Scotland (SC). There are tables covering the major crop groups, grassland and farm types. There are separate tables for total use and for 'straight' and 'compound' products. For example, Table EW 1.2 contains information on the application of Straight N, P₂O₅ and K₂O in England and Wales for major crops and grassland.

HISTORY

The British Survey of Fertiliser Practice (BSFP) has its origins in surveys begun during wartime in 1942 under Dr Frank Yates, conducted thereafter as the Survey of Fertiliser Practice for England and Wales. The Survey was re-designed in 1969 as an annual survey to monitor changes in the pattern of fertiliser use, and the methodology was extended to Scotland in 1983. In 1992 responsibility for the management and design of the Survey passed from Rothamsted Experimental Station to a research services team led by the Data Library at the University of Edinburgh – see Burnhill, Chalmers and Fairgrieve (1994)†. Publications with information on past survey results and trends include those by Chalmers, Kershaw and Leech (1990), Church and Lewis (1977) and Yates and Boyd (1965)†.

In earlier years the Surveys for England and Wales and for Scotland were run in parallel, with separate Reports of their findings. The convention adopted since 1992 is to compile summary tables of British fertiliser practice into a single report, combining the equivalent tables for England and Wales and for Scotland. Commentary on change is set out in Section B.

TRENDS

We include commentary on results for previous years in Section B of this report. Recent changes in agricultural policies and financing have been affecting fertiliser practice and we wish to provide evidence for others to use in their investigations. We have included summary tables on both the average field rates of nutrient fertiliser application, in order to show changes in farmers' fertiliser practice, and the overall rates of application, to allow estimates of total tonnage applied.

†

Burnhill, P M, Chalmers A G & Fairgrieve, J (1994) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1993*. HMSO, Edinburgh 1994 ISBN 0 11 495 238 8 (£20)

Chalmers, A G, Kershaw, C D & Leech, P K (1990) 'Fertiliser use on farm crops in Great Britain: results from the Survey of Fertiliser Practice, 1969-88' *Outlook on Agriculture* 19 pp 269-278

Church, B M & Lewis, D A (1977) 'Fertiliser use on farm crops, England & Wales: information from the Survey of Fertiliser Practice, 1942-1976' *Outlook on Agriculture* 9 pp 186-193

Yates, F & Boyd D A (1965) 'Two decades of Surveys of Fertiliser Practice' *Outlook on Agriculture* 4 pp 203-21

SAMPLING

The 1994 British Survey of Fertiliser Practice involved the random selection of a nationally representative sample of approximately 1500 farm holdings in Great Britain (1195 from England and Wales and 250 from Scotland). As part of the selection process farms with less than 20 hectares of crops and grass were excluded from the Survey. The remainder were stratified according to four size groups and six farm type groups (four for England and Wales and two for Scotland). This produced twenty-four stratification cells in all, the number of farm holdings sampled within each varying in proportion to the total area of crops and grass.

Further details of sampling including estimates of sampling error are given in Section C of this report.

FIELDWORK

The farms in the sample were visited by Produce Studies Ltd., who carried out interviews with farmers and farm managers between mid-June and September 1994, recording information on fertiliser use during the 1993-94 growing season. Information on about 17,000 fields was recorded on special field sheets, designed to be read automatically for data transfer at the University of Edinburgh.

CONFIDENTIALITY

Throughout the administration of the Survey, strict safeguards were applied to ensure accuracy and the confidentiality of information relating to individual farms. The Data Library at the University ensures that none outside the Survey team may identify individual farm data.

2 – Definitions

1. For the purpose of the Survey, the term **Britain** is used to cover mainland Britain, Anglesey and the Isle of Wight.
2. The **survey year** ran from 1 October 1993 to 30 September 1994 corresponding to the 1994 growing year or the post-1993 harvest year. The recording period for fertiliser application varied for different crop and grass groups.
3. For the purposes of this survey, a **field** is defined as any single area of land measuring more than 0.2 ha (half an acre) which has had a uniform cropping and fertiliser history since October 1993. Two areas within the same natural boundary receiving different treatments (crops or fertilisers) were recorded separately. Agricultural land which had been set aside under the Arable Area Payment Scheme was recorded but was not included in analyses unless used to grow an industrial crop. Fallow land other than set aside was always recorded in the survey.
4. In the report **tillage** is defined as all crops except grass, forestry and glasshouse crops. **Grass** refers to all forms of grass which may be grazed, conserved or grown for seed production. Rough grazing is excluded.
5. The abbreviation **N** is used for Nitrogen; P_2O_5 or **P** for Phosphate; K_2O or **K** for Potash. The phrase **total use** includes both Straight and Compound products.
6. For each fertiliser nutrient, the **overall application rate** is calculated by the ratio of the total quantity of nutrient used, in kilograms (kg), to the total extent of crop area, in hectares (ha). When combined with knowledge of the national total crop area, these overall application rates provide the means to estimate the national tonnage of fertiliser used during the survey year.
7. The **average field rate (of application)** is the rate of nutrient used by farmers on those fields which received any dressing of the nutrient. Crop area without any application of the nutrient is excluded from the calculation of the average field rates of application. These field-specific application rates provide direct evidence on the level and variation in farming practice.
8. The term **dressing cover** is used to describe the proportion of crop area treated with any dressing of the fertiliser nutrient in question, and is stated as a percentage.

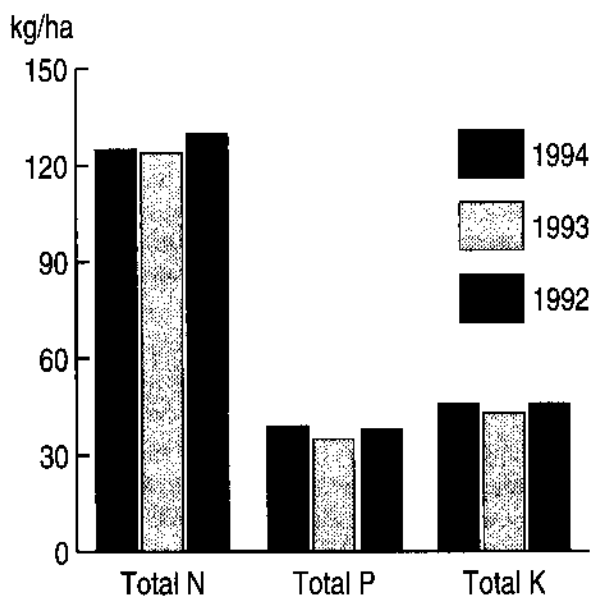
Any change in an overall application rate is due to a change in the (average) field rate of application used on farms or to a change in the dressing cover, or due to changes in both. Arithmetically, the overall rate is equivalent to the sum obtained by multiplying the average field rate of application by the proportion of crop area that receives any nutrient dressing. The overall application rate of a nutrient on a crop by definition, then, cannot be greater than the average field rate of application.

SECTION B - COMMENTARY ON THE RESULTS FROM THE 1994 BSFP

1 - Overall Fertiliser Usage

GREAT BRITAIN

Figure B1.1 Overall fertiliser usage on all crops & grass 1992-1994



Overall application rates of all three major nutrients (N, P₂O₅ and K₂O) increased in 1994 for the all crops and grass category. N use increased by 6 kg/ha. In 1994, P₂O₅ and K₂O rates recovered to the levels reported for 1992 (Figure B1.1 and Table B1.1).

Table B1.1 Overall fertiliser usage, Great Britain 1992 - 1994 (kg/ha)

Total N						
			<i>tillage</i>	<i>grass</i>	<i>all crops and grass</i>	
			1992	146	106	125
			1993	137	112	124
			1994	147	116	130

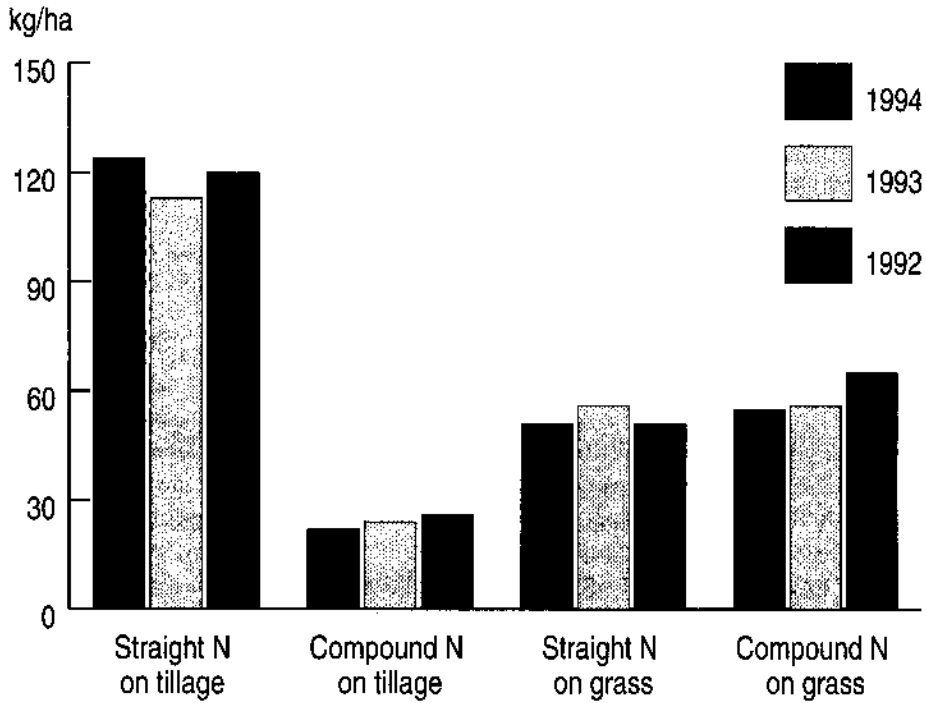
Straight N			Compound N			
<i>tillage</i>	<i>grass</i>	<i>all crops and grass</i>		<i>tillage</i>	<i>grass</i>	<i>all crops and grass</i>
124	51	87	1992	22	55	39
113	56	82	1993	24	56	41
120	51	84	1994	26	65	47

Total P ₂ O ₅			Total K ₂ O			
<i>tillage</i>	<i>grass</i>	<i>all crops and grass</i>		<i>tillage</i>	<i>grass</i>	<i>all crops and grass</i>
56	22	39	1992	64	28	46
52	21	35	1993	60	29	43
53	24	38	1994	63	31	46

N

Use of N on tillage crops increased by 10 kg/ha, a recovery from the drop in N rate that occurred in 1993. This was due to greater use of straight N and, to a lesser extent, a steady increase in compound N usage. Total N rate on grass showed a net increase of 4 kg/ha, the increased usage of compound N more than compensating for the fall back in straight N usage. N use on grassland has increased consistently since 1992, reflecting changes in N use in England and Wales.

Figure B1.2 Nitrogen usage in Britain 1992-1994



P₂O₅ AND K₂O

The overall application rates of both P₂O₅ and K₂O increased by 3 kg/ha, for all crops and grass, because of small increases on grass and, for K₂O, also on tillage crops.

Overall fertiliser rates from 1987 to 1994 are shown in Table B1.2, for England and Wales and for Scotland. The longer term trends for England and Wales since 1970 and for Scotland since 1983 are illustrated in Figures B1.3, B1.4 and B1.5 (England and Wales) and B1.6, B1.7 and B1.8 (Scotland).

Table B1.2 Overall fertiliser usage 1987 – 1994 (kg/ha)

TOTAL N						
	<i>tillage</i>		<i>grass</i>		<i>all crops and grass</i>	
	E&W	Scot	E&W	Scot	E&W	Scot
1987	160	139	133	116	147	125
1988	149	125	116	132	133	129
1989	150	128	127	111	139	118
1990	149	131	132	116	141	122
1991	154	128	133	111	143	117
1992	147	125	104	111	126	116
1993	137	130	112	114	124	119
1994	149	128	117	111	133	118

STRAIGHT N						
	<i>tillage</i>		<i>grass</i>		<i>all crops and grass</i>	
	E&W	Scot	E&W	Scot	E&W	Scot
136	82	75	39	105	56	1987
125	74	61	52	94	61	1988
130	74	70	36	100	48	1989
131	82	68	38	100	55	1990
138	75	69	36	104	51	1991
132	74	55	36	94	49	1992
118	80	63	33	89	49	1993
127	72	54	37	90	50	1994

COMPOUND N						
	<i>tillage</i>		<i>grass</i>		<i>all crops and grass</i>	
	E&W	Scot	E&W	Scot	E&W	Scot
25	57	58	77	41	69	1987
24	51	55	80	39	68	1988
20	54	57	81	39	70	1989
18	49	64	78	41	67	1990
16	53	64	75	39	67	1991
15	51	49	75	32	67	1992
19	50	49	81	35	70	1993
22	56	63	74	43	68	1994

TOTAL P₂O₅						
	<i>tillage</i>		<i>grass</i>		<i>all crops and grass</i>	
	E&W	Scot	E&W	Scot	E&W	Scot
56	71	23	28	39	45	1987
53	65	21	31	38	45	1988
52	67	23	31	38	45	1989
51	68	24	28	38	43	1990
53	65	23	24	38	40	1991
51	67	19	30	35	43	1992
49	65	19	28	33	41	1993
51	69	23	29	37	43	1994

TOTAL K₂O						
	<i>tillage</i>		<i>grass</i>		<i>all crops and grass</i>	
	E&W	Scot	E&W	Scot	E&W	Scot
63	70	33	31	48	47	1987
63	66	30	34	47	47	1988
60	73	34	36	48	51	1989
62	74	36	35	49	50	1990
62	72	35	31	49	47	1991
59	72	26	34	43	48	1992
58	72	27	34	42	47	1993
62	74	31	30	46	46	1994

ENGLAND AND WALES

N

The total N rate on **all crops and grass** in England and Wales increased by 9 kg/ha in 1994. This represented a partial recovery in N usage after the significant drop in 1992 and further slight decline in 1993. The overall rate of 133 kg/ha N was the same as in 1988, but remains below the previous average rates. N rates on grass have only partially recovered since the large decrease in 1992.

Total N use on **tillage crops** increased by 12 kg/ha in 1994, a recovery to levels similar to those reported for the 1988 – 92 period. This was due to a partial recovery in straight N use and a continuing increase in the overall rate of compound N. Compound N usage had declined steadily to a minimum of 15 kg/ha in 1992 but since then has increased by 7 kg/ha to 22 kg/ha.

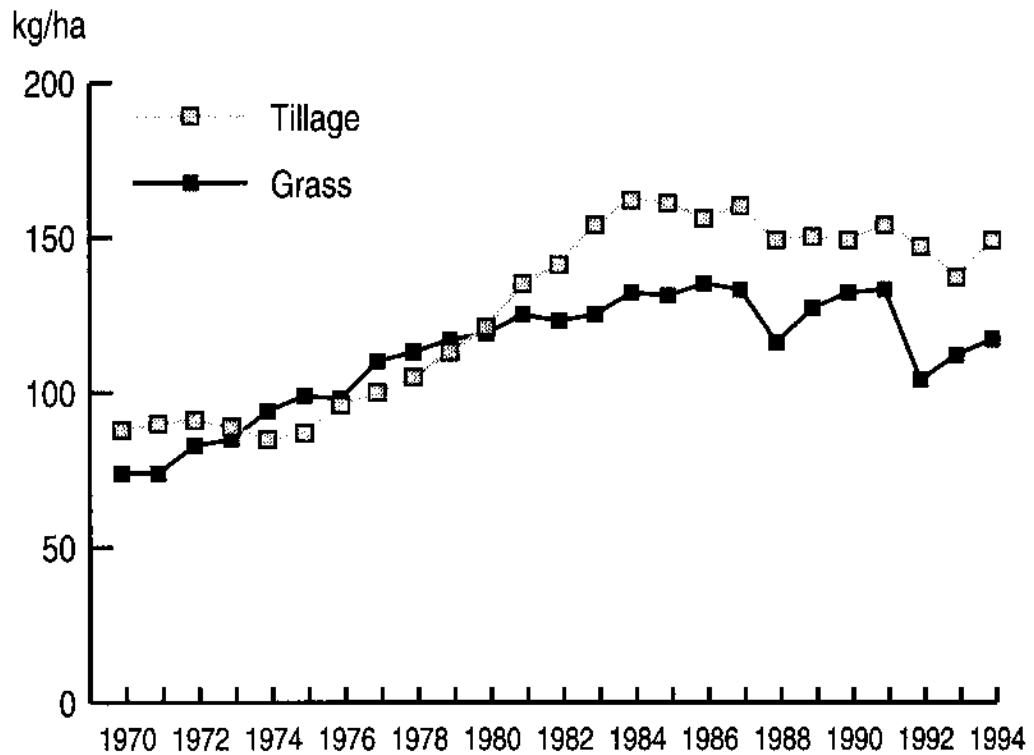
Total N use on **grass** increased in 1994, continuing a partial recovery from the sudden drop in 1992. The recovery in 1994 was accompanied by a switch to compound N products, with a large (14 kg/ha) increase in compound N use, up to 1990 – 91 levels. This more than countered the decrease in the overall rate of straight N, which reverted to the 1992 rate.

The large increase in the overall rate of **compound N for grass** in 1994 resulted from both an increase in the percentage dressing cover across all grassland and an increase in the average field rate (Tables B3.2 and B3.3). In contrast, the decrease in overall rate of straight N during 1994 was due to drop in the dressing cover across all grassland, a drop which was not offset by the higher average field rate. The net result of those changes for both types of N was that the overall total N rate on grass in 1994 was still markedly below the average for the pre-1988 and 1989 – 91 periods (Table B1.2 and Figure B1.3).

A large part of the recovery in N use on **tillage crops** was due to four crops: a substantial increase in the overall N rate on spring barley to 101 kg/ha (about 10 kg/ha above the average for recent years); a recovery in N use on winter barley; and increases on sugar beet and oilseed rape (Table B2.1 – discussed later).

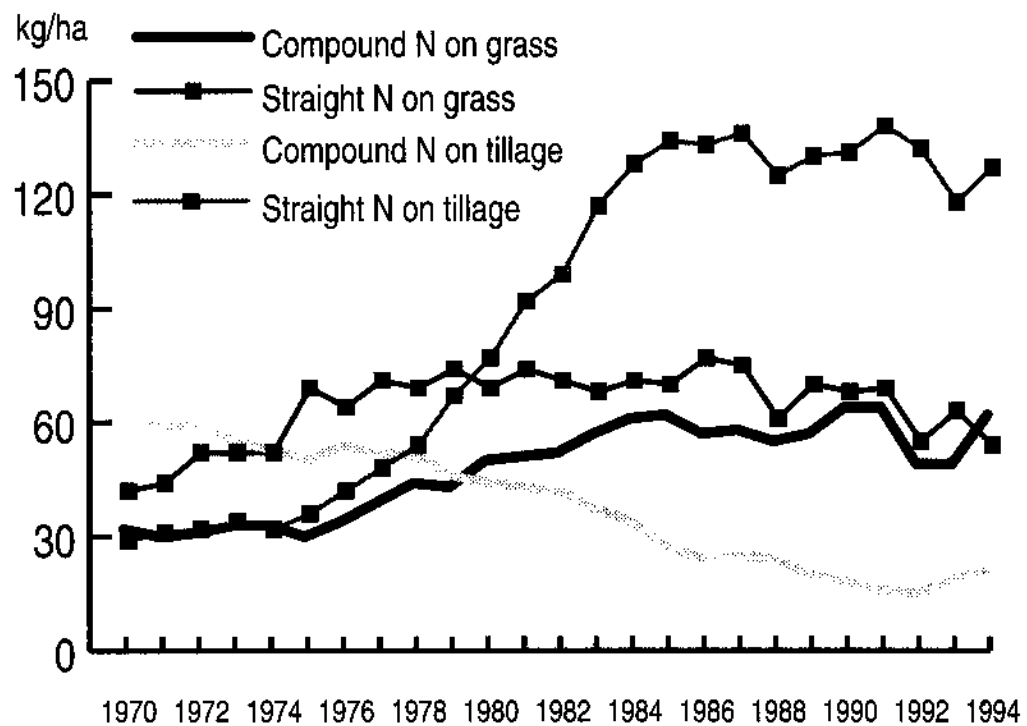
Changes in the pattern of tillage cropping areas could also have contributed to the increase in the overall rate in 1994 (Figure B2.1 – discussed later).

Figure B1.3 Overall use of N in England and Wales 1970-1994



The longer term trends for compound and straight N are illustrated in Figure B1.4. The long run decline in the overall rate of compound N on tillage crops appears to have come to an end, with two years of increase. Overall usage of compound N on grass has become more variable in recent years. A long term decline of straight N on grass is evident. It is not clear whether there is any such trend for straight N on tillage crops.

Figure B1.4 Overall use of straight and compound N, England and Wales 1970-1994

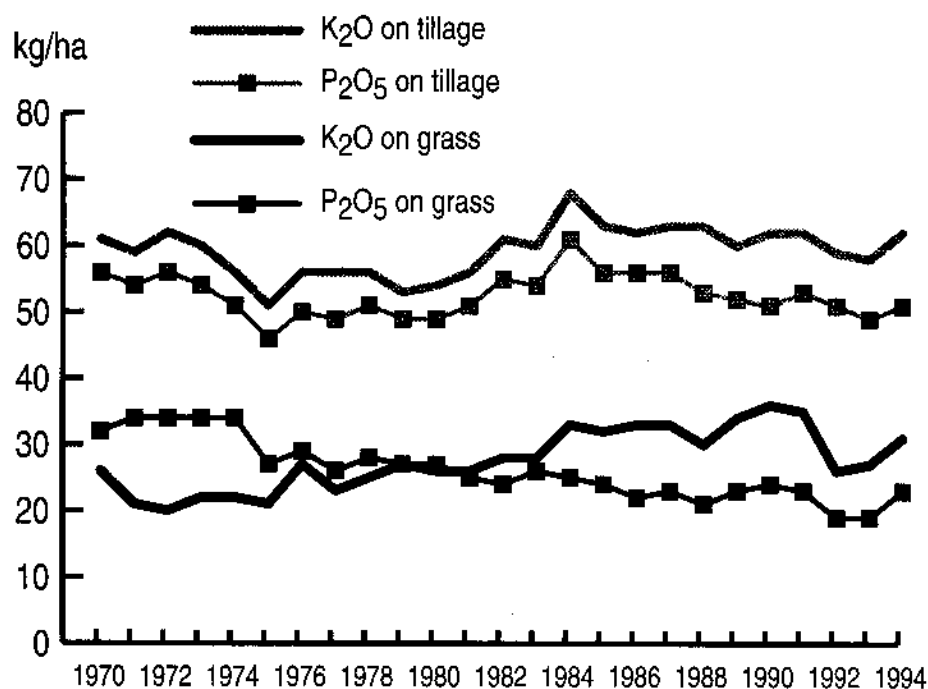


P₂O₅ AND K₂O

Overall rates of P₂O₅ and K₂O both increased by 4 kg/ha on **all crops and grass** in 1994, following a small decline in the previous two years. These increases were caused by upturns in the application rates of each nutrient on both **tillage crops** and on **grass**. This may be part of a general switch to compound products in 1994.

The small increases in P₂O₅ and K₂O use on tillage crops in 1994 may signal an end to the long run trend since 1987 (Figure B1.5) towards lower P₂O₅ and K₂O overall rates on **tillage crops**. Overall rates of P₂O₅ and K₂O on **grass** also showed signs of recovery, although the K₂O rate exhibits more year-on-year variation and is still below the average in the 1989 – 91 period.

Figure B1.5 Overall use of P₂O₅ and K₂O, England and Wales 1970-1994



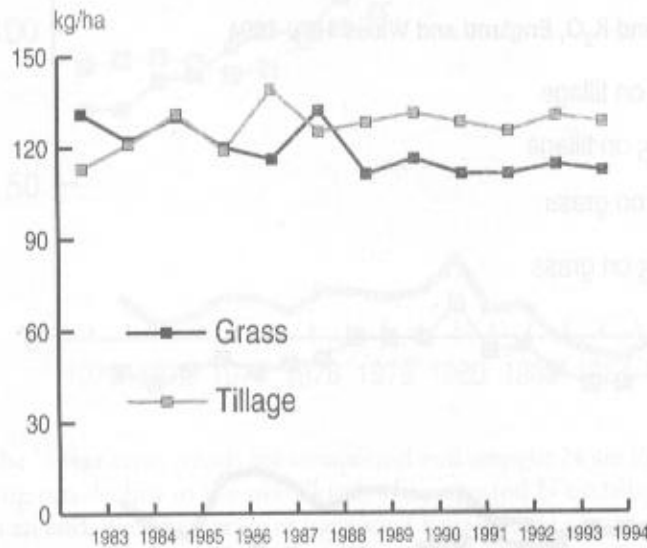
SCOTLAND

N

The Survey results show little discernible change in total N use for Scotland, the reported change being consistent with the variation in annual estimates over the past ten year period (Figure B1.6). Clearly, there is much less year-on-year variation in the estimates of total N use in Scotland.

For example, the overall N rate for **all crops and grass** decreased by only 1 kg/ha in 1994, well within the sampling variation for the Survey.

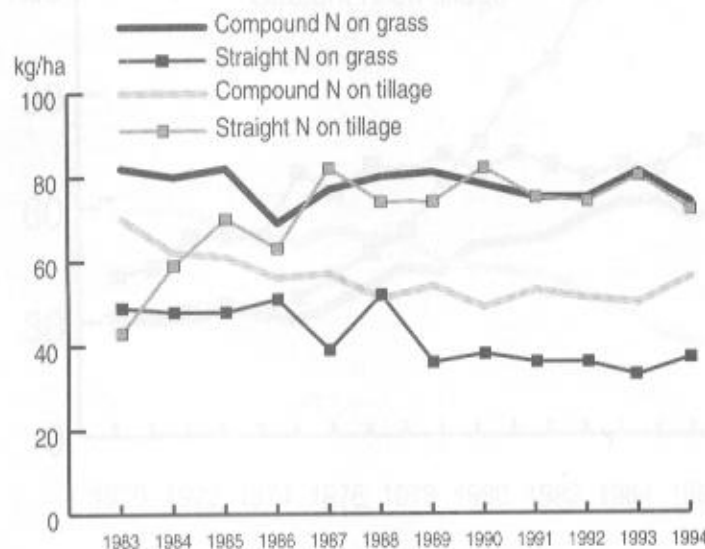
Figure B1.6 Overall use of N, Scotland 1983-1994



Overall N use on **tillage** crops was 2 kg/ha less than in 1993, with a substantial decrease in N use on oilseed rape, from 145 kg/ha to 114 kg/ha (Table B2.1- on page 12).

There was a significant decrease of 7 kg/ha in compound N use on grass, but, with a 4 kg/ha increase in the straight N rate, there was only a small net decrease of 3 kg/ha in the overall total N rate on **grass** in 1994.

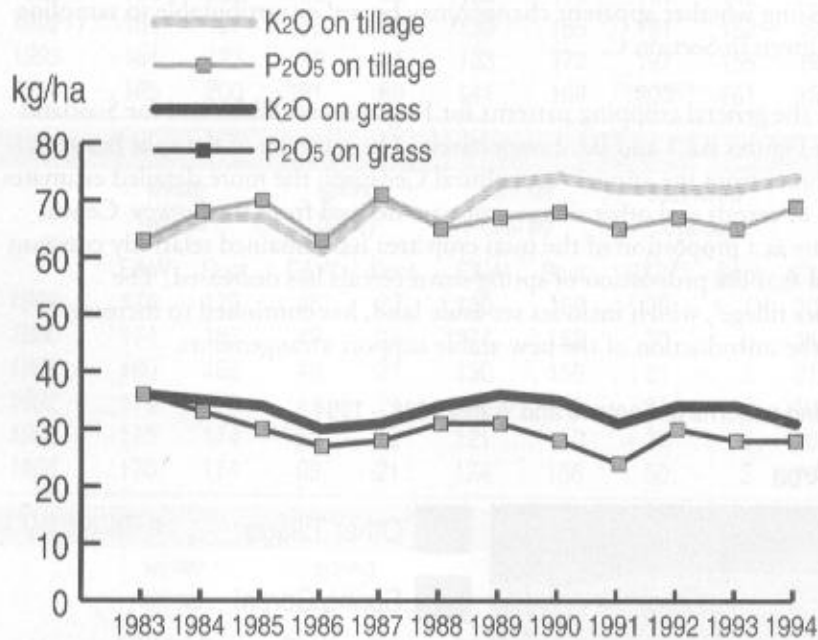
Figure B1.7 Overall use of straight and compound N, Scotland 1983-1994



P₂O₅ AND K₂O

The results for tillage and grass (Table B1.2 and Figure B1.8) indicate no clear long term trend in overall rates of P₂O₅ and K₂O. In 1994, the K₂O rate for grass dropped to its lowest level since 1987, but there is suggestion of upturns for both P₂O₅ and K₂O on tillage crops.

Figure B1.8 Overall Use of P₂O₅ and K₂O, Scotland 1983-1994



2 – Fertiliser use on major tillage crops

Estimates of overall fertiliser use for the major tillage crops from 1989 to 1994 are shown in Table B2.1. Equivalent estimates for average field rates of application are given in Table B2.2. Some more detailed statistics are presented in Section D.

Small apparent changes in fertiliser use on individual crops should be treated with some caution as these estimates are based on a smaller number of fields than those for the main crop groupings of tillage, grass and all crops and grass. Information on 'sampling errors', which help in assessing whether apparent changes may be real or attributable to sampling variation alone, is given in Section C.

Recent changes in the general cropping patterns for England and Wales and for Scotland are summarised in Figures B2.1 and B2.2 respectively. The estimate of the split between tillage and grass comes from the annual Agricultural Censuses; the more detailed estimates of the percentages of cereals and other tillage crops are derived from the Survey. Census data show that grass as a proportion of the total crop area has decreased in recent years and that the proportion of spring sown cereals has decreased. The proportion of 'other tillage', which includes set-aside land, has continued to increase, particularly since the introduction of the new arable support arrangements.

Figure B2.1 Cropping patterns in England and Wales 1988 – 1994

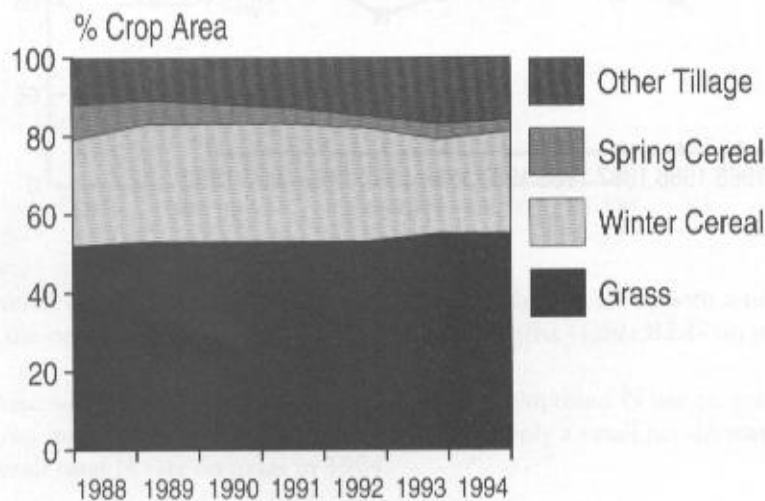


Figure B2.2 Cropping patterns in Scotland 1988-1994

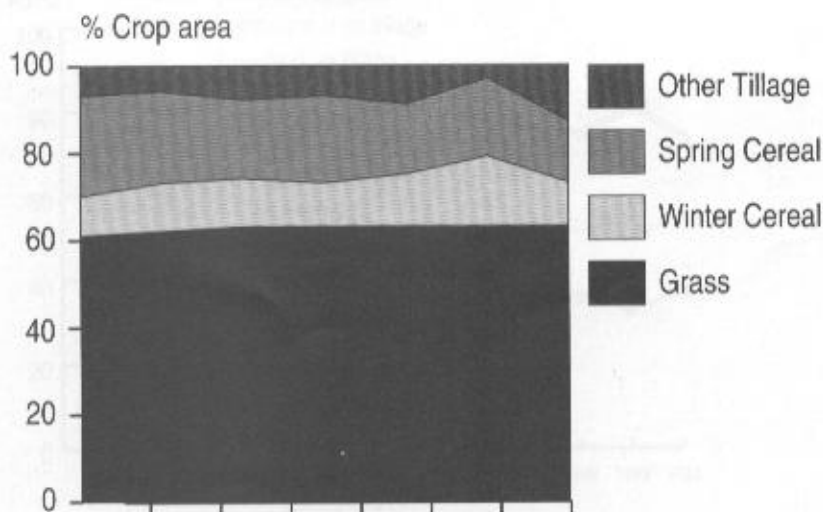


Table B2.1 Overall fertiliser usage on major tillage crops 1989-1994 (kg/ha)

TOTAL N												
	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	
1989	181	195	91	91	142	182	202	173	231	251	119	
1990	182	200	92	91	137	174	190	166	227	214	121	
1991	186	202	89	89	138	179	191	148	227	227	122	
1992	184	197	88	92	139	165	181	152	198	189	115	
1993	184	193	90	94	133	172	197	155	179	182	110	
1994	185	200	101	89	141	166	200	161	183	159	122	
STRAIGHT N												
	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	
1989	174	179	46	23	130	156	29	1	207	212	79	
1990	174	182	49	28	124	158	33	0	210	189	93	
1991	180	185	48	21	130	156	31	0	212	192	93	
1992	178	176	44	25	128	142	31	2	185	150	88	
1993	173	174	52	32	121	150	36	4	164	145	86	
1994	170	174	68	21	124	136	50	2	164	114	92	
COMPOUND N												
	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	
1989	7	16	45	68	12	27	173	172	23	39	40	
1990	8	17	44	63	11	16	157	166	17	24	29	
1991	6	17	41	68	8	24	160	148	15	36	28	
1992	6	21	45	68	11	23	150	149	13	39	27	
1993	11	20	39	62	12	22	160	152	15	38	24	
1994	15	27	32	68	17	31	150	159	19	44	30	
TOTAL P₂O₅												
	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	
1989	50	70	38	53	51	74	204	192	52	63	57	
1990	49	73	35	55	51	69	206	169	51	61	61	
1991	51	67	35	52	52	76	212	144	59	65	54	
1992	50	76	35	53	54	81	188	182	53	63	59	
1993	50	68	36	55	50	74	190	163	51	55	58	
1994	50	81	32	53	50	74	196	184	47	62	57	
TOTAL K₂O												
	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	
1989	48	77	46	57	60	77	259	286	49	68	140	
1990	50	82	45	57	61	77	267	238	55	71	141	
1991	51	80	46	56	61	90	277	193	54	76	141	
1992	50	84	43	61	62	87	264	222	53	69	136	
1993	46	72	48	61	59	79	271	218	46	63	139	
1994	51	84	45	60	61	75	259	227	49	64	127	

Table B2.2 Average field rates on major tillage crops 1989-1994 (kg/ha)

TOTAL N

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1989	182	195	94	92	143	182	208	173	233	251	121
1990	184	200	97	92	139	174	193	166	228	220	122
1991	187	202	90	89	139	179	192	162	227	227	127
1992	187	200	90	93	140	165	193	156	199	189	122
1993	185	194	94	94	133	176	203	163	181	182	115
1994	186	201	103	90	142	170	202	169	186	159	127

STRAIGHT N

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1989	177	186	83	60	136	162	139	55	213	214	108
1990	177	183	86	60	132	158	108	52	212	196	112
1991	182	185	84	60	135	159	102	0	214	192	111
1992	182	183	87	56	135	145	114	86	189	160	107
1993	178	178	87	60	128	158	108	61	172	164	105
1994	175	176	94	51	132	151	124	60	174	142	108

COMPOUND N

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1989	28	30	60	70	36	32	189	172	49	43	87
1990	39	27	67	66	42	24	173	166	42	36	83
1991	36	33	59	69	42	35	179	162	41	46	99
1992	42	34	63	71	53	34	172	154	40	52	80
1993	49	40	64	67	49	36	178	159	43	50	72
1994	45	35	58	71	47	38	175	168	45	49	86

TOTAL P₂O₅

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1989	63	78	43	54	58	78	213	192	64	64	64
1990	63	74	44	55	60	74	208	169	62	66	68
1991	67	73	43	53	63	79	216	158	69	69	65
1992	68	78	44	55	64	81	201	187	68	64	77
1993	67	73	44	57	61	76	200	171	65	60	74
1994	67	85	43	54	64	78	211	192	65	65	80

TOTAL K₂O

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>		<i>maincrop potatoes</i>		<i>oilseed rape</i>		<i>sugar beet</i>
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1989	66	84	51	58	68	82	271	286	65	69	145
1990	69	83	53	57	71	82	270	238	68	76	144
1991	71	83	50	57	74	91	285	211	70	80	145
1992	72	85	50	62	75	87	279	228	73	69	152
1993	69	77	57	62	72	81	284	229	65	68	156
1994	72	88	57	61	76	79	276	238	71	66	144

ENGLAND AND WALES

Average N use in 1994 recovered on **winter barley**, after a temporary drop in 1993; it increased significantly on both **spring barley** and **sugar beet**. Average N use also increased slightly on **oilseed rape** but was virtually unchanged on **winter wheat** and **maincrop potatoes**. These increases in total N rates resulted from greater use of straight N on both barley crops and sugar beet, and more compound N use on winter barley, oilseed rape and sugar beet.

Application of N to winter cereals and winter oilseed rape during the autumn and winter period has shown a major decline over recent years. However, this trend did not continue into the 1993/94 cropping season, usage being similar to the previous year.

The K_2O rate on sugar beet decreased significantly in 1994 and several crops showed small changes in overall rates of P_2O_5 and/or K_2O .

N

Total N use on tillage crops recovered in 1994 to the average level reported for the 1988 – 90 period. This increase was due to greater use of both straight and compound N in 1994.

Total N usage on **winter wheat** was virtually unchanged at 185 kg/ha, as the increased use of compound N offset the small drop in overall rate of straight N (Table B2.1). There is evidence here of the switch since 1987 from straight N to compound N products, possibly as a means of combining an early spring top dressing of N with annual 'maintenance' P_2O_5 and K_2O requirements.

The sharp increase of 11 kg/ha in total N use on **spring barley** in 1994 is unexpected. It may, for example, reflect changes in varietal choice and choice of market outlet, rather than extra amounts of N to compensate for possible leaching losses from earlier N dressings in the wet spring. One suggestion is that more of the barley grown for malting is intended for the production of lager, which allows higher N content in grain and so larger inputs of N fertiliser.

The increase in the overall rate of total N (8 kg/ha) for **winter barley** represents a recovery to previous levels of N application, following a temporary drop in 1993. There has been, as for winter wheat, a general increase in the overall rate of compound N applied to winter barley since 1991. The recovery in total N rate in 1994 was, however, also related to greater use of straight N than in 1993.

Total N use on **oilseed rape** (averaged across all types) increased slightly in 1994, following a sharp drop in 1992 and a further decrease of 19 kg/ha in 1993. The decrease in 1992 was attributed to the transitional Oilseeds Scheme, which reduced rapeseed commodity prices appreciably and, consequently fertiliser N requirements. When oilseeds were incorporated within the Arable Area Payment Scheme in 1993, N recommendations remained unchanged. The further drop in N use in 1993 was attributed, in large part, to a large increase in the proportion of the oilseed rape cropping area that was spring (33%), rather than autumn (67%) sown, compared with previous years (MAFF, 1993)¹. Spring sown oilseed rape requires less fertiliser N than the autumn sown crop because of its lower yield potential. In 1994, the proportion of the crop area that was spring sown increased to an estimated 43% (MAFF 1994)². Nevertheless, in 1994 the overall N rate increased by 4 kg/ha as a product of increases in both the average field rate and dressing cover of compound N. Table B2.3 suggests that there was also an increase in the application of (very) high rates of N on oilseed rape.

¹Reference: MAFF (1993). 'Survey of oilseed rape production August 1993 – England'. Stats 187/93 Government Statistical Service, Guildford.

²Reference: MAFF (1994). 'Survey of oilseed rape production August 1994 – England'. Stats 199/94 Government Statistics Service, York.

Prior to 1994, overall N use on **sugar beet** had declined steadily over a number of years, reflecting increased farmer awareness, following promotional campaigns, about the adverse effect of excessive N input on sugar quality. In 1994, however, the total N rate increased by 12 kg/ha to 122 kg/ha, due to increases in both the straight and (especially) the compound N rates. This overall increase represented a return to levels reported during 1989 – 91, when the N rate had already declined substantially over previous years. This may reflect concerns about the risk of leaching losses from seedbed applied N on coarse textured soil types during the wet spring and increased rates of subsequent N top dressings to allow for any suspected losses.

Recent trends in the application of fertiliser N to **winter cereals** and **winter oilseed rape** during the August to January period are summarised in Figure B2.3. In 1994, the overall N rates increased slightly for all three crops due to increases in the percentage areas receiving N and, for winter barley, in the average field rate.

The Survey results show a general downward trend, between 1988 and 1993, in the overall application rate of N on all three crops during this first part of the cropping season, due in the main to a decline in the percentage of the crop area receiving any dressing of N. This trend for winter cereals is consistent with advice which farmers have received from ADAS and other sources within the industry for a number of years: in most situations, autumn N applications do not give economic yield responses for winter cereals and they also increase the potential for nitrate leaching during the winter period when growth is very limited and crops have little need for N. The average field rates of N, on those fields of winter cereal which did receive dressings of N, nevertheless, increased over this period of years. Seedbed N at 30 kg/ha is still recommended for winter oilseed rape unless the soil N fertility is high. The economic benefit is, however, small and, in practice, less than half of the crop area receives an autumn N dressing.

N usage on potatoes had shown a decline in recent years but recovered in 1994 to the level reported for 1989. This was the result of increased use of straight N and an increase in high rates of N application (Table B2.3).

P₂O₅ AND K₂O

There were no consistent changes in overall application rates of P₂O₅ and K₂O across the major tillage crops in 1994, with the exception of a decline in the overall usage of K₂O on **sugar beet**, down by 12 kg/ha.

Overall P₂O₅ rates decreased by 4 kg/ha on both **spring barley** and **oilseed rape** in 1994, both below the average reported for recent years. These changes were due to decreases in crop area receiving dressing rather than changes in the average field rate. P₂O₅ use on potatoes increased by 6 kg/ha in 1994, but this is still below the longer term usage, despite a recovery in the average field rate.

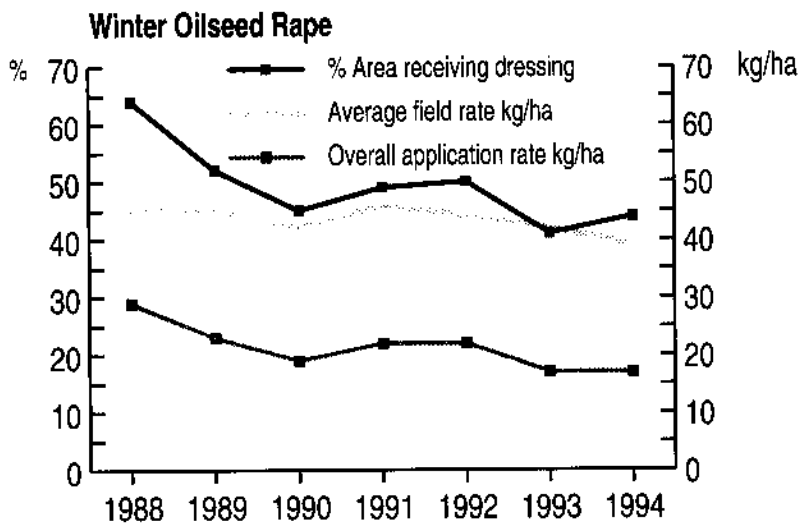
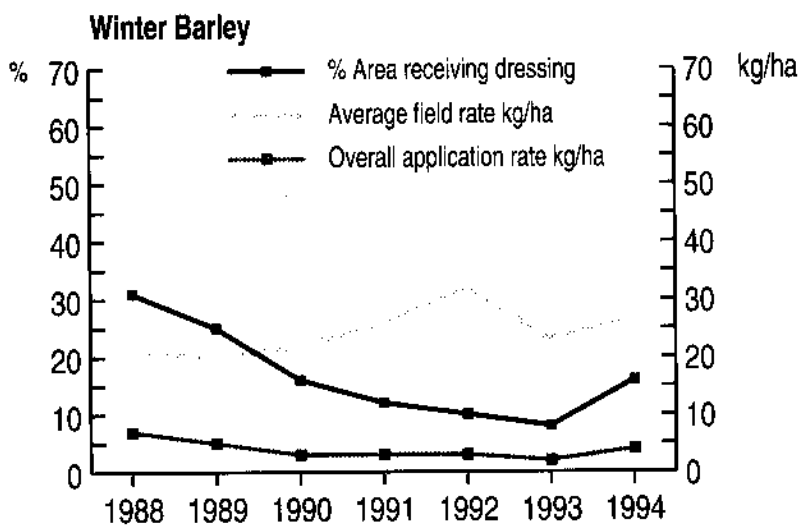
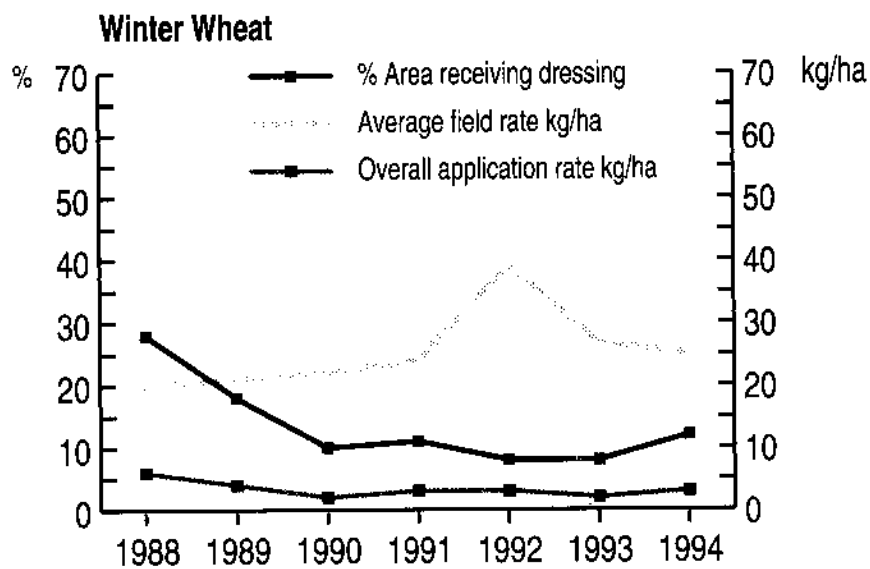
Overall use of K₂O in 1994 increased on **winter wheat**, on **winter barley** and on **oilseed rape**, with recoveries in the average field rates applied. Overall K₂O rate decreased slightly on **spring barley**, back to levels reported in recent years, as the percentage dressing cover fell. As reported above, the overall use of K₂O on **sugar beet** fell markedly, due to decreases in both dressing cover and average field rate.

Table B2.3 Distribution of field application rates of N on major tillage crops and grassland, England & Wales 1992 -1994 (as row %)

		0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	average rate	overall rate	000 ha*
Winter wheat	1992	1	•	•	1	2	3	10	43	34	3	1	1	187	184	1929
	1993	1	•	1	1	3	3	9	44	34	5	•	1	185	184	1530
	1994	1	•	•	3	4	3	8	42	32	6	•	1	186	185	1784
Spring barley	1992	2	2	8	23	29	17	13	5	1	•	•	•	90	88	196
	1993	4	1	6	13	36	21	13	4	1	•	•	•	94	90	242
	1994	2	1	4	11	32	23	18	8		•	•	•	103	101	219
Winter barley	1992	1	•	2	3	8	18	25	38	4	•	1	•	140	139	686
	1993	1	1	1	3	13	19	26	33	3	•	1	•	133	133	533
	1994	1	1	•	3	10	15	28	35	6	1	•	•	142	141	569
Maincrop potatoes	1992	6	•	•	1	1	4	12	36	29	7	2	1	193	181	65
	1993	3	1	•	2	4	2	4	30	41	9	2	1	203	197	85
	1994	1	1	1	2	5	8	4	27	24	23	7	•	202	201	99
Sugar beet	1992	6	•	5	7	12	13	38	15	1	•	2	•	122	115	183
	1993	4	1	6	7	13	17	37	14	•	•	•	•	115	110	194
	1994	4	1	8	8	13	12	34	13	1	4	2	1	127	122	237
Oilseed rape	1992	1	•	•	2	2	3	6	32	42	9	1	1	199	198	378
	1993	1	•	•	2	7	7	16	23	33	10	1	•	181	179	318
	1994	2	1	1	2	6	8	12	24	29	13	1	1	186	183	429
All tillage	1992	9	1	2	4	6	7	13	31	22	3	1	•	162	147	4224
	1993	12	1	3	4	10	8	12	28	18	3	1	•	155	137	3788
	1994	8	1	2	5	8	8	13	29	19	5	1	•	162	149	4056
All grass	1992	25	1	11	14	9	6	7	9	7	5	5	2	139	104	4091
	1993	20	•	10	14	12	6	9	10	7	5	5	1	140	112	4254
	1994	20	1	8	15	9	7	8	11	9	6	6	1	145	117	4197

*estimated area under crop

Figure B2.3 Application of N during the period August to January, England and Wales 1988-1994



SCOTLAND

No major changes occurred in fertiliser use on major tillage crops in Scotland during 1994, compared with estimated usage over the previous six years, apart from a decrease of 23 kg/ha N on oilseed rape. This substantial drop in the overall N rate on oilseed rape followed the previous reduction that occurred in 1992 due to the transitional Oilseeds Scheme, but no subsequent change in N rate in 1993 under the Arable Area Payment Scheme.

N

Winter wheat showed a small increase of 7 kg/ha in overall N rate, reverting to previous levels of the overall application rate, due to a significant increase in the use of compound N.

Overall N use on spring barley decreased, as less straight N, but more compound N, was applied than in 1993, a similar switch was also discernible for winter barley.

N use on oilseed rape dropped sharply in 1994, in contrast to England and Wales, brought about by a sharp fall (of 22 kg/ha) in the average field rate of straight N, confirming a decline in use over the period 1989 to 1994.

P₂O₅ AND K₂O

Overall application rates of both nutrients in 1994 were generally within the range of estimated values for each major tillage crop since 1989, apart from increases of 13 and 12 kg/ha in the P₂O₅ and K₂O rates on winter wheat. The recovery in K₂O rate from the 1993 low was associated with the increased use of compound N products; the average field rate for P₂O₅ and K₂O were particularly high in 1994. There were similar increases in P₂O₅ and K₂O on maincrop potatoes.

The K₂O rate on oilseed rape remained unchanged in 1994, confirming the drop below the average level for recent years. There was a recovery in the usage of P₂O₅ on this crop, apparently due to a recovery in the average field rate.

Annual estimates for a given nutrient and crop show larger variation than for equivalent England and Wales figures because of the smaller sample size.

Table B2.4 Distribution of field application rates of N on major tillage crops and grassland, Scotland 1992 - 1994 (as row %)

		0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	average rate	overall rate	000 ha*
Winter wheat	1992	2	•	1	1	2	2	3	35	49	5	•	1	200	197	216
	1993	1	•	•	1	2	4	4	36	45	8	•	•	194	193	207
	1994	•	2	•	•	5	1	4	28	48	11	1	•	201	200	104
Spring barley	1992	•	2	3	16	38	30	8	2	1	•	•	•	93	92	335
	1993	•	1	5	14	33	35	11	1	•	•	•	•	94	94	312
	1994	1	2	7	19	25	37	6	1	•	1	•	•	90	89	217
Winter barley	1992	•	•	•	1	4	5	34	36	16	•	3	•	165	165	98
	1993	2	•	•	•	3	4	14	55	21	1	•	•	172	172	63
	1994	2	3	2	•	2	9	15	36	31	•	•	•	170	166	48
Maincrop potatoes	1992	3	•	•	•	6	10	31	37	12	2	•	•	156	152	29
	1993	3	1	•	•	1	10	18	48	13	6	•	•	155	163	35
	1994	5	•	3	•	11	8	7	43	14	10	•	•	169	161	18
Oilseed rape	1992	•	•	1	3	5	13	4	26	23	18	6	•	189	189	90
	1993	•	•	•	8	5	15	11	9	31	20	1	•	182	182	94
	1994	•	1	4	10	8	14	10	19	20	10	3	•	159	159	84
All tillage	1992	4	1	3	10	18	14	10	18	17	4	1	•	129	125	+578
	1993	2	1	3	10	16	19	10	18	18	5	•	•	140	130	+815
	1994	2	3	5	12	17	19	7	14	15	4	1	•	131	128	567
All grass	1992	17	•	6	17	12	12	8	10	7	7	4	•	134	111	+1090
	1993	16	1	7	18	9	10	10	11	10	5	4	•	135	114	+1176
	1994	11	1	9	16	14	11	13	12	5	5	3	•	125	111	969

+ obtained directly from 1993 Agricultural Census

* estimated area under crop

Source: British Survey of Fertiliser Practice 1992, 1993, 1994

3 – Fertiliser use on grassland

GREAT BRITAIN

Total N use on grassland in Great Britain increased by 4 kg/ha in 1994 to 116 kg/ha (Table B1.1 – repeated below in summary form), the net result of a major increase in the use of compound N, and masking a fall in the use of straight N on grass. This seems to be associated, through the switch in 1994 to compound products, with increases (of 2 to 3 kg/ha) in the overall application rate of P₂O₅ and K₂O in 1994.

	Straight N	Compound N	Total N	Total P ₂ O ₅	Total K ₂ O
1992	51	55	106	22	28
1993	56	56	112	21	29
1994	51	65	116	24	31

Overall fertiliser rates for grass in England and Wales and in Scotland are summarised in Table B3.1, equivalent data for the percentage dressing cover and average field rates for N are shown in Tables B3.2 and B3.3 respectively.

Table B3.1 Overall fertiliser usage on grass 1988 – 1994 (kg/ha)

	Straight N		Compound N		Total N	
	E&W	Scot	E&W	Scot	E&W	Scot
1988	61	52	55	80	116	132
1989	70	36	57	81	127	111
1990	68	38	64	78	132	116
1991	69	36	64	75	133	111
1992	55	36	49	75	104	111
1993	63	33	49	81	112	114
1994	54	37	63	74	117	111

Table B3.2 Dressing cover on grassland 1990 – 1994 (%)

	Straight N		Compound N		Total N		Total P ₂ O ₅		Total K ₂ O		
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	
1990	50	35	63	76	1990	85	87	65	76	66	75
1991	49	34	60	75	1991	82	83	62	75	64	73
1992	41	31	59	69	1992	75	83	55	75	55	71
1993	48	32	55	75	1993	80	84	57	77	58	74
1994	41	37	63	76	1994	80	89	63	76	62	72

Table B3.3 Average field rates of N on grassland 1990 – 1994 (kg/ha)

	Straight N		Compound N		Total N	
	E&W	Scot	E&W	Scot	E&W	Scot
1990	136	111	101	102	155	134
1991	139	107	106	100	161	133
1992	133	116	93	109	139	134
1993	130	103	89	108	140	135
1994	133	100	100	98	145	125

ENGLAND AND WALES

There is clear evidence in Table B3.1 to confirm an upturn since 1992, with an increase, in 1994, of 5 kg/ha N in overall N use on grass; a partial recovery attributable to increased use of compound N. Even so, the estimated rate of 117 kg/ha N is still significantly below the pre-1992 average (about 130 kg/ha).

Total N use increased on grazed grass (by 3 kg/ha) and on grass cut for silage (by 10 kg/ha), but it decreased by 7 kg/ha on grass cut for hay. Overall rates of P₂O₅ and K₂O both increased by 4 kg/ha on all grass, due to increased application rates on grazed grass and fields cut for silage. The 1994 estimates suggest that the preceding, gradual decline in the use of these two nutrients on grass may have ended.

N

The recovery in 1994 in total N use on all grass (Table B3.1) was the net result of increased compound N use, with increases in both the dressing cover and the average field rate. This offset the drop in the overall rate of straight N that had resulted from a decrease in dressing cover. The net increase in total N rate can mostly be attributed to greater N use for grazing and silage cuts. However, the overall N rate of 117 kg/ha for 1994 remains well below the annual estimates prior to 1992, with the exception of 1988 when the reported rate was 116 kg/ha.

The main purposes for which grass is grown, expressed as percentages of the total grass area, are summarised in Table B3.4. The pattern of grazing and cutting regimes had remained similar over a long period but, in 1994, the proportion of grass reported to be used for grazing dropped markedly by 7% to 89%. This reflects a major decrease in combined cutting and grazing use with a reduction in the percentage of grass area recorded as used for both grazing and silage (from 32% to 23% – no table shown here) and an increase (from 3% to 11%) in the percentage of grass fields used only for silage. Consequently, the proportion cut for silage, whether or not grazed, was unchanged. There was only a 2% increase in the proportion cut for hay in 1994. One possibility is that the wet spring led to an overabundant supply of grass for grazing requirements, and that this resulted in a larger area than normal being taken for first cut silage.

Table B3.4 Grassland utilisation 1989 – 1994 (% of grass area)

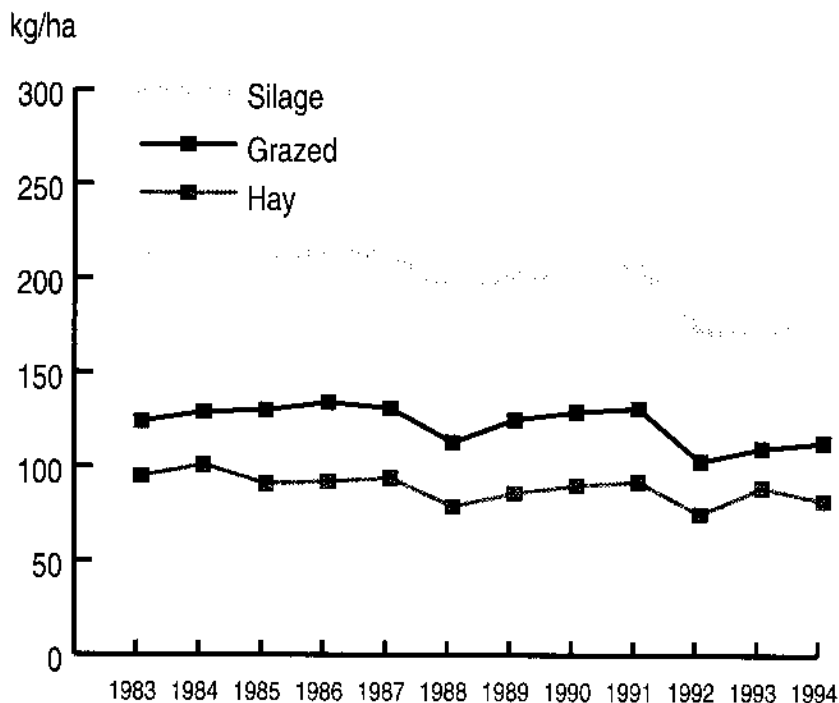
	PERCENTAGE OF GRASS AREA					
	Grazed ¹		Silage ²		Hay ²	
	E&W	Scot	E&W	Scot	E&W	Scot
1989	97	98	28	22	12	9
1990	97	99	31	24	11	8
1991	97	99	29	22	12	9
1992	94	98	28	23	12	9
1993	96	98	29	27	12	8
1994	89	80	29	25	14	7

Overall and average field rates of fertiliser vary according to grass utilisation, as shown in Table B3.5, with higher rates on grass cut for silage. The overall N rates for grazed and cut grass for the period 1983-1994 are displayed in Figure B3.1.

¹May also be cut

²May also be grazed.

Figure B3.1 Nitrogen use by grass utilisation, England and Wales 1983 – 1994



N usage on grass for grazing or hay cuts shows no definite pattern but the gradual long-term decline of N use on silage would seem to be coming to an end. The 1994 overall and field-specific rates of applied N on grass cut for silage remain below the pre-1992 rates, however (Table B3.5).

The continued recovery in overall N use on grass in 1994 was partly due to the increase of 3 kg/ha on **grazed** grass, although the total rate of 113 kg/ha N is still about 17 kg/ha below estimated usage in 1990 and 1991 (Table B3.1). The small increase in 1994 was largely the result of increased dressing cover, rather than any change in average field rate.

The recovery in N use on all grass was also due, in part, to the rise in overall N use on **silage**, which increased by 10 kg/ha in 1994 to 180 kg/ha, following the lower levels obtained in 1992 and 1993. The average field rate of application was also up in 1994, but both overall and average field rates remain below the pre-1992 estimates. The proportion of grass that was cut for silage in 1994 was, at 29%, the same as in 1993.

Good growing conditions for high yields at first and second cuts were followed by a prolonged period of dry weather in many areas, when grass growth was limited, and the seasonal weather pattern would have influenced N usage in 1994 on both cut and grazed grassland. Changes in the type and pattern of livestock production may also be a contributory factor in some years.

The percentage of grass cut for hay increased from 12% to 14% in 1994, but the overall N use on hay dropped by 7 kg/ha to 82 kg/ha, mainly as a result of a decrease in the dressing cover.

P₂O₅ AND K₂O

Recent trends in overall rates of P₂O₅ and K₂O on **all grass** suggest a recovery in the use of these nutrients, following the sharp decline in 1992, due to recovery in the dressing covers in 1994 (Table B3.2).

Overall rates of both P₂O₅ and K₂O increased by 3 to 4 kg/ha on **grazed** grass and by 7 to 8 kg/ha on grass cut for **silage** in 1994, following the previous drop in application rates of these nutrients (Table B3.5). Application rates were unchanged on grass cut for **hay**.

Table B3.5 Fertiliser application rate by grass utilisation 1989 – 1994

TOTAL N (kg/ha)												
Overall application rate							Average field rate					
grazed ¹		silage ²		hay ²			grazed ¹		silage ²		hay ²	
E&W	Scot	E&W	Scot	E&W	Scot		E&W	Scot	E&W	Scot	E&W	Scot
125	88	202	177	86	108	1989	148	103	221	177	100	109
129	89	199	182	90	104	1990	152	111	213	183	103	108
131	87	207	196	92	83	1991	159	112	229	196	104	98
103	109	172	205	75	108	1992	136	107	185	210	105	114
110	114	170	188	89	100	1993	139	134	178	190	110	107
113	100	180	174	82	101	1994	140	114	189	177	108	110

TOTAL P ₂ O ₅ (kg/ha)												
Overall application rate							Average field rate					
grazed ¹		silage ²		hay ²			grazed ¹		silage ²		hay ²	
E&W	Scot	E&W	Scot	E&W	Scot		E&W	Scot	E&W	Scot	E&W	Scot
22	25	34	42	20	37	1989	34	34	44	46	31	43
23	20	33	44	22	33	1990	36	30	42	47	35	38
22	17	33	46	22	25	1991	36	24	44	49	34	33
18	30	30	48	16	32	1992	33	35	41	54	31	38
18	28	28	46	18	33	1993	32	36	40	49	34	37
22	25	36	47	18	31	1994	35	34	45	53	32	39

TOTAL K ₂ O (kg/ha)												
Overall application rate							Average field rate					
grazed ¹		silage ²		hay ²			grazed ¹		silage ²		hay ²	
E&W	Scot	E&W	Scot	E&W	Scot		E&W	Scot	E&W	Scot	E&W	Scot
21	22	70	73	26	42	1989	51	31	88	79	39	49
34	20	68	69	26	39	1990	53	31	84	72	40	44
35	17	74	74	28	29	1991	54	26	91	77	42	38
25	33	54	70	20	42	1992	45	32	69	77	39	42
26	33	54	71	22	35	1993	46	45	70	76	41	40
29	25	61	61	22	36	1994	47	36	75	71	39	45

¹ may also be cut

² may also be grazed

SCOTLAND

Total N use on all grass in 1994 was 111 kg/ha, back down to the same level as estimated in 1991 and 1992. This apparent drop was associated with significantly lower use of compound N in 1994 than in 1993, and with lower overall use of N on grazing and silage cuts. Overall P_2O_5 use showed little change from 1993, whereas K_2O use decreased by 4 kg/ha (Table B1.2) on all grass with a 10kg/ha drop in the overall application rate for silage. However, there do not appear to be any longer term trends for P_2O_5 and K_2O .

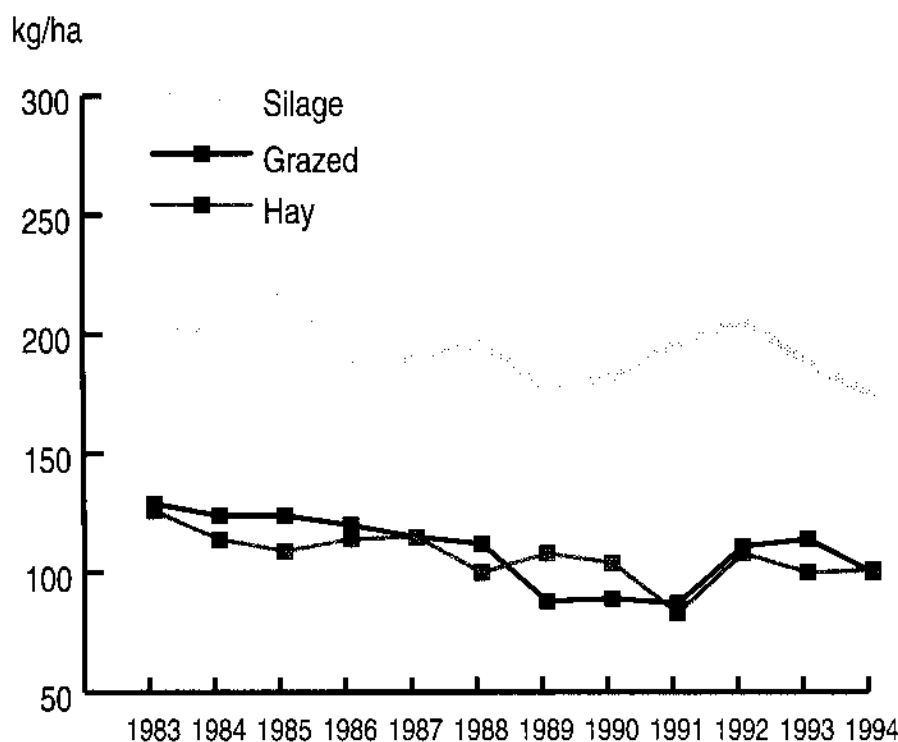
In general, Scotland's farmers report more overall use of compound NPK products than do farmers in England and Wales, who make more use of straight N products. However, in 1994 there was a fall in average field rates, especially of compound N on grass and therefore total N.

N

Total N use decreased by 3 kg/ha to 111 kg/ha for all grass in 1994, as a net result of a 7 kg/ha drop in the overall compound N rate offset by a 4 kg/ha increase for straight N. The estimates for the overall rates of application of N on grass indicate levels similar to 1991 and 1992. The rates of compound N and total N reported in 1993 were unusually high, and that for straight N was unusually low. The change in compound N was outside the bounds of sample variation. In practice, there is little to suggest drastic change over recent years in total N use on grass, since the annual changes could be considered as random fluctuation about an unchanged average (Table B3.1). This variation reflects annual fluctuations in overall rates of straight and compound N, and here there is some evidence of increasing dressing covers (Table B3.2) and decreasing average field rates (Table B3.3).

Slightly less grass was reported as being cut for silage or hay than in 1993, the proportion of grazed grassland was, however, significantly less than in previous years (Table B3.4).

Figure B3.2 Nitrogen use by grass utilisation, Scotland 1983 - 1994



Overall total N use on grazed grass dropped by 14 kg/ha to 100 kg/ha (Table B3.5), towards the lower, pre-1992 rates which suggests that the 1993 estimate may have been high. A drop of 14 kg/ha in the total N rate on silage in 1994 is evident, due to a decrease in average field rate and part of a general decline over time (Figure B3.2). There was little evidence of any change in the total N rate on hay.

P₂O₅ AND K₂O

The estimates and standard errors for overall use of K₂O on **all grass** (Table B1.2 and Table C4) indicate a significant drop of 4 kg/ha in 1994. This was associated with evidence of a decrease in the overall and average field application rates of K₂O on grass used for **grazing** or **cut for silage** (Table B3.5). The 1994 estimates for **grazed grass** were, however, within the range of estimates for the period since 1989.

No significant changes in P₂O₅ use in 1994 are evident.

The longer term trends also show relatively static levels of P₂O₅ and K₂O use (Table B3.5).

SECTION C – SURVEY METHODOLOGY AND SAMPLING VARIATION

The British Survey of Fertiliser Practice has a nationally representative sampling design resulting in high precision estimates. Although 'random' sampling is involved, the design used leads to estimates that are more precise than those which would have been obtained by a 'simple random sampling' of farms. The design is similar to that used by Rothamsted Experimental Station for the pre-1992 Surveys.

Table C1: Sampling Characteristics of British Survey of Fertiliser Practice 1994

	farm holdings in population in 1993	total crops & grass in 1993	notional sampling fraction	target sample size	achieved sample size	achieved sample fraction
	column					
ENGLAND & WALES	%	%				%
Livestock						
(MAFF groups 1 – 7)						
<i>crops & grass area 20-50 ha</i>	18950	8.3	0.5	99	99	0.5
<i>51-100 ha</i>	21029	18.2	1.0	216	211	1.0
<i>101-200 ha</i>	9492	15.5	1.9	182	173	1.8
<i>200+ ha</i>	2359	8.9	4.3	101	92	3.8
Crops & mixed						
(MAFF groups 8+9+13)						
<i>crops & grass area 20-50 ha</i>	2155	1.0	0.5	11	10	0.5
<i>51-100 ha</i>	5128	4.7	1.1	56	56	1.1
<i>101-200 ha</i>	6384	11.0	2.0	131	128	2.0
<i>200+ ha</i>	4101	17.9	5.1	208	188	4.5
Fruit, horticulture & veg.						
(MAFF groups 10+11+12)						
<i>crops & grass area 20-50 ha</i>	1394	0.5	0.9*	12	12	0.9
<i>51-100 ha</i>	698	0.6	1.9*	13	13	1.9
<i>101-200 ha</i>	370	0.6	3.0*	11	11	3.0
<i>200+ ha</i>	231	1.1	9.1*	21	18	7.8
			*double sampling			
Part-time						
(MAFF group 14)						
<i>crops & grass area 20-50 ha</i>	21095	7.9	0.4	94	90	0.4
<i>51-100 ha</i>	4180	3.3	0.9	38	35	0.8
<i>101-200 ha</i>	305	0.5	0.7	2	2	0.7
<i>200+ ha</i>	11	0.02	–	0	0	–
Total for England and Wales	97882	100%		1195	1138	
NB Farm holdings predominantly engaged in the production of fruit, vegetables and general horticulture were deliberately oversampled in order to provide sufficient precision in estimation of fertiliser dressings on such crops.						
SCOTLAND						
Cereal/gen. cropping/hort.						
(SOAFD 'robust' groups 1 – 3)						
<i>crops & grass area 20-50 ha</i>	1161	2.6	0.6	7	7	0.6
<i>51-100 ha</i>	1494	7.2	1.2	18	16	1.0
<i>101-200 ha</i>	1342	12.5	2.3	31	29	2.0
<i>200+ ha</i>	577	11.9	5.1	30	27	4.6
Livestock & mixed						
(SOAFD 'robust' groups 4 – 8)						
<i>crops & grass area 20-50 ha</i>	3795	8.7	0.6	22	22	0.6
<i>51-100 ha</i>	4218	20.1	1.2	50	47	1.1
<i>101-200 ha</i>	2589	23.4	2.2	58	59	2.3
<i>200+ ha</i>	721	13.6	4.7	34	31	4.3
Total for Scotland	15897	100%		250	238	

As in past years, farms with less than 20 hectares of crops and grass were excluded from the survey; the remainder were stratified according to four size groups and four farm types in order to reflect the variability in fertiliser practice across Britain. This produced sixteen stratification cells for England and Wales and eight stratification cells for Scotland. The fraction of farm holdings sampled from within each cell varied in proportion to the total area of crops and grass so that the larger farm areas were well represented in the survey sample: a 'variable fraction stratification' scheme which is set out above.

The farm holdings within each cell were ordered according to the 'parish-holding number' to allow a high degree of implicit geographic stratification in the final 'systematic' selection of farms to the sample by MAFF and SOAFD. Overall, 1,376 farms were successfully surveyed, an achieved 'sampling fraction' of 1.2% of farms (Table C2).

Table C2: Summary Sampling Characteristics 1994

	farm holdings in population in 1992	total crops & grass in 1992 (million hectare)	target sample size	achieved sample size	achieved sampling fraction (%)
England & Wales	97,882	8.2	1,195	1,138	1.2
Scotland	15,897	1.5	250	238	1.5
Great Britain	113,779	9.7	1,445	1,376	1.2

Note that the farms were stratified according to information collected in the 1993 Agricultural Census. Results from the Survey were 'weighted' using the inverse of the achieved sampling fraction for the appropriate stratification cell.

ACHIEVED SAMPLE

Some non-response is inevitable in all voluntary sample surveys. Consequently, not all the 1,445 farms in the target sample for the 1994 Survey were successfully surveyed: some were found, on inspection, to be farms that should have been excluded from the Survey (invalid), in some instances the interviewers were unable to make contact with the farm managers, and some farmers refused to take part in the survey. Overall, returns were obtained for 1,376 farms: 1,143 of these responses were from the 'main' sample and 233 responses were from a 'reserve' sample. The reserve sample was constructed by selecting, within each stratification cell, the farm having the next (adjacent) 'county-parish-holding number' to each member of the main sample, enhancing the extent of similarity and exchangeability. The use of a reserve sample, adopted in previous surveys, is a strategy designed to counter the threat of bias from the non-response to the main sample; any over-sampling created thereby is discounted subsequently through the use of sampling weights. The use of a reserve sample also means that there can be no one simple 'response rate', although the net response rate (excluding the farms discovered to be invalid) to the main sample, which was 81% in 1994, is the most appropriate for comparison with previous years and with other surveys. In 1994, this procedure was complicated slightly by the use of 26 'unmatched' farms from the Reserve sample to act as a 'boost', in order to compensate for the higher non-response.

Table C3: Response to Main and Reserve Samples (including 'boost farms')

issued from Main Sample	1445		1994	1993
			%	%
response to Main Sample	1143		crude response rate 79.1	83.9
non-response	302	of which 33 invalid	net response rate 80.9	86.3
issued from Reserve Sample	302			
response to Reserve Sample	207		crude response rate 68.5	83.8
non-response	95	of which 9 invalid	net response rate 70.6	85.2
'boost' farms returned	26			
achieved sample size	1376		achieved rate 95.2	97.4

Response rates were lower for the 1994 BSFP than they were for the 1993 BSFP (Table C3), over 5% lower for the main sample and nearly 15% lower for the reserve sample. The effect of any possible bias arising from the increased non-response may have been lessened by using a 'boost' sample (of 26 farms 'similar' in characteristics) in addition to the 'reserve' sample and the implicit post-stratification in the estimation procedure, which uses the balance of farm type and farm size in the target sample. Nevertheless, this change in the non-response rate may explain some of the differences in the 1993 and 1994 estimates.

Table C4: Analysis of non-response 1992-1994

	1992	1993	1994
a) net response rate			
main sample	87%	86%	81%
reserve sample	89%	85%	71%
'overall' achieved rate (inc. 1994 'boost')	88%	86%	80%
b) refusal rate	9.6%	11.3%	16.5%
main reasons for refusal	%	%	%
too busy	31.3	34.2	38.1
not interested	22.1	11.2	21.1
don't do surveys	14.1	9.2	9.4
want payment	12.3	4.6	4.5
too much paperwork (IACS)	–	19.9	6.8
c) non-contact rate	2.5%	2.6%	4.0%

SAMPLING VARIATION

Survey results can only be estimates and subject to a degree of sampling variation. Ideally, estimates from a survey would be both unbiased and reliable. Cross-checks with sources outside the survey and rigorous attention to survey practice help ensure a lack of bias. Reliability is easier to assess. Reliability corresponds to the extent that the results obtained from the selected sample are similar to the results that would have been obtained had the sampling scheme provided a different set of farms to survey – a notion that justifies all random sampling. An indication of the reliability of a survey estimate is given by its 'standard error'.

Table C5 Standard errors for application rates for the major crops in 1994

ENGLAND & WALES											
	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total	str't	comp	total	total	total	str't	comp	total	total	
	N	N	N	P ₂ O ₅	K ₂ O	N	N	N	P ₂ O ₅	K ₂ O	
<i>Winter wheat</i>	2.8	2.8	0.1	0.6	0.5	2.7	2.4	0.3	0.5	0.4	3100
<i>Oilseed rape</i>	0.6	0.7	0.9	0.5	0.5	0.7	0.7	2.3	0.8	0.5	813
<i>Winter barley</i>	0.8	0.6	0.7	0.5	1.4	0.6	1.0	2.4	1.1	1.6	1038
<i>Spring barley</i>	0.3	0.2	0.3	0.6	0.8	0.6	0.7	1.5	1.2	1.1	476
<i>M C potatoes</i>	2.0	4.2	3.7	3.8	7.7	1.9	3.3	2.4	2.3	4.6	253
<i>Sugar beet</i>	3.7	3.2	0.8	2.2	2.1	4.2	3.1	3.6	2.3	4.2	483
<i>All tillage crops</i>	1.2	1.2	0.1	0.6	0.3	1.3	1.2	0.6	0.6	0.3	7848
<i>All grass</i>	2.9	1.7	1.3	0.4	0.5	2.8	2.4	1.7	0.4	0.7	4284

SCOTLAND											
	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total	str't	comp	total	total	total	str't	comp	total	total	
	N	N	N	P ₂ O ₅	K ₂ O	N	N	N	P ₂ O ₅	K ₂ O	
<i>Winter wheat</i>	3.3	3.8	0.9	0.3	1.3	3	3.2	0.9	0.8	1.7	244
<i>Oilseed rape</i>	5.7	5.6	0.7	2.6	2.5	5.8	2.5	1.0	2.8	2.8	156
<i>Winter barley</i>	5.3	8.1	3.2	4.6	0.6	4.9	4.3	4.3	4	0.7	118
<i>Spring barley</i>	0.7	0.2	0.5	0.9	1.0	0.3	0.9	0.4	0.7	0.8	490
<i>M C potatoes</i>	3.9	0.4	3.6	1.9	6.0	5.6		5.3	1.9	2.6	38
<i>All tillage crops</i>	1.4	0.9	0.8	0.6	1.2	1.4	1.2	0.6	0.7	1.3	1266
<i>All grass</i>	1.4	2.4	1.1	0.3	0.1	1.8	2.5	1.4	0.5	0.6	1653

The size of the 'standard error' is influenced by several factors, some of which vary across years. Changes in sample design have been kept to a minimum, although, in 1994, the stratification for Scotland was improved. The number of farms in the sample was reduced for England and Wales.

Changes in the variability of application rates across farms in Britain, and therefore in the sample, also have an effect on the precision of sample survey results. This is especially critical for the precision of the overall application rates wherever there is change in the percentage of fields being dressed with fertiliser, or when there are marked changes in the very high or very low rates of application on fields in a farm.

When estimates are large relative to their standard error, this indicates reliability; standard errors which are relatively large show up poorly determined survey estimates. This is especially important for estimates of application rates for specialised crops as these are based upon only a small number of fields: the corresponding standard errors tend to be larger the fewer the number of fields, indicating less precision. But by itself, the number of fields in the sample growing a particular crop is only a rough guide to the size of the standard error. The sizes of standard errors for the application rates in the Survey actually depend upon the number of farms and fields in the sample, the sampling fraction, the variability in application rates across Britain's farms and upon the combined effectiveness of the sampling design and estimation methods. Note, for example, that the standard errors for estimates of application rates in Scotland are not very much larger than those for England and Wales, despite smaller sample size.

The use of standard errors is best illustrated through examples. In 1994, in England and Wales, the estimated overall application rate of total nitrogen use on winter barley was 142 kg/ha. The low value of the corresponding standard error of 0.8 kg/ha, relative to the 142 kg/ha indicates very high reliability (good precision), a 'relative error' near to 0.56% (the ratio 0.8 to 142, as percentage). However, the application of Nitrogen on sugar beet provides another example with less, but also good, precision: the estimated overall application rate was 122 kg/ha, with a corresponding standard error of 3.7 kg/ha, a 'relative error' of 3.0%. The application of N on kale and cow cabbage is estimated with much less precision: 68 kg/ha with a corresponding standard error of 7.2 kg/ha, with a much larger 'relative error' of 10.6% – due, in part, to the small number (21) of fields of kale and cow cabbage represented in the Survey.

Another way of expressing the reliability is to construct a 95% Confidence Interval. This is derived by creating a lower and upper bound, of length 2 times the standard error, about the survey estimate. The example for winter barley N would have a narrower Confidence Interval: with lower bound 140.4 ($142 - 2 \times 0.8$) and an upper bound of 143.6 ($142 + 2 \times 0.8$). On 95% of occasions such an interval will enclose the 'true value'; this gives confidence to believe that the true value lies in that narrow range. The comparable 95% Confidence Interval for the overall application rate of N on kale and cow cabbage would be much wider.

ASSESSING ESTIMATES OF CHANGE

This same approach can be adopted to assess the statistical significance of an apparent change over time in a given dressing-crop application rate. Sometimes, differences observed between years should be attributed to sampling variation. The rule of thumb is to take note of differences only when they are nearly three or more times the size of the standard error of one year's estimate.

For example, the overall application rate of P_2O_5 on sugar beet in 1994 was estimated at 55 kg/ha, an apparent increase from 51 kg/ha in 1993. The difference is 4 kg/ha. The standard error in 1994 was 0.5 kg/ha. The observed difference of 4 kg/ha is greater than 3 times 0.5 (= 1.5) kg/ha and therefore is not be attributable to sampling variation alone – providing greater evidence of real world change.

Strictly, the standard error of the difference between survey estimates obtained from two independent samples is the square root of the sum of the squared standard errors for each of the two estimates. This applies to the comparison across two or more years. (And so, the rule of thumb for statistical significance of differences is equivalent to twice the standard error of the difference.) The approximation used above, only taking note of differences greater than three times standard error (of a point estimate), assumes that the standard error of each estimate was the same. Inevitably there will be some variation in the standard error estimate each year, even if the sampling design has remained the same. For example, in 1993 the standard error for P_2O_5 on oilseed rape was reported as 1.1, providing a standard error for the between year difference of 1.2 (square root of $0.52+1.12$): the observed difference of 4kg/ha is still greater than twice this standard error of the difference.

ESTIMATING THE STANDARD ERROR

The procedure required to obtain correct standard errors for a complex survey design is not straightforward. The 'classical' approach to estimating standard errors from such a complex survey design is to use complex formulae, appropriate to each statistic of interest, from the standard texts. With sufficient farms and fields in the sample, statistical theory provides methods to assess the reliability of estimates using the variability in the sample and knowledge of the sampling scheme used – the explicit stratification and clustering described above. This approach, in part developed at Rothamsted Experimental Station¹, and used for earlier (pre-1992) surveys has an advantage in terms of precision of standard error estimation, but it may be regarded as having unwanted bias, in that it fails to measure

¹ Yates, F (1981) *Sampling Methods for Censuses and Surveys* (4th Edition) London: Charles Griffin

the gain in precision (reliability) obtained from the implicit stratification in the systematic selection. It also fails to measure sources of non-sampling variation. Moreover, it is computationally complex and difficult to extend to a wide variety of estimators.

The approach taken for the British Survey of Fertiliser Practice post-1992 was to build replication into the sampling design and use approximate sampling variance estimation to derive the standard errors. The simplest method of replication, the one adopted for the 1994 Survey for operational purposes, is to select two half-samples, each using exactly the same sampling scheme. The survey estimates are computed twice, once for each half sample. Calculation of the standard error is based on the difference between the values obtained in each half sample. This approach has the advantage that it takes account of the gain in reliability from the implicit stratification in the systematic selection (from the geographically ordered list). It is also computationally simple and applicable to a wide variety of survey statistics. The principal disadvantage of this approach is loss of precision in the estimated standard errors; although on average the standard errors are small and a good guide to the reliability of the survey results, one or more of the standard errors reported may occasionally under- (or over-) estimate. The extent of this drawback can be reduced by increasing the number of replicates used. This was in effect what was done, post-survey, by systematically sub-dividing the two design replicates to produce four working replicates. The formula used to derive the standard errors reported here makes use of the variation across these four working replicates.

We believe our approach in estimating standard error is appropriate and cost-effective. As with the reliability of the survey estimate of application rates, it is possible to devote more resources to the estimate of more accurate measure of the standard error but just how much should be spent on this is a matter of judgement for a general survey report. Surveys always represent a compromise between cost, quality and timeliness, the mix chosen dependant on priority of purpose.

SECTION D

CONTENTS

The numbering of these tables corresponds to the numbering used in the 1992 and 1993 BSFP Reports

GB TABLES 1994

- GB 1.1 Total fertiliser use in Britain
- GB 1.2 Use of straight fertiliser in Britain
- GB 1.3 Use of compound fertiliser in Britain
- GB 1.4 Use of lime in Britain
- GB 3.0 Product and nutrient use in Britain by month of application

ENGLAND AND WALES TABLES 1994

- EW 1.1 Total fertiliser use in England and Wales
- EW 1.2 Use of straight fertiliser in England and Wales
- EW 1.3 Use of compound fertiliser in England and Wales
- EW 1.4 Use of lime in England and Wales
- EW 1.5 Percentage of crop area by field application rate – N
- EW 1.6 Percentage of crop area by field application rate – P_2O_5
- EW 1.7 Percentage of crop area by field application rate – K_2O
- EW 2.1 Average fertiliser practice by grassland utilisation
- EW 2.2 Percentage of grass area by field application rate – N
- EW 2.3 Percentage of grass area by field application rate – P_2O_5
- EW 2.4 Percentage of grass area by field application rate – K_2O
- EW 3.0 Product and nutrient use in England and Wales by month of application
- EW 5.1 Average fertiliser practice on dairy farms in England and Wales
- EW 5.2 Average fertiliser practice on cattle & sheep farms in England and Wales
- EW 5.3 Average fertiliser practice on other livestock/mixed farms in England and Wales
- EW 5.4 Average fertiliser practice on cropping/horticultural farms in England and Wales
- EW 5.5 Average fertiliser practice on part-time farms in England and Wales

SCOTLAND TABLES 1994

- SC 1.1 Total fertiliser use in Scotland
- SC 1.2 Use of straight fertiliser in Scotland
- SC 1.3 Use of compound fertiliser in Scotland
- SC 1.4 Use of lime in Scotland
- SC 1.5 Percentage of crop area by field application rate – N
- SC 1.6 Percentage of crop area by field application rate – P_2O_5
- SC 1.7 Percentage of crop area by field application rate – K_2O
- SC 2.1 Average fertiliser practice by grassland utilisation
- SC 2.2 Percentage of grass area by field application rate – N
- SC 2.3 Percentage of grass area by field application rate – P_2O_5
- SC 2.4 Percentage of grass area by field application rate – K_2O
- SC 3.0 Product and nutrient use in Scotland by month of application
- SC 5.1 Average fertiliser practice on general cropping farms
- SC 5.2 Average fertiliser practice on dairy farms in Scotland
- SC 5.3 Average fertiliser practice on mixed farms in Scotland
- SC 5.4 Average fertiliser practice on farms in less favoured areas

Table GB1.1 Total fertiliser use in Britain 1994

	Ha.* (*000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	99	45	48	9	161	58	62	159	26	30	131
Winter wheat	1888	99	75	73	11	187	68	73	186	52	53	3344
Spring barley	436	98	86	88	28	96	49	59	95	42	52	966
Winter barley	618	99	79	82	15	144	66	76	143	52	62	1156
Oats	107	98	82	87	15	103	56	68	100	46	59	247
Rye	18	100	60	66	1	145	54	57	145	32	37	42
Early potatoes	25	99	100	100	48	190	188	237	188	188	237	71
Maincrop potatoes	117	98	93	94	35	197	208	270	194	194	254	291
Sugar beet	237	96	71	88	33	127	80	144	122	57	127	483
Oilseed rape	513	99	77	74	11	182	65	70	179	50	52	969
Linseed	90	88	50	42	6	69	51	56	61	26	23	165
Forage maize	37	97	84	71	89	84	56	61	81	47	43	71
Turnips (stock)	28	94	91	91	54	72	114	100	68	105	91	95
Kale and cow cabbage	11	79	72	71	57	92	45	49	72	32	35	32
Other roots/green crops	18	94	96	96	39	100	91	106	94	88	102	57
Peas	107	12	50	50	8	28	67	81	3	33	41	252
Beans	139	8	42	44	5	63	66	72	5	28	32	285
Vegetables (brassicae)	25	97	89	89	15	164	100	164	160	89	146	90
Vegetables (other)	19	88	83	91	20	128	86	147	113	71	133	73
Small fruit	8	97	48	81	2	63	56	133	62	27	108	44
Top fruit	26	87	56	65	0	79	41	31	69	23	20	52
Other tillage	94	73	68	57	62	83	61	83	61	42	47	198
All tillage	4619	93	75	75	17	158	71	84	147	53	63	9114
Grass under 5 years	1325	92	76	76	46	173	45	66	159	34	50	1970
Grass 5 years and over	3841	79	61	60	41	128	34	41	101	21	24	3967
All grass	5166	82	65	64	42	141	37	48	116	24	31	5937
All crops & grass	9785	87	70	69	30	150	54	67	130	38	46	15051

*Estimated area under crop

Table GB1.2 Use of 'straight' fertiliser in Britain 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	96	2	3	142	69	88	137	1	3	131
Winter wheat	1888	97	6	6	175	77	93	170	5	5	3344
Spring barley	436	57	1	3	78	84	99	45	1	2	966
Winter barley	618	93	4	6	134	73	100	125	3	6	1156
Oats	107	64	1	4	104	51	122	67	•	5	247
Rye	18	99	1	•	125	132	•	124	2	•	42
Early potatoes	25	13	1	2	70	98	203	9	1	5	71
Maincrop potatoes	117	34	3	11	123	188	208	42	6	23	291
Sugar beet	237	85	4	25	108	107	130	92	4	33	483
Oilseed rape	513	92	5	7	169	67	88	156	4	6	969
Linseed	90	71	9	1	65	57	34	47	5	•	165
Forage maize	37	51	4	4	91	85	88	46	3	4	71
Turnips (stock)	28	4	2	•	82	152	•	3	3	•	95
Kale and cow cabbage	11	23	•	•	68	•	•	16	•	•	32
Other roots/green crops	18	14	2	2	110	376	300	16	9	5	57
Peas	107	1	5	5	89	83	107	1	4	6	252
Beans	139	2	7	9	126	76	92	2	5	8	285
Vegetables (brassicae)	25	67	•	5	123	•	91	83	•	5	90
Vegetables (other)	19	45	1	7	103	75	134	46	1	10	73
Small fruit	8	56	•	32	59	•	155	33	•	50	44
Top fruit	26	68	5	4	59	42	75	40	2	3	52
Other tillage	94	36	3	7	94	86	91	33	3	6	198
All tillage	4619	80	5	7	151	79	107	120	4	7	9114
Grass under 5 years	1325	50	2	2	140	92	91	71	2	2	1970
Grass 5 years and over	3841	37	1	1	121	76	96	44	1	1	3967
All grass	5166	40	1	1	127	82	94	51	1	1	5937
All crops & grass	9785	59	3	4	142	79	105	84	2	4	15051

*Estimated area under crop

Table GB1.3 Use of compound fertiliser in Britain 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	33	43	44	66	58	60	22	25	26	131
Winter wheat	1888	35	70	68	44	67	71	15	47	48	3344
Spring barley	436	76	86	86	66	49	58	50	42	50	966
Winter barley	618	40	76	77	45	65	74	18	49	57	1156
Oats	107	57	82	83	59	56	65	34	45	54	247
Rye	18	37	59	66	59	52	57	22	30	37	42
Early potatoes	25	96	100	100	186	187	232	179	187	232	71
Maincrop potatoes	117	88	90	88	173	209	261	152	187	231	291
Sugar beet	237	35	68	71	86	77	131	30	52	94	483
Oilseed rape	513	50	72	68	46	64	68	23	46	46	969
Linseed	90	29	41	40	48	50	57	14	21	23	165
Forage maize	37	65	80	69	54	55	57	35	44	39	71
Turnips (stock)	28	90	91	91	72	111	100	65	101	91	95
Kale and cow cabbage	11	68	72	71	83	45	49	56	32	35	32
Other roots/green crops	18	89	94	94	88	84	103	78	79	97	57
Peas	107	11	45	45	24	64	78	3	29	35	252
Beans	139	6	35	35	40	63	66	3	22	23	285
Vegetables (brassicae)	25	81	89	89	95	100	159	77	89	141	90
Vegetables (other)	19	73	82	87	92	86	142	67	70	123	73
Small fruit	8	42	48	50	68	56	115	29	27	58	44
Top fruit	26	61	51	65	48	41	27	29	21	18	52
Other tillage	94	50	64	52	55	60	79	27	39	41	198
All tillage	4619	43	71	70	61	70	81	26	49	56	9114
Grass under 5 years	1325	74	75	75	119	43	64	88	32	48	1970
Grass 5 years and over	3841	62	61	59	92	33	40	57	20	24	3967
All grass	5166	65	65	63	100	36	47	65	23	30	5937
All crops & grass	9785	55	67	66	85	53	64	47	36	42	15051

*Estimated area under crop

Table GB1.4 Use of lime in Britain, 1994

	Crop area receiving dressing (%)					Average field rate of CaO equivalent (tonnes/ha)						Fields in sample	
	ground limestone	ground chalk	magnesian limestone	sugar beet lime	other	all	ground limestone	ground chalk	magnesian limestone	sugar beet lime	other		all
Spring wheat	4.5	2.6	2.7			10.5	2.8	2.7	2.1			2.4	131
Winter wheat	3.2	1.5	1.1	0.1	0.2	6.1	3.2	2.7	2.1	6.3	2.6	2.9	3343
Spring barley	6.9	0.6	5.2	0.2	0.7	14.0	2.3	2.7	3.5	2.6	8.1	3.0	966
Winter barley	7.7	1.5	2.8		0.1	12.6	2.8	3.9	2.5		1.5	2.7	1156
Oats	9.5		4.5	0.1		14.1	2.1		2.1	2.6		2.1	247
Rye			0.9			0.9			3.0			3.0	42
Early potatoes	5.8					5.6	2.2					2.2	71
Maincrop potatoes	0.3		0.8			1.0	2.1		2.4			2.3	291
Sugar beet	7.9	7.0	7.9	5.5	0.2	29.3	2.3	2.5	2.3	4.2	2.7	2.7	483
Oilseed rape	7.6	3.2	4.0	0.1		15.0	2.6	2.7	1.0	3.8		2.4	969
Linseed		0.2		0.3		0.5		1.0		2.6		2.0	165
Forage maize	8.5	1.9	5.4			15.9	2.3	0.6	2.9			2.3	71
Turnips (stock)	3.9		10.6			14.8	2.6		2.6			2.5	95
Kale and cow cabbage	0.9					0.9	2.7					2.7	32
Other roots/green crops	14.6	1.9	14.5	4.1	1.3	36.4	1.9	2.7	2.1	2.6	0.2	2.0	57
Peas	2.0	3.7	2.4	1.4		9.6	1.7	3.0	2.3	4.5		2.7	252
Beans	5.4	3.5	3.6	0.2		12.8	2.2	2.5	3.6	3.0		2.7	285
Vegetables (brassicae)	7.8		3.2		10.0	20.9	2.7		3.0		2.9	2.8	90
Vegetables (other)	7.6	2.7	2.5		2.7	18.2	2.1	2.7	3.8		1.0	2.0	73
Small fruit													44
Top fruit													52
Other tillage	6.3	0.4	2.0			8.7	2.5	2.7	1.9			2.4	189
All tillage	5.1	1.0	2.7	0.4	0.2	10.5	2.7	2.8	2.5	4.1	3.9	2.7	9113
Grass under 5 years	5.0	1.4	3.8		0.8	11.0	2.6	2.8	2.6		3.2	2.7	1971
Grass 5 years and over	2.2	0.2	1.8		0.6	4.7	2.4	1.5	2.6	3.8	1.7	2.3	3967
All grass	2.9	0.5	2.2		0.6	8.3	2.5	2.4	2.6	3.8	2.1	2.5	5938
All crops and grass	3.9	1.2	2.4	0.2	0.5	8.3	2.6	2.7	2.5	4.1	2.6	2.6	15051

Source: British Survey of Fertiliser Practice 1994

Table GB3.0 Product and nutrient use in Britain by month of application-1994

													Total Product
(a) Product Use													
Straight N	0	5	28	38	16	6	4	2	0	0	0	0	2374
Straight P	3	8	16	14	9	2	2	5	21	11	9	0	57
Straight K	9	24	14	9	3	1	1	1	8	13	15	4	90
Compounds	1	6	24	25	11	9	4	4	6	7	3	1	2941
Unknown	8	19	19	8	10	4	3	0	8	11	5	6	20
All fertilisers	1	6	26	30	13	7	4	3	4	4	2	0	5483
(b) Nutrient Use													Total nutrient
N	0	5	27	36	15	8	4	3	1	1	0	0	1307
P ₂ O ₅	1	7	24	21	8	3	2	4	10	13	4	1	376
K ₂ O	2	8	23	20	8	7	3	3	9	12	4	1	457
Total	1	6	26	30	12	7	4	3	4	5	2	0	2140

Note: *product use* refers to survey estimates of total tonnage of the products used by farmers in the survey year 1994
nutrient use refers to the tonnage of each nutrient contained in the products used, eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P₂O₅ and 10kg of K₂O; 100 kg of ammonium nitrate, one of the the 'straight N' products contains, typically, 34.5 kg of N

Table EW1.1 Total fertiliser use in England and Wales 1994

	Ha.* (000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	99	45	48	9	161	58	62	159	26	30	131
Winter wheat	1784	99	74	72	10	186	67	72	185	50	51	3100
Spring barley	219	98	75	79	22	103	43	57	101	32	45	476
Winter barley	569	99	78	81	15	142	64	76	141	50	61	1038
Oats	65	96	71	79	12	114	60	77	110	43	61	160
Rye	18	100	58	64	1	143	51	55	143	30	35	41
Early potatoes	21	99	100	100	42	192	203	259	189	203	259	61
Maincrop potatoes	99	99	93	94	36	202	211	276	200	196	259	253
Sugar beet	237	96	71	88	33	127	80	144	122	57	127	483
Oilseed rape	429	98	73	70	8	186	65	71	183	47	49	813
Linseed	88	89	51	43	5	69	51	56	62	26	24	162
Forage maize	37	97	84	71	89	84	56	61	81	47	43	71
Turnips (stock)	8	78	70	70	70	69	67	69	54	47	48	35
Kale and cow cabbage	8	71	65	65	58	96	37	46	68	24	30	21
Other roots/green crops	10	88	93	92	58	106	97	127	93	91	117	42
Peas	103	11	50	50	9	28	67	81	3	33	41	239
Beans	139	8	42	44	5	63	66	72	5	28	32	285
Vegetables (brassicae)	23	99	90	90	16	163	99	167	162	89	150	84
Vegetables (other)	17	87	81	90	17	131	79	150	115	64	135	66
Small fruit	8	97	42	78	2	67	58	149	65	24	117	42
Top fruit	26	87	56	65	0	79	41	31	69	23	20	52
Other tillage	92	74	68	57	62	83	61	83	61	42	47	193
All tillage	4056	92	72	72	15	162	71	85	149	51	62	7848
Grass under 5 years	998	91	75	76	48	184	46	70	168	34	53	1332
Grass 5 years and over	3198	77	59	58	43	131	34	42	101	20	24	2952
All grass	4197	80	63	62	44	145	37	50	117	23	31	4284
All crops & grass	8253	86	67	67	30	154	55	69	133	37	46	12132

*Estimated area under crop

Table EW1.2 Use of 'straight' fertiliser in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	96	2	3	142	69	88	137	1	3	131
Winter wheat	1784	97	7	6	175	77	92	170	5	6	3100
Spring barley	219	73	2	5	94	84	96	68	1	5	476
Winter barley	569	94	4	6	132	73	100	124	3	6	1038
Oats	65	81	2	7	113	51	122	91	1	9	160
Rye	18	99	1	•	123	132	•	121	2	•	41
Early potatoes	21	16	1	2	70	98	197	11	1	5	61
Maincrop potatoes	99	40	4	12	124	188	216	50	7	27	253
Sugar beet	237	85	4	25	108	107	130	92	4	33	483
Oilseed rape	429	94	7	8	174	67	88	164	4	7	813
Linseed	88	73	9	1	65	57	34	47	5	•	162
Forage maize	37	51	4	4	91	85	88	46	3	4	71
Turnips (stock)	8	14	•	•	82	•	•	11	•	•	35
Kale and cow cabbage	8	23	•	•	83	•	•	19	•	•	21
Other roots/green crops	10	19	4	3	108	376	300	21	16	9	42
Peas	103	1	5	5	89	83	107	1	4	6	239
Beans	139	2	7	9	126	76	92	2	5	8	285
Vegetables (brassicae)	23	66	•	6	125	•	91	83	•	5	84
Vegetables (other)	17	45	1	8	106	75	134	47	1	11	66
Small fruit	8	63	•	36	59	•	155	37	•	56	42
Top fruit	26	68	5	4	59	42	75	40	2	3	52
Other tillage	92	36	4	7	94	86	91	34	3	6	193
All tillage	4056	83	5	7	153	78	107	127	4	8	7848
Grass under 5 years	998	53	2	3	146	84	88	78	2	2	1332
Grass 5 years and over	3198	37	1	1	127	70	95	47	1	1	2952
All grass	4197	41	1	1	133	75	92	54	1	1	4284
All crops & grass	8253	62	3	4	146	78	105	90	3	5	12132

*Estimated area under crop

Table EW1.3 Use of compound fertiliser in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	57	33	43	44	66	58	60	22	25	26	131
Winter wheat	1784	33	68	66	45	66	69	15	45	46	3100
Spring barley	219	55	74	74	58	41	54	32	31	40	476
Winter barley	569	36	74	75	47	63	74	17	47	55	1038
Oats	65	33	70	72	56	60	72	18	42	52	160
Rye	18	34	57	64	64	49	55	22	28	35	41
Early potatoes	21	96	100	100	186	202	254	178	202	254	61
Maincrop potatoes	99	86	89	87	175	212	267	150	188	232	253
Sugar beet	237	35	68	71	86	77	131	30	52	94	483
Oilseed rape	429	42	67	62	45	64	68	19	43	42	813
Linseed	88	30	42	41	48	50	57	14	21	23	162
Forage maize	37	65	80	69	54	55	57	35	44	39	71
Turnips (stock)	8	65	70	70	66	67	69	43	47	48	35
Kale and cow cabbage	8	58	65	65	83	37	46	49	24	30	21
Other roots/green crops	10	79	89	89	92	84	120	72	75	107	42
Peas	103	10	45	45	24	64	78	2	29	35	239
Beans	139	6	35	35	40	63	66	3	22	23	285
Vegetables (brassicae)	23	81	90	90	96	99	161	78	89	145	84
Vegetables (other)	17	71	80	85	95	79	146	67	63	124	66
Small fruit	8	35	42	44	81	58	138	28	24	61	42
Top fruit	26	61	51	65	48	41	27	29	21	18	52
Other tillage	92	50	65	52	54	60	79	27	39	41	193
All tillage	4056	37	67	66	60	70	82	22	47	54	7848
Grass under 5 years	998	73	74	74	123	44	68	90	33	51	1332
Grass 5 years and over	3198	59	58	57	92	33	40	54	19	23	2952
All grass	4197	62	62	61	100	36	48	63	22	30	4284
All crops & grass	8253	50	65	64	86	53	65	43	34	42	12132

*Estimated area under crop

Table EW1.4 Use of lime in England and Wales 1994

	Ha* ('000)	Crop area receiving dressing (%)					Average field rate of CaO equivalent (tonne/ha)						fields in sample	
		ground limestone	ground chalk	magnesian limestone	sugar beet waste	other	all	ground limestone	ground chalk	magnesian limestone	sugar beet waste	other		all
Spring wheat	57	4.5	2.6	2.7	•	•	10.5	2.8	2.7	2.1	•	•	2.4	131
Winter wheat	1784	3.2	1.5	0.8	0.1	0.2	5.9	3.3	2.7	2.0	6.3	2.6	2.9	3100
Spring barley	219	5.6	1.2	1.8	0.5	1.4	11.0	2.6	2.7	3.0	2.6	8.1	3.2	476
Winter barley	569	7.2	1.7	2.4	•	0.1	11.9	2.8	3.9	2.6	•	1.5	2.8	1038
Oats	65	5.6	•	2.1	0.2	•	7.9	1.8	•	1.6	2.6	•	1.8	160
Rye	18	•	•	0.9	•	•	0.9	•	•	3.0	•	•	3.0	41
Early potatoes	21	5.7	•	•	•	•	5.7	2.1	•	•	•	•	2.1	61
Maincrop potatoes	99	0.3	•	0.6	•	•	0.9	2.1	•	2.1	•	•	2.1	253
Sugar beet	237	7.9	7.9	7.9	5.5	0.2	29.3	2.3	2.5	2.3	4.2	2.7	2.7	483
Oilseed rape	429	5.7	3.9	3.9	0.1	•	13.6	2.6	2.7	1.6	3.8	•	2.4	813
Linseed	88	•	0.2	•	0.3	•	0.5	•	1.0	•	2.6	•	2.0	162
Forage maize	37	8.5	1.9	5.4	•	•	15.9	2.3	0.6	2.9	•	•	2.3	71
Turnips (stock)	8	1.3	•	9.8	•	•	11.0	1.5	•	2.8	•	•	2.6	35
Kale and cow cabbage	8	1.2	•	•	•	•	1.2	2.7	•	•	•	•	2.7	21
Other roots/green crops	10	11.8	3.5	7.2	7.8	2.4	32.7	2.4	2.7	1.6	2.6	0.2	2.1	42
Peas	103	2.1	3.9	1.8	1.5	•	9.3	1.7	3.0	2.5	4.5	•	2.8	239
Beans	139	5.4	3.5	3.6	0.2	•	12.8	2.2	2.5	3.6	3.0	•	2.7	285
Vegetables (brassicae)	23	8.5	•	1.4	•	11.0	20.9	2.7	•	3.0	•	2.9	2.8	84
Vegetables (other)	17	7.3	3.0	1.1	•	3.0	17.2	2.0	2.7	3.0	•	1.0	1.7	66
Small fruit	8	•	•	•	•	•	•	•	•	•	•	•	•	42
Top fruit	26	•	•	•	•	•	•	•	•	•	•	•	•	52
Other tillage	93	6.4	0.4	1.9	•	•	8.7	2.5	2.7	1.8	•	•	2.4	194
All tillage	4056	4.6	2.2	2.1	0.5	0.3	9.7	2.8	2.8	2.3	4.1	3.9	2.7	7849
Grass under 5 years	999	5.7	1.8	3.4	•	0.9	11.9	2.6	2.8	2.5	•	3.3	2.6	1333
Grass 5 years and over	3198	2.0	0.2	1.4	0.1	0.7	4.4	2.4	1.5	2.6	3.8	1.8	2.3	2952
All grass	4197	2.9	0.6	1.9	•	0.7	6.2	2.5	2.4	2.5	3.8	2.3	2.5	4285
All crops & grass	8253	3.7	1.4	2.0	0.2	0.5	7.9	2.7	2.7	2.4	4.1	2.7	2.6	12134

*Estimated area under crop

Table EW1.5 Percentage of crop area by field application rate – N (England and Wales 1994)

crop %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
Spring wheat		1	•	•	5	3	13	19	45	6	5	2	•	131
Winter wheat		1	•	•	3	4	3	8	42	32	6	1	•	3100
Spring barley		2	1	4	11	32	23	18	8	•	•	•	•	476
Winter barley		1	1	•	3	10	15	28	35	6	1	•	•	1038
Oats		4	1	3	5	29	24	23	5	6	1	•	•	160
Rye		•	•	•	1	15	20	26	35	•	•	3	•	41
Early potatoes		1	4	•	•	1	14	3	22	34	19	1	•	61
Maincrop potatoes		1	1	1	2	5	8	4	27	24	23	7	•	253
Sugar beet		4	1	8	8	13	12	34	13	1	4	2	1	483
Oilseed rape		2	1	1	2	6	8	12	24	29	13	1	1	813
Linseed		11	2	16	32	29	6	1	3	•	•	•	•	162
Forage maize		3	11	9	19	26	5	22	5	•	•	•	•	71
Turnips (stock)		22	4	18	24	11	13	6	•	•	•	•	•	35
Kale and cow cabbage		29	•	•	23	37	1	2	1	1	5	•	•	21
Other roots/green crops		12	1	18	13	2	19	20	12	•	2	1	•	42
Peas		89	8	•	2	•	•	•	•	•	•	•	•	239
Beans		92	4	1	•	•	•	•	2	•	•	•	•	285
Vegetables (brassicæ)		1	1	7	16	2	20	7	8	14	18	6	•	84
Vegetables (other)		13	•	9	6	10	23	18	7	9	5	1	•	66
Small fruit		3	8	45	2	12	4	26	•	•	•	•	•	42
Top fruit		13	11	10	17	16	15	16	1	•	•	•	•	52
Other tillage		27	6	18	17	9	8	6	3	3	2	•	•	194
All tillage		8	1	2	5	8	8	13	29	19	5	1	•	7849
Grass under 5 years		9	•	7	9	7	6	7	15	14	12	11	2	1333
Grass 5 years and over		23	1	8	17	10	7	8	9	8	4	4	1	2952
All grass		20	1	8	15	9	7	8	11	9	6	6	1	4285
All crops & grass		14	1	5	10	9	7	10	20	14	6	3	1	12134

Source : British Survey of Fertiliser Practice 1994

Table EW1.6 Percentage of crop area by field application rate - P₂O₅ (England and Wales 1994)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
Spring wheat		55	4	13	21	3	•	1	•	2	•	•	•	131
Winter wheat		26	3	12	33	20	6	1	1	•	•	•	•	3100
Spring barley		25	9	44	16	5	2	•	•	•	•	•	•	476
Winter barley		22	3	13	39	18	3	1	1	•	•	•	•	1038
Oats		29	5	11	35	20	1	•	•	•	•	•	•	160
Rye		42	12	16	19	11	•	1	•	•	•	•	•	41
Early potatoes		•	4	•	1	•	14	5	16	20	36	3	•	61
Maincrop potatoes		7	2	2	1	3	4	6	19	20	24	10	1	253
Sugar beet		29	4	12	28	12	6	3	3	3	1	•	•	483
Oilseed rape		27	2	12	43	12	2	•	•	1	•	•	•	813
Linseed		49	4	20	23	3	•	•	1	•	•	•	•	162
Forage maize		16	1	33	35	11	4	•	•	•	•	•	•	71
Turnips (stock)		30	2	22	17	9	18	2	•	•	•	•	•	35
Kale and cow cabbage		35	7	43	13	•	1	•	•	•	•	•	•	21
Other roots/green crops		7	1	11	25	28	14	4	4	2	•	4	•	42
Peas		50	2	6	25	13	3	•	1	•	•	•	•	239
Beans		58	•	7	23	9	1	1	•	•	•	•	•	285
Vegetables (brassicæ)		10	4	7	24	5	12	23	14	•	•	•	•	84
Vegetables (other)		19	3	5	35	20	13	4	1	1	•	•	•	66
Small fruit		58	11	1	14	14	2	•	•	•	•	•	•	42
Top fruit		44	20	13	12	11	•	•	•	•	•	•	•	52
Other tillage		32	5	19	25	6	11	1	•	•	1	•	•	194
All tillage		28	3	14	31	15	4	1	1	1	1	•	•	7849
Grass under 5 years		25	20	29	17	5	1	1	3	•	•	•	•	1333
Grass 5 years and over		41	21	26	7	3	1	•	•	•	•	•	•	2952
All grass		37	21	27	10	3	1	•	1	•	•	•	•	4285
All crops & grass		33	12	20	20	9	3	1	1	•	•	•	•	12134

Table EW1.7 Percentage of crop area by field application rate – K₂O (England & Wales 1994)

crop %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
Spring wheat		52	3	13	21	5	2	1	*	2	*	*	*	131
Winter wheat		28	3	10	28	21	6	1	2	*	*	*	*	3100
Spring barley		21	4	32	23	14	3	*	1	*	1	*	*	476
Winter barley		19	2	9	29	25	9	3	2	1	*	*	*	1038
Oats		21	5	8	24	23	18	*	3	*	*	*	*	160
Rye		36	18	4	21	13	7	*	*	*	*	*	*	41
Early potatoes		*	4	*	*	*	5	2	14	13	25	35	2	61
Maincrop potatoes		6	1	3	*	1	3	3	11	12	17	32	12	253
Sugar beet		12	*	1	10	13	11	16	24	9	1	2	1	483
Oilseed rape		30	2	11	32	15	4	1	2	2	*	*	*	813
Linseed		57	5	23	7	4	4	*	*	*	*	1	*	162
Forage maize		29	5	24	14	18	8	2	*	*	*	*	*	71
Turnips (stock)		30	2	16	22	13	18	*	*	*	*	*	*	35
Kale and cow cabbage		35	5	44	4	5	1	5	*	*	*	*	*	21
Other roots/green crops		8	1	3	18	10	19	6	27	4	*	3	*	42
Peas		50	1	5	20	12	9	*	1	1	*	1	*	239
Beans		56	1	5	22	10	4	1	*	1	*	*	*	285
Vegetables (brassicae)		10	3	17	5	2	2	1	24	16	6	13	*	84
Vegetables (other)		10	*	6	6	12	8	5	39	9	6	*	*	66
Small fruit		22	*	1	7	2	12	3	44	*	9	*	*	42
Top fruit		35	29	22	11	1	*	3	*	*	*	*	*	52
Other tillage		43	3	11	21	8	5	2	3	4	*	*	1	194
All tillage		28	3	11	25	17	6	2	4	2	1	1	*	7849
Grass under 5 years		24	12	19	12	15	7	5	3	1	1	*	*	1333
Grass 5 years and over		42	18	23	7	6	2	1	1	*	*	*	*	2952
All grass		38	16	22	8	8	3	2	1	*	*	*	*	4285
All crops & grass		33	10	17	16	13	5	2	3	1	1	1	*	12134

Source : British Survey of Fertiliser Practice 1994

Table EW2.1 Average fertiliser practice by grassland utilisation in England and Wales 1994

	Ha. * ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Grazed – not mown	2348	74	57	53	31	123	32	32	91	18	17	2079
Grazed – mown	1405	91	71	75	60	163	39	65	149	28	49	1703
All grazings	3753	80	62	61	42	140	35	47	113	22	29	3782
Cut for seed grazed	3	100	44	66	*	109	44	99	109	19	66	10
Cut for seed not grazed	5	92	67	67	18	194	49	72	179	32	48	12
All cut for seed	8	95	57	67	11	158	47	82	151	27	55	22
Cut for silage grazed	950	94	75	80	67	186	42	75	175	32	60	1142
Cut for silage not grazed	288	99	88	88	57	199	55	76	197	49	67	325
All cut for silage	1238	95	78	82	65	189	45	75	180	36	61	1467
Cut for hay grazed	450	86	63	65	44	111	33	39	95	21	25	549
Cut for hay not grazed	123	39	31	32	76	86	32	40	34	10	13	109
All cut for hay	573	76	56	58	51	108	32	39	82	18	22	658
All mowings	1819	89	71	74	60	167	42	66	149	30	49	2147
All grass	4197	80	63	62	44	145	37	50	117	23	31	4284

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

Table EW2.2 Percentage of grass area by field application rate – N (England and Wales 1994)

row X	kg/ha	0	<25	25	50	75	100	125	150	200	250	300	400+	fields in sample
Grazed – not mown		26	2	9	19	9	6	6	8	6	4	4	1	2079
Grazed – mown		9	•	6	11	10	8	10	16	14	7	7	2	1703
All grazings		20	1	8	16	10	7	8	11	9	5	5	1	3782
Cut for seed grazed		•	•	15	•	45	•	•	40	•	•	•	•	10
Cut for seed not grazed		8	•	•	•	•	•	59	2	•	18	14	•	12
All cut for seed		5	•	6	•	18	•	35	17	•	11	9	•	22
Cut for silage grazed		6	•	4	7	8	6	10	18	18	10	11	3	1142
Cut for silage not grazed		1	•	2	8	7	6	9	16	21	15	15	1	325
All cut for silage		5	•	4	8	8	6	10	17	18	11	12	2	1467
Cut for hay grazed		14	•	10	18	14	12	10	11	6	2	•	1	549
Cut for hay not grazed		61	1	12	8	6	3	3	5	1	1	•	•	109
All cut for hay		24	1	10	16	13	10	8	10	5	2	•	1	658
All mowings		11	•	6	10	9	7	9	15	14	8	8	2	2147
All grass		20	1	8	15	9	7	8	11	9	6	6	1	4285

Source : British Survey of Fertiliser Practice 1994

Table EW2.3 Percentage of grass area by field application rate - P₂O₅ (England and Wales 1994)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
		43	23	24	6	2	.	1	.	.	.	.	.	2079
Grazed - not mown		29	20	30	15	4	1	.	.	.	.	.	.	1703
Grazed - mown		38	22	26	9	3	1	.	.	.	.	.	.	3782
All grazings		56	.	30	13	.	.	.	.	.	.	.	.	10
Cut for seed grazed		33	16	5	42	4	.	.	.	.	.	.	.	12
Cut for seed not grazed		43	10	15	31	2	.	.	.	.	.	.	.	22
All cut for seed		25	21	28	20	5	2	.	.	.	.	.	.	1142
Cut for silage grazed		12	14	41	15	5	3	1	9	.	.	.	.	325
Cut for silage not grazed		22	19	31	19	5	2	.	2	.	.	.	.	1467
All cut for silage		37	20	35	5	3	.	.	.	.	.	.	.	549
Cut for hay grazed		69	11	14	5	1	.	.	.	.	.	.	.	109
Cut for hay not grazed		44	18	30	5	3	.	.	.	.	.	.	.	658
All cut for hay		29	19	31	14	4	1	.	2	.	.	.	.	2147
All mowings		37	21	27	10	3	1	.	1	.	.	.	.	4285
All grass														

Source : British Survey of Fertiliser Practice 1994

Table EW2.4 Percentage of grass area by field application rate – K₂O (England and Wales 1994)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
Grazed – not mown		47	20	23	6	3	•	•	•	•	•	•	•	2079
Grazed – mown		25	14	22	12	13	7	2	3	1	1	•	•	1703
All grazings		39	18	23	8	7	3	1	1	•	•	•	•	3782
Cut for seed grazed		34	6	21	•	13	12	•	•	14	•	•	•	10
Cut for seed not grazed		33	•	36	3	16	•	4	8	•	•	•	•	12
All cut for seed		33	2	30	2	15	5	2	5	6	•	•	•	22
Cut for silage grazed		20	13	16	15	17	9	3	5	1	1	•	•	1142
Cut for silage not grazed		12	6	24	12	22	10	10	4	1	•	•	•	325
All cut for silage		18	11	17	14	18	10	5	5	1	1	•	•	1467
Cut for hay grazed		35	15	36	5	6	1	•	1	•	•	•	•	549
Cut for hay not grazed		68	9	16	2	1	3	•	•	•	•	•	•	109
All cut for hay		42	14	32	5	5	2	•	1	•	•	•	•	658
All mowings		26	12	22	11	14	7	3	3	1	1	•	•	2147
All grass		38	16	22	8	8	3	2	1	•	•	•	•	4285

Source: British Survey of Fertiliser Practice 1994

Table EW3.0 Product and nutrient use in England & Wales by month of application-1994

(a) Product Use													Total Product
row %													
Straight N	0	5	29	38	16	5	3	2	0	0	0	0	2152
Straight P	3	5	16	14	9	3	2	5	22	12	10	0	53
Straight K	9	24	13	9	3	1	1	1	8	13	15	4	89
Compounds	1	7	26	21	10	9	4	4	6	8	3	1	2365
Unknown	8	21	21	8	4	1	4	0	9	12	5	7	18
All fertilisers	1	6	27	29	13	7	4	3	4	5	2	1	4677

(b) Nutrient Use													Total nutrient
row %													
N	0	5	29	35	15	8	4	3	1	1	0	0	1125
P ₂ O ₅	2	8	26	18	7	3	2	4	11	14	5	1	310
K ₂ O	2	9	24	16	8	7	3	3	9	13	5	1	386
Total	1	7	27	28	12	7	4	3	4	5	2	1	1820

Note: *product use* refers to survey estimate of total tonnage of the products used by farmers in the survey year 1994.

nutrient use refers to the tonnage of each nutrient contained in the products used eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P₂O₅ and 10kg of K₂O; 100 kg of ammonium nitrate, one of the the 'straight N' products contains, typically, 34.5 kg of N.

Source: British Survey of Fertiliser Practice 1994

Table EW5.1 Average fertiliser practice on dairy farms in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	4	•	•	•	•	•	•	•	•	•	•	7
Winter wheat	201	99	80	76	24	179	65	75	177	52	57	348
Spring barley	33	96	87	91	53	93	41	50	90	35	45	80
Winter barley	95	99	86	84	25	144	66	72	142	57	61	170
Oats	8	97	72	69	17	125	57	67	122	41	47	24
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	3	•	•	•	•	•	•	•	•	•	•	6
Maincrop potatoes	4	•	•	•	•	•	•	•	•	•	•	9
Sugar beet	5	•	•	•	•	•	•	•	•	•	•	7
Oilseed rape	30	97	72	68	10	202	62	70	195	44	48	61
Linseed	10	98	84	36	6	64	55	55	63	46	20	14
Forage maize	18	100	100	72	91	74	53	61	74	53	44	33
Turnips (stock)	4	79	57	57	86	56	60	61	45	34	35	19
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	2
Other roots/green crops	2	100	100	100	48	92	71	88	92	71	88	11
Peas	5	•	•	•	•	•	•	•	•	•	•	9
Beans	6	8	45	45	17	41	75	73	3	34	33	13
Vegetables (brassicæ)	2	•	•	•	•	•	•	•	•	•	•	3
Vegetables (other)	1	•	•	•	•	•	•	•	•	•	•	3
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	37	81	74	60	83	66	54	62	53	40	37	65
All tillage	468	95	81	76	35	148	63	73	141	51	56	884
Grass under 5 years	421	96	77	78	65	214	43	86	205	33	67	548
Grass 5 years and over	1007	87	66	65	55	157	38	49	137	25	32	1031
All grass	1428	90	69	69	58	175	39	61	157	27	42	1579
All crops & grass	1897	91	72	71	52	168	46	64	153	33	46	2463

*Estimated area under crop

Table EW5.2 Average fertiliser practice on cattle & sheep farms in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	5	100	79	79	35	171	89	93	171	71	73	12
Winter wheat	204	100	82	81	26	154	69	71	154	57	57	241
Spring barley	34	97	90	90	50	82	34	37	80	30	34	69
Winter barley	88	100	77	81	33	134	67	73	133	51	59	137
Oats	16	95	90	90	11	97	54	76	92	48	68	41
Rye	1	.	.	.	.	.	.	.	.	.	.	3
Early potatoes	0	.	.	.	.	.	.	.	.	.	.	0
Maincrop potatoes	5	98	98	98	77	221	198	275	217	195	271	10
Sugar beet	4	.	.	.	.	.	.	.	.	.	.	4
Oilseed rape	29	95	79	79	22	170	69	78	161	55	62	51
Linseed	3	.	.	.	.	.	.	.	.	.	.	6
Forage maize	5	.	.	.	.	.	.	.	.	.	.	9
Turnips (stock)	2	.	.	.	.	.	.	.	.	.	.	9
Kale and cow cabbage	3	94	91	91	82	86	35	40	81	32	36	12
Other roots/green crops	2	64	96	74	82	85	140	108	55	134	80	10
Peas	1	.	.	.	.	.	.	.	.	.	.	3
Beans	11	6	35	35	9	25	66	66	1	23	23	14
Vegetables (brassicae)	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	1	.	.	.	.	.	.	.	.	.	.	2
Small fruit	0	.	.	.	.	.	.	.	.	.	.	0
Top fruit	0	.	.	.	.	.	.	.	.	.	.	0
Other tillage	19	69	67	54	79	81	51	57	56	34	31	27
All tillage	432	94	80	79	33	139	66	72	131	53	57	660
Grass under 5 years	305	88	75	77	40	163	43	63	143	33	49	396
Grass 5 years and over	1299	79	66	64	39	111	31	36	88	20	23	1099
All grass	1604	81	68	66	39	122	33	42	98	23	28	1495
All crops & grass	2036	83	70	69	38	126	41	49	105	29	34	2155

*Estimated area under crop

Table EW5.3 Average fertiliser practice on other livestock/mixed farms in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	7	100	63	63	•	159	55	46	159	35	29	13
Winter wheat	153	99	79	79	4	205	67	79	202	53	62	284
Spring barley	18	97	77	78	36	124	43	47	120	33	37	30
Winter barley	58	95	75	87	12	149	69	88	141	52	77	87
Oats	5	100	100	100	8	110	63	75	110	63	75	12
Rye	0	•	•	•	•	•	•	•	•	•	•	2
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	1
Maincrop potatoes	12	100	92	92	55	171	188	281	171	172	257	26
Sugar beet	20	92	80	88	60	127	68	172	117	55	151	21
Oilseed rape	51	100	79	83	2	210	66	82	210	52	68	82
Linseed	9	83	37	37	7	76	43	43	63	16	16	15
Forage maize	5	92	92	89	85	53	57	52	48	52	46	17
Turnips (stock)	0	•	•	•	•	•	•	•	•	•	•	2
Kale and cow cabbage	0	•	•	•	•	•	•	•	•	•	•	0
Other roots/green crops	1	•	•	•	•	•	•	•	•	•	•	4
Peas	8	•	50	61	30	•	46	81	•	23	49	16
Beans	13	5	52	58	7	121	65	75	6	34	43	26
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	1	•	•	•	•	•	•	•	•	•	•	2
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	8	43	24	6	63	63	62	64	27	15	4	17
All tillage	371	91	75	78	15	177	70	92	161	53	71	657
Grass under 5 years	36	91	62	68	25	224	70	59	204	43	41	71
Grass 5 years and over	118	87	54	55	21	172	41	58	150	22	32	147
All grass	153	88	56	58	22	184	49	58	163	27	34	218
All crops & grass	524	90	70	72	17	179	65	84	161	45	60	875

*Estimated area under crop

Table EW5.4 Average fertiliser practice on cropping/horticultural farms in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	PYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	37	98	35	36	3	163	58	68	160	20	24	94
Winter wheat	1021	99	69	67	4	193	67	70	192	47	47	2090
Spring barley	118	99	69	74	4	108	47	66	107	32	49	282
Winter barley	273	100	77	78	5	143	63	77	143	49	60	598
Oats	25	97	80	88	3	120	65	73	117	52	64	72
Rye	13	100	67	76	0	138	46	51	138	31	39	32
Early potatoes	15	98	100	100	43	194	203	254	190	203	254	52
Maincrop potatoes	74	99	96	97	29	203	217	277	201	207	269	203
Sugar beet	196	97	71	88	27	127	81	141	123	58	123	440
Oilseed rape	273	98	70	67	8	185	65	69	182	46	46	578
Linseed	49	85	54	48	6	74	56	63	63	30	30	123
Forage maize	4	95	78	78	100	104	49	69	98	38	54	10
Turnips (stock)	1	.	.	.	.	.	.	.	.	.	.	.
Kale and cow cabbage	1	.	.	.	.	.	.	.	.	.	.	.
Other roots/green crops	4	87	85	93	46	122	94	153	107	80	142	16
Peas	84	11	47	48	4	25	69	81	3	32	39	205
Beans	88	10	44	47	4	62	66	74	6	29	35	215
Vegetables (brassicae)	21	99	89	89	12	168	97	160	167	86	143	81
Vegetables (other)	15	90	83	93	11	126	83	154	113	68	143	59
Small fruit	8	97	42	78	2	67	58	149	65	24	117	42
Top fruit	26	87	56	65	0	79	41	31	69	23	20	52
Other tillage	23	74	72	68	17	126	76	131	94	55	89	79
All tillage	2370	92	69	70	8	168	74	91	154	51	64	5331
Grass under 5 years	108	93	67	65	13	171	48	68	159	32	44	214
Grass 5 years and over	201	72	30	30	13	132	44	57	96	13	17	383
All grass	308	79	43	42	13	148	46	63	118	20	27	597
All crops & grass	2679	90	66	67	8	166	72	89	150	48	60	5928

*Estimated area under crop

Table EW5.5 Average fertiliser practice on part-time[†] farms in England and Wales 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	3	•	•	•	•	•	•	•	•	•	•	5
Winter wheat	205	99	82	76	19	176	66	70	174	54	53	137
Spring barley	16	92	63	61	11	107	43	75	98	27	46	15
Winter barley	54	98	66	79	20	139	58	66	136	39	52	46
Oats	10	94	7	38	31	118	43	115	110	3	43	11
Rye	3	•	•	•	•	•	•	•	•	•	•	4
Early potatoes	3	•	•	•	•	•	•	•	•	•	•	2
Maincrop potatoes	5	•	•	•	•	•	•	•	•	•	•	5
Sugar beet	12	100	68	100	40	125	100	164	125	68	164	11
Oilseed rape	46	100	81	62	7	165	62	65	165	50	40	41
Linseed	18	•	•	•	•	•	•	•	•	•	•	4
Forage maize	5	•	•	•	•	•	•	•	•	•	•	2
Turnips (stock)	0	•	•	•	•	•	•	•	•	•	•	1
Kale and cow cabbage	3	•	•	•	•	•	•	•	•	•	•	3
Other roots/green crops	1	•	•	•	•	•	•	•	•	•	•	1
Peas	5	•	•	•	•	•	•	•	•	•	•	6
Beans	21	•	29	23	•	•	62	58	•	18	14	17
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	5	•	•	•	•	•	•	•	•	•	•	5
All tillage	414	92	69	67	18	157	67	78	144	47	52	316
Grass under 5 years	129	81	77	76	43	125	51	40	101	40	30	103
Grass 5 years and over	574	55	41	41	45	108	29	35	59	12	14	292
All grass	702	60	48	47	45	112	36	36	67	17	17	395
All crops & grass	1117	72	56	55	35	133	50	55	95	28	30	711

[†] Part-time is defined as less than 250 Standard Man Days input per annum

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC1.1 Total fertiliser use in Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	104	100	95	96	15	201	85	88	200	81	84	244
Spring barley	217	99	98	98	34	90	54	61	89	53	60	490
Winter barley	48	98	95	95	17	170	78	79	166	74	75	118
Oats	42	100	100	100	19	86	51	58	86	50	58	87
Rye	1	100	100	100	•	191	90	90	191	90	90	1
Early potatoes	5	100	100	100	75	182	119	140	182	119	140	10
Maincrop potatoes	18	95	96	96	35	169	192	238	161	184	227	38
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	84	100	97	97	27	159	65	66	159	62	64	156
Linseed	2	9	•	•	83	100	•	•	9	•	•	3
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	20	100	100	100	47	74	128	109	74	128	109	60
Kale and cow cabbage	3	100	93	87	56	84	58	56	84	54	49	11
Other roots/green crops	9	100	100	100	18	95	84	85	95	84	85	15
Peas	5	34	51	51	•	28	67	72	9	34	37	13
Beans	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicacae)	2	80	80	80	•	180	112	136	144	89	108	6
Vegetables (other)	2	100	100	100	54	103	136	118	103	136	118	7
Small fruit	1	100	100	100	•	33	53	33	33	53	33	2
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	2	58	58	38	91	77	65	65	44	37	25	5
All tillage	563	98	96	96	28	131	72	77	128	69	74	1266
Grass under 5 years	326	94	79	75	41	141	43	52	132	34	39	638
Grass 5 years and over	643	87	74	70	33	116	35	38	101	26	26	1015
All grass	969	89	76	72	36	125	38	43	111	29	30	1653
All crops & grass	1532	93	83	81	33	127	52	58	118	43	46	2919

*Estimated area under crop

Table SC1.2 Use of 'straight' fertiliser in Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	0
Winter wheat	104	98	•	2	176	113	95	174	•	2	244
Spring barley	217	41	•	•	51	•	225	21	•	•	490
Winter barley	48	90	•	3	151	•	81	136	•	2	118
Oats	42	39	•	•	73	•	•	29	•	•	87
Rye	1	100	•	•	173	•	•	173	•	•	1
Early potatoes	5	•	•	3	•	•	225	•	•	7	10
Maincrop potatoes	18	3	•	5	60	•	89	2	•	4	38
Sugar beet	0	•	•	•	•	•	•	•	•	•	0
Oilseed rape	84	80	•	•	142	•	•	114	•	•	156
Linseed	2	9	•	•	100	•	•	9	•	•	3
Forage maize	0	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	20	•	3	•	•	152	•	•	5	•	60
Kale and cow cabbage	3	22	•	•	27	•	•	6	•	•	11
Other roots/green crops	9	9	•	•	114	•	•	10	•	•	15
Peas	5	•	•	•	•	•	•	•	•	•	13
Beans	0	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicae)	2	80	•	•	105	•	•	83	•	•	6
Vegetables (other)	2	48	•	•	81	•	•	39	•	•	7
Small fruit	1	•	•	•	•	•	•	•	•	•	2
Top fruit	0	•	•	•	•	•	•	•	•	•	0
Other tillage	2	•	•	•	•	•	•	•	•	•	5
All tillage	563	58	•	1	125	136	100	72	•	1	1266
Grass under 5 years	326	42	2	1	116	121	116	49	2	1	638
Grass 5 years and over	643	34	1	•	91	99	113	31	1	•	1015
All grass	969	37	1	•	100	107	115	37	2	•	1653
All crops & grass	1532	45	1	1	112	109	106	50	1	1	2919

*Estimated area under crop

Table SC1.3 Use of compound fertiliser in Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	0
Winter wheat	104	76	95	94	35	84	87	27	80	82	244
Spring barley	217	96	98	98	71	54	61	68	53	60	490
Winter barley	48	81	95	95	38	78	77	31	74	73	118
Oats	42	96	100	100	60	51	58	58	50	58	87
Rye	1	100	100	100	19	90	90	19	90	90	1
Early potatoes	5	100	100	100	182	119	133	182	119	133	10
Maincrop potatoes	18	95	96	96	168	192	233	159	184	223	38
Sugar beet	0	•	•	•	•	•	•	•	•	•	0
Oilseed rape	84	90	97	97	49	65	66	44	62	64	156
Linseed	2	•	•	•	•	•	•	•	•	•	3
Forage maize	0	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	20	100	100	100	74	124	109	74	124	109	60
Kale and cow cabbage	3	93	93	87	84	58	56	78	54	49	11
Other roots/green crops	9	100	100	100	85	84	85	85	84	85	15
Peas	5	34	51	51	28	67	72	9	34	37	13
Beans	0	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicacae)	2	80	80	80	76	112	136	60	89	108	6
Vegetables (other)	2	88	100	100	73	136	118	64	136	118	7
Small fruit	1	100	100	100	33	53	33	33	53	33	2
Top fruit	0	•	•	•	•	•	•	•	•	•	0
Other tillage	2	58	58	38	77	65	65	44	37	25	5
All tillage	563	89	96	96	63	72	76	56	69	73	1266
Grass under 5 years	326	77	79	75	108	41	51	83	32	38	638
Grass 5 years and over	643	75	74	70	93	33	37	70	24	26	1015
All grass	969	76	76	71	98	36	42	74	27	30	1653
All crops & grass	1532	81	83	80	84	51	57	68	42	46	2919

*Estimated area under crop

Table SC1.4 Use of lime in Scotland 1994

	Crop area receiving dressing (%)					Average field rate of CaO equivalent (tonnes/ha)					Fields in sample		
	ground limestone	ground chalk	magnesian limestone	sugar beet lime	other	all	ground limestone	ground chalk	magnesian limestone	sugar beet lime		other	all
Spring wheat												0	
Winter wheat	2.7		6.2			6.9	2.4		2.3			2.4	243
Spring barley	8.2		8.6			17.0	2.2		3.7			2.9	490
Winter barley	13.2		7.0			20.2	2.8		2.2			2.5	118
Oats	15.6		8.1			23.7	2.3		2.2			2.3	87
Rye													1
Early potatoes	5.0					5.0	2.7					2.7	10
Maincrop potatoes			1.8			1.8			3.0			3.0	38
Sugar beet													0
Oilseed rape	17.5		4.7			22.2	2.5		2.7			2.6	158
Linseed													3
Forage maize													0
Turnips (stock)	5.0		11.0			16.3	2.7		2.5			2.5	60
Kale and cow cabbage													11
Other roots/green crops	17.8		22.9			40.7	1.6		2.2			2.0	15
Peas			15.9			15.9			1.6			1.6	13
Beans													0
Vegetables (brassicae)			20.4			20.4			3.0			3.0	6
Vegetables (other)	12.2		15.3			27.5	2.7		4.3			3.6	7
Small fruit													2
Top fruit													0
Other tillage			8.7			8.7			3.0			3.0	5
All tillage	9.2		7.5			16.8	2.4		3.0			2.6	1264
Grass under 5 years	2.8		4.9		0.2	8.0	2.7		2.9		1.5	2.8	638
Grass 5 years and over	2.8		2.7		0.4	6.2	2.2		2.4		0.2	2.1	1015
All grass	2.8		3.5		0.3	6.8	2.4		2.7		0.5	2.4	1653
All crops and grass	5.1		4.9		0.2	10.4	2.4		2.8		0.5	2.5	2917

Source: British Survey of Fertiliser Practice 1994

Table SC1.5 Percentage of crop area by field application rate – N (Scotland 1994)

Crop	0	<25	25	50	75	100	125	150	200	250	300	400+	Total in hectares
Spring wheat	•	•	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	•	2	•	•	5	1	4	28	48	11	1	•	244
Spring barley	1	2	7	19	25	37	6	1	•	1	•	•	490
Winter barley	2	3	2	•	2	9	15	36	31	•	•	•	118
Oats	•	5	9	22	38	12	8	3	1	2	•	•	87
Rye	•	•	•	•	•	•	•	100	•	•	•	•	1
Early potatoes	•	•	•	30	•	8	•	13	10	10	30	•	10
Maincrop potatoes	5	•	3	•	11	8	7	43	14	10	•	•	38
Sugar beet	•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	•	1	4	10	8	14	10	19	20	10	3	•	156
Linseed	91	•	•	•	•	9	•	•	•	•	•	•	3
Forage maize	•	•	•	•	•	•	•	•	•	•	•	•	0
Tumips (stock)	•	•	17	34	38	2	3	4	1	•	•	•	60
Kale and cow cabbage	•	34	16	•	7	13	18	•	7	6	•	•	11
Other roots/green crops	•	•	4	20	41	18	7	7	2	•	•	•	15
Peas	66	28	•	•	6	•	•	•	•	•	•	•	13
Beans	•	•	•	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicae)	20	•	•	•	•	•	34	•	46	•	•	•	6
Vegetables (other)	•	•	•	12	20	68	•	•	•	•	•	•	7
Small fruit	•	•	100	•	•	•	•	•	•	•	•	•	2
Top fruit	•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage	42	20	•	•	9	29	•	•	•	•	•	•	5
All tillage	2	3	5	12	17	19	7	14	15	4	1	•	1266
Grass under 5 years	6	1	6	14	14	9	12	17	6	9	5	•	638
Grass 5 years and over	13	1	10	18	14	12	13	10	5	3	2	•	1015
All grass	11	1	9	16	14	11	13	12	5	5	3	•	1653
All crops & grass	7	2	7	15	15	14	11	13	9	5	2	•	2919

Source : British Survey of Fertiliser Practice 1994

Table SC1.6 Percentage of crop area by field application rate – P₂O₅ (Scotland 1994)

crop %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	
Winter wheat		5	.	2	19	61	12	1	.	.	.	.	.	244
Spring barley		2	5	33	48	11	1	1	.	.	.	.	.	490
Winter barley		5	3	13	17	52	5	.	4	.	.	.	.	118
Oats		.	1	49	36	11	.	2	1	.	.	.	.	87
Rye		100	.	.	.	.	.	.	.	1
Early potatoes		.	.	30	.	.	.	10	51	10	.	.	.	10
Maincrop potatoes		4	.	4	.	.	5	6	43	18	15	5	.	38
Sugar beet		0
Oilseed rape		3	2	29	35	27	2	.	.	.	1	.	.	156
Linseed		100	.	.	.	.	.	.	.	.	.	.	.	3
Forage maize		0
Turnips (stock)		.	.	4	6	19	22	3	40	5	.	2	.	60
Kale and cow cabbage		7	16	36	25	.	10	.	.	7	.	.	.	11
Other roots/green crops		.	7	8	25	31	7	19	4	.	.	.	.	15
Peas		49	.	14	18	19	.	.	.	.	.	.	.	13
Beans		0
Vegetables (brassicae)		20	.	.	.	34	.	46	.	.	.	.	.	6
Vegetables (other)		53	20	12	15	.	.	.	7
Small fruit		.	.	.	100	.	.	.	.	.	.	.	.	2
Top fruit		0
Other tillage		42	.	.	49	9	.	.	.	.	.	.	.	5
All tillage		4	3	23	33	26	5	2	4	1	1	.	.	1266
Grass under 5 years		21	21	35	12	4	3	1	2	.	.	.	.	638
Grass 5 years and over		26	27	35	7	2	1	1	1	.	.	.	.	1015
All grass		24	25	35	9	3	2	1	1	.	.	.	.	1653
All crops & grass		17	17	31	17	11	3	1	2	1	.	.	.	2919

Table SC1.7 Percentage of crop area by field application rate - K₂O (Scotland 1994)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	fields in sample
Spring wheat		•	•	•	•	•	•	•	•	•	•	•	•	0
Winter wheat		4	•	1	20	57	16	1	1	•	•	•	•	244
Spring barley		2	4	23	50	17	2	•	1	1	•	•	•	490
Winter barley		5	3	8	17	57	6	2	2	•	•	•	•	118
Oats		•	1	42	31	22	1	•	1	2	•	•	•	87
Rye		•	•	•	•	100	•	•	•	•	•	•	•	1
Early potatoes		•	•	30	•	•	•	10	30	17	10	•	3	10
Maincrop potatoes		4	•	•	4	•	4	•	4	25	51	5	1	38
Sugar beet		•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape		3	2	15	37	40	2	•	•	•	•	•	•	156
Linseed		100	•	•	•	•	•	•	•	•	•	•	•	3
Forage maize		•	•	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)		•	•	1	16	37	16	3	25	1	2	•	•	60
Kale and cow cabbage		13	16	36	25	•	4	•	•	7	•	•	•	11
Other roots/green crops		•	7	8	30	35	•	16	•	5	•	•	•	15
Peas		49	•	6	26	19	•	•	•	•	•	•	•	13
Beans		•	•	•	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicae)		20	•	•	•	34	•	•	46	•	•	•	•	6
Vegetables (other)		•	•	•	36	•	15	20	29	•	•	•	•	7
Small fruit		•	•	100	•	•	•	•	•	•	•	•	•	2
Top fruit		•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage		62	•	•	29	9	•	•	•	•	•	•	•	5
All tillage		4	2	16	34	32	5	1	2	2	2	•	•	1266
Grass under 5 years		25	17	26	14	8	6	4	1	•	•	•	•	638
Grass 5 years and over		30	25	28	7	4	3	1	1	•	•	•	•	1015
All grass		28	23	27	10	5	4	2	1	•	•	•	•	1653
All crops & grass		19	15	23	18	15	5	2	1	1	1	•	•	2919

Source : British Survey of Fertiliser Practice 1994

Table SC2.1 Average fertiliser practice by grassland utilisation in Scotland 1994

	Ha. * ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Grazed – not mown	651	86	71	66	27	104	30	28	90	22	19	1037
Grazed – mown	129	96	85	85	47	157	51	67	151	43	57	220
All grazings	780	88	73	69	30	114	34	36	100	25	25	1257
Cut for seed grazed	0	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	0	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	0	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	101	96	85	87	53	169	53	70	163	45	60	169
Cut for silage not grazed	144	100	90	86	63	183	53	72	183	48	62	280
All cut for silage	244	98	88	86	59	177	53	71	174	47	61	449
Cut for hay grazed	28	97	83	81	29	112	45	54	109	37	44	51
Cut for hay not grazed	38	88	76	80	46	108	35	38	95	27	30	103
All cut for hay	67	92	79	81	39	110	39	45	101	31	36	154
All mowings	311	97	86	85	54	164	50	66	159	43	56	603
All grass	969	89	76	72	36	125	38	43	111	29	30	1653

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

Table SC2.2 Percentage of grass area by field application rate – N (Scotland 1994)

row %	kg/ha	0	<25	25	50	75	100	125	150	200	250	300	400+	fields in sample
		14	1	11	21	15	12	11	8	2	4	1	•	1037
Grazed – not mown		4	1	3	7	14	7	19	17	14	8	5	•	220
Grazed – mown		12	1	10	19	15	11	12	9	4	4	2	•	1257
All grazings		•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed grazed		•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed		•	•	•	•	•	•	•	•	•	•	•	•	0
All cut for seed		4	2	2	4	9	8	19	18	17	10	6	•	169
Cut for silage grazed		•	•	4	1	6	9	16	29	13	11	11	•	280
Cut for silage not grazed		2	1	3	3	7	9	17	25	14	10	9	•	449
All cut for silage		3	•	4	18	33	5	18	15	5	•	1	•	51
Cut for hay grazed		12	1	8	15	19	14	13	14	2	2	•	•	103
Cut for hay not grazed		8	1	6	16	25	10	15	15	3	1	1	•	154
All cut for hay		3	1	4	5	11	9	17	23	12	8	7	•	603
All mowings		11	1	9	16	14	11	13	12	5	5	3	•	1653
All grass														

Source : British Survey of Fertiliser Practice 1994

Table SC2.3 Percentage of grass area by field application rate - P₂O₅ (Scotland 1994)

Area %	0	25	50	75	100	125	150	200	250	300	400	Index in sample
Grazed - not mown	29	30	32	5	1	1	1	•	•	•	•	1037
Grazed - mown	15	17	33	14	9	8	1	•	•	•	•	220
All grazings	27	28	33	7	2	2	1	•	•	•	•	1257
Cut for seed grazed	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	•	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	•	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	15	18	31	14	11	10	2	•	•	•	•	169
Cut for silage not grazed	10	9	47	18	6	3	2	3	1	•	•	280
All cut for silage	12	13	40	16	8	6	2	2	1	•	•	449
Cut for hay grazed	17	16	42	17	4	•	•	4	•	•	•	51
Cut for hay not grazed	24	19	44	10	3	•	•	•	•	•	•	103
All cut for hay	21	18	43	13	3	•	•	2	•	•	•	154
All mowings	14	14	41	16	7	5	2	2	1	•	•	603
All grass	24	25	35	9	3	2	1	1	•	•	•	1653

Source : British Survey of Fertiliser Practice 1994

Table SC2.4 Percentage of grass area by field application rate - K₂O (Scotland 1994)

Rate %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown		34	29	28	7	1	.	.	.	.	.	.	.	1037
Grazed - mown		15	10	21	23	11	15	3	2	.	.	.	.	220
All grazings		31	26	27	9	2	3	1	.	.	.	.	.	1257
Cut for seed grazed		0
Cut for seed not grazed		0
All cut for seed		0
Cut for silage grazed		13	11	18	23	11	18	3	3	.	.	.	.	169
Cut for silage not grazed		14	7	27	10	20	11	10	2	.	.	.	.	280
All cut for silage		14	8	23	15	16	14	7	2	.	.	.	.	449
Cut for hay grazed		19	7	34	23	9	4	4	.	.	.	.	.	51
Cut for hay not grazed		20	18	46	12	4	2	.	.	.	.	.	.	103
All cut for hay		19	13	41	17	6	3	2	.	.	.	.	.	154
All mowings		15	9	27	15	14	12	6	2	.	.	.	.	603
All grass		28	23	27	10	5	4	2	1	.	.	.	.	1653

Source: British Survey of Fertiliser Practice 1994

Table SC3.0 Product and nutrient use in Scotland by month of application-1994

(a) Product Use													Total Product
row %													
Straight N	0	5	25	36	17	8	7	1	0	0	0	0	222
Straight P	0	44	19	15	16	0	3	0	0	0	4	0	4
Straight K	0	46	31	15	0	0	0	0	0	8	0	0	2
Compounds	1	2	16	41	15	10	3	3	4	5	0	0	577
Unknown	0	0	1	0	67	32	0	0	0	0	0	0	2
All fertilisers	0	3	19	40	16	9	4	2	3	3	0	0	806

(b) Nutrient Use													Total nutrient
row %													
N	0	3	20	41	16	10	6	2	1	1	0	0	182
P ₂ O ₅	1	4	16	37	14	5	2	3	7	8	1	0	67
K ₂ O	1	3	17	38	13	8	2	3	7	8	1	0	72
Total	0	3	19	39	15	9	4	3	4	4	0	0	320

Note: *product use* refers to survey estimates of total tonnage of the products used by farmers in the survey year 1994

nutrient use refers to the tonnage of each nutrient contained in the products used eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P₂O₅ and 10kg of K₂O; 100 kg of ammonium nitrate, one of the the 'straight N' products contains, typically, 34.5 kg of N.

Table SC5.1 Average fertiliser practice on general cropping farms in Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	79	100	96	96	11	204	85	88	204	81	85	164
Spring barley	106	100	98	98	24	97	56	65	97	55	64	213
Winter barley	24	100	98	99	4	195	83	84	195	81	82	61
Oats	19	100	99	99	12	92	56	63	92	55	62	43
Rye	1	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	5	100	100	100	75	182	119	140	182	119	140	10
Maincrop potatoes	15	94	95	95	33	171	196	240	161	186	227	30
Sugar beet	0	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	56	99	97	97	14	166	68	65	165	66	63	116
Linseed	2	.	.	.	.	.	.	.	.	.	.	2
Forage maize	0	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	5	100	100	100	53	81	112	112	81	112	112	13
Kale and cow cabbage	0	.	.	.	.	.	.	.	.	.	.	0
Other roots/green crops	1	.	.	.	.	.	.	.	.	.	.	3
Peas	4	37	55	55	0	28	67	72	10	36	39	12
Beans	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	2	.	.	.	.	.	.	.	.	.	.	5
Vegetables (other)	1	.	.	.	.	.	.	.	.	.	.	5
Small fruit	1	.	.	.	.	.	.	.	.	.	.	2
Top fruit	0	.	.	.	.	.	.	.	.	.	.	0
Other tillage	1	.	.	.	.	.	.	.	.	.	.	2
All tillage	322	98	96	96	19	148	77	83	145	74	80	682
Grass under 5 years	51	97	61	62	14	142	45	51	137	28	32	140
Grass 5 years and over	34	90	54	54	24	107	36	37	96	20	20	118
All grass	85	94	58	59	18	129	42	46	121	24	27	258
All crops & grass	406	97	88	89	18	144	72	78	140	63	69	940

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC5.2 Average fertiliser practice on dairy farms in Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	*	*	*	*	*	*	*	*	*	*	0
Winter wheat	4	*	*	*	*	*	*	*	*	*	*	7
Spring barley	17	100	100	100	90	76	42	44	76	42	44	39
Winter barley	5	84	92	92	54	122	77	77	103	71	71	12
Oats	3	*	*	*	*	*	*	*	*	*	*	9
Rye	0	*	*	*	*	*	*	*	*	*	*	0
Early potatoes	0	*	*	*	*	*	*	*	*	*	*	0
Maincrop potatoes	0	*	*	*	*	*	*	*	*	*	*	0
Sugar beet	0	*	*	*	*	*	*	*	*	*	*	0
Oilseed rape	5	*	*	*	*	*	*	*	*	*	*	6
Linseed	0	*	*	*	*	*	*	*	*	*	*	0
Forage maize	0	*	*	*	*	*	*	*	*	*	*	0
Turnips (stock)	1	*	*	*	*	*	*	*	*	*	*	4
Kale and cow cabbage	0	*	*	*	*	*	*	*	*	*	*	0
Other roots/green crops	0	*	*	*	*	*	*	*	*	*	*	0
Peas	0	*	*	*	*	*	*	*	*	*	*	0
Beans	0	*	*	*	*	*	*	*	*	*	*	0
Vegetables (brassicae)	0	*	*	*	*	*	*	*	*	*	*	0
Vegetables (other)	0	*	*	*	*	*	*	*	*	*	*	0
Small fruit	0	*	*	*	*	*	*	*	*	*	*	0
Top fruit	0	*	*	*	*	*	*	*	*	*	*	0
Other tillage	0	*	*	*	*	*	*	*	*	*	*	1
All tillage	35	98	98	97	71	94	59	58	92	57	56	78
Grass under 5 years	62	97	86	75	71	209	56	75	202	48	56	123
Grass 5 years and over	147	89	78	75	58	161	43	52	144	34	39	348
All grass	209	91	80	75	62	177	47	59	161	38	44	471
All crops & grass	244	92	83	78	63	164	49	58	151	41	46	549

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC5.3 Average fertiliser practice on mixed farms in Scotland 1994

	Ha.* (000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	15	98	100	100	6	221	84	87	218	84	87	55
Spring barley	31	100	100	100	46	89	58	62	89	58	62	83
Winter barley	11	100	95	95	26	172	82	83	172	78	79	28
Oats	3	.	.	.	.	.	.	.	.	.	.	9
Rye	0	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	0	.	.	.	.	.	.	.	.	.	.	0
Maincrop potatoes	1	.	.	.	.	.	.	.	.	.	.	6
Sugar beet	0	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	4	100	95	95	21	191	62	69	191	59	66	16
Linseed	0	.	.	.	.	.	.	.	.	.	.	0
Forage maize	0	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	3	100	100	100	71	77	134	99	77	134	99	11
Kale and cow cabbage	1	.	.	.	.	.	.	.	.	.	.	3
Other roots/green crops	0	.	.	.	.	.	.	.	.	.	.	1
Peas	0	.	.	.	.	.	.	.	.	.	.	0
Beans	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	0	.	.	.	.	.	.	.	.	.	.	1
Vegetables (other)	0	.	.	.	.	.	.	.	.	.	.	1
Small fruit	0	.	.	.	.	.	.	.	.	.	.	0
Top fruit	0	.	.	.	.	.	.	.	.	.	.	0
Other tillage	0	.	.	.	.	.	.	.	.	.	.	0
All tillage	71	99	98	98	32	141	75	78	139	73	77	214
Grass under 5 years	50	98	86	85	52	159	39	50	155	33	43	81
Grass 5 years and over	52	90	80	79	13	106	33	34	95	26	27	108
All grass	102	94	83	82	32	133	36	43	124	30	35	189
All crops & grass	173	96	89	89	32	136	53	59	130	48	52	403

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC5.4 Average fertiliser practice on farms in less favoured areas (Scotland) 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	6	100	76	76	51	175	79	87	175	60	66	15
Spring barley	48	100	99	99	29	89	57	63	89	56	62	139
Winter barley	9	99	88	88	18	144	59	60	142	52	53	17
Oats	9	100	100	100	41	89	59	74	89	59	74	23
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	1	•	•	•	•	•	•	•	•	•	•	2
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	8	100	90	90	8	115	54	54	115	49	49	15
Linseed	0	•	•	•	•	•	•	•	•	•	•	1
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	9	100	100	100	30	69	132	105	69	132	105	28
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	7
Other roots/green crops	7	100	100	100	18	89	83	77	89	83	77	11
Peas	0	•	•	•	•	•	•	•	•	•	•	1
Beans	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	1
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	1	•	•	•	•	•	•	•	•	•	•	2
All tillage	101	100	96	95	28	100	68	70	99	65	67	262
Grass under 5 years	141	94	84	80	36	110	39	42	104	32	34	272
Grass 5 years and over	391	88	76	69	28	102	32	32	90	24	22	423
All grass	532	90	78	72	30	104	34	35	94	26	25	695
All crops & grass	632	91	81	76	30	103	40	42	95	32	32	957

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

APPENDIX CONTENTS

MAPS

GB TABLES 1994

- GB 3.1 Product type as percentage of all product used by crop group
- GB 3.2 Use of product type by crop group
- GB 3.3 Product use in Britain by month of application

ENGLAND AND WALES TABLES 1994

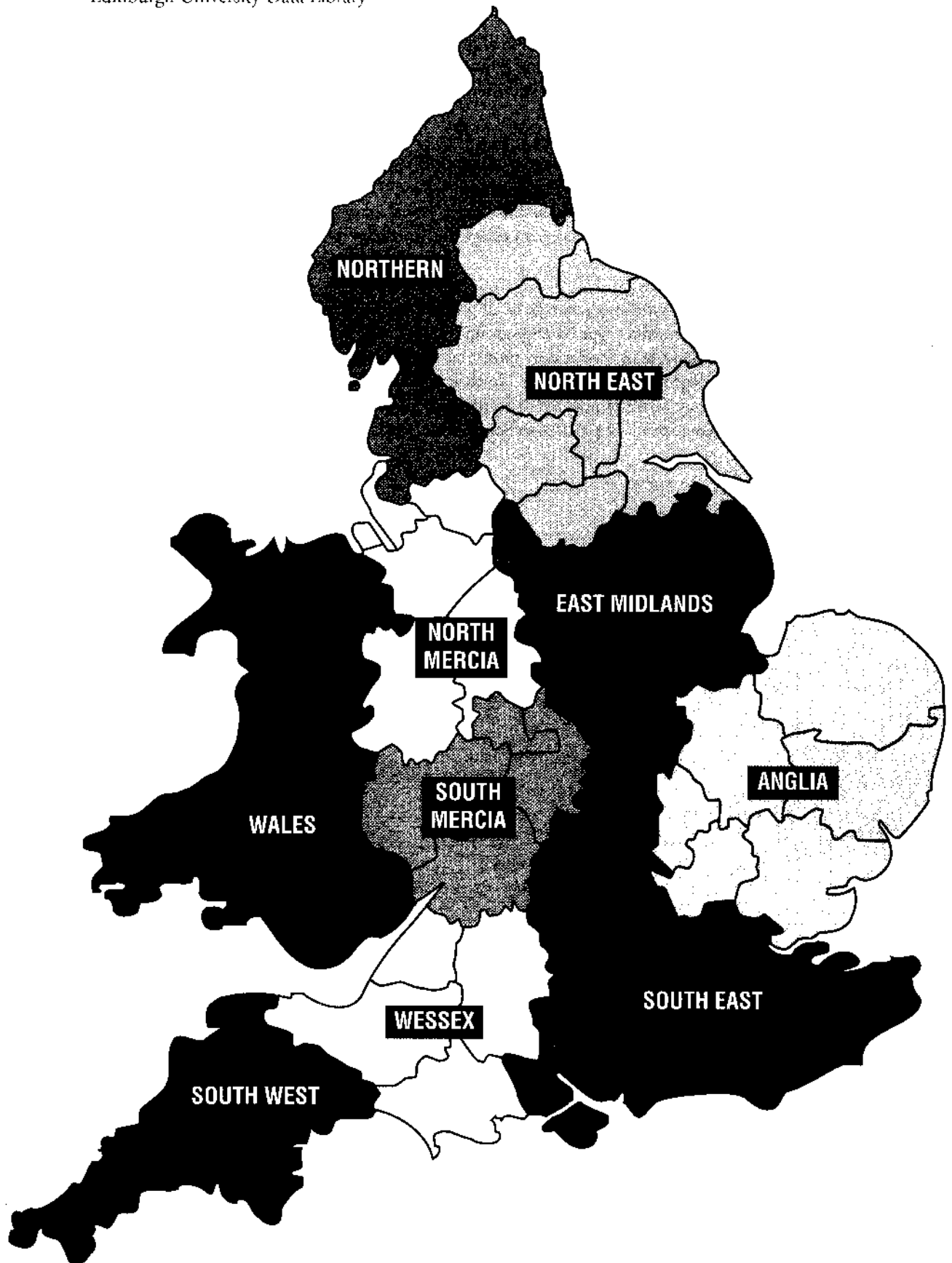
- EW 3.1 Product type as percentage of all product used by crop group
- EW 3.2 Use of product type by crop group
- EW 3.3 Product use in England and Wales by month of application
- EW 4.1 Average fertiliser practice on tillage and grassland by MAFF region

SCOTLAND TABLES 1994

- SC 3.1 Product type as percentage of all product used by crop group
- SC 3.2 Use of product type by crop group
- SC 3.3 Product use in Scotland by month of application
- SC 4.1 Average fertiliser practice in North East Scotland
- SC 4.2 Average fertiliser practice in South East Scotland
- SC 4.3 Average fertiliser practice in South West Scotland

BRITISH SURVEY OF FERTILISER PRACTICE
MAFF Administrative Regions

Generalised from digital maps provided by
Edinburgh University Data Library



BRITISH SURVEY OF FERTILISER PRACTICE
SOAFD Administrative Regions

Generalised from digital maps provided by
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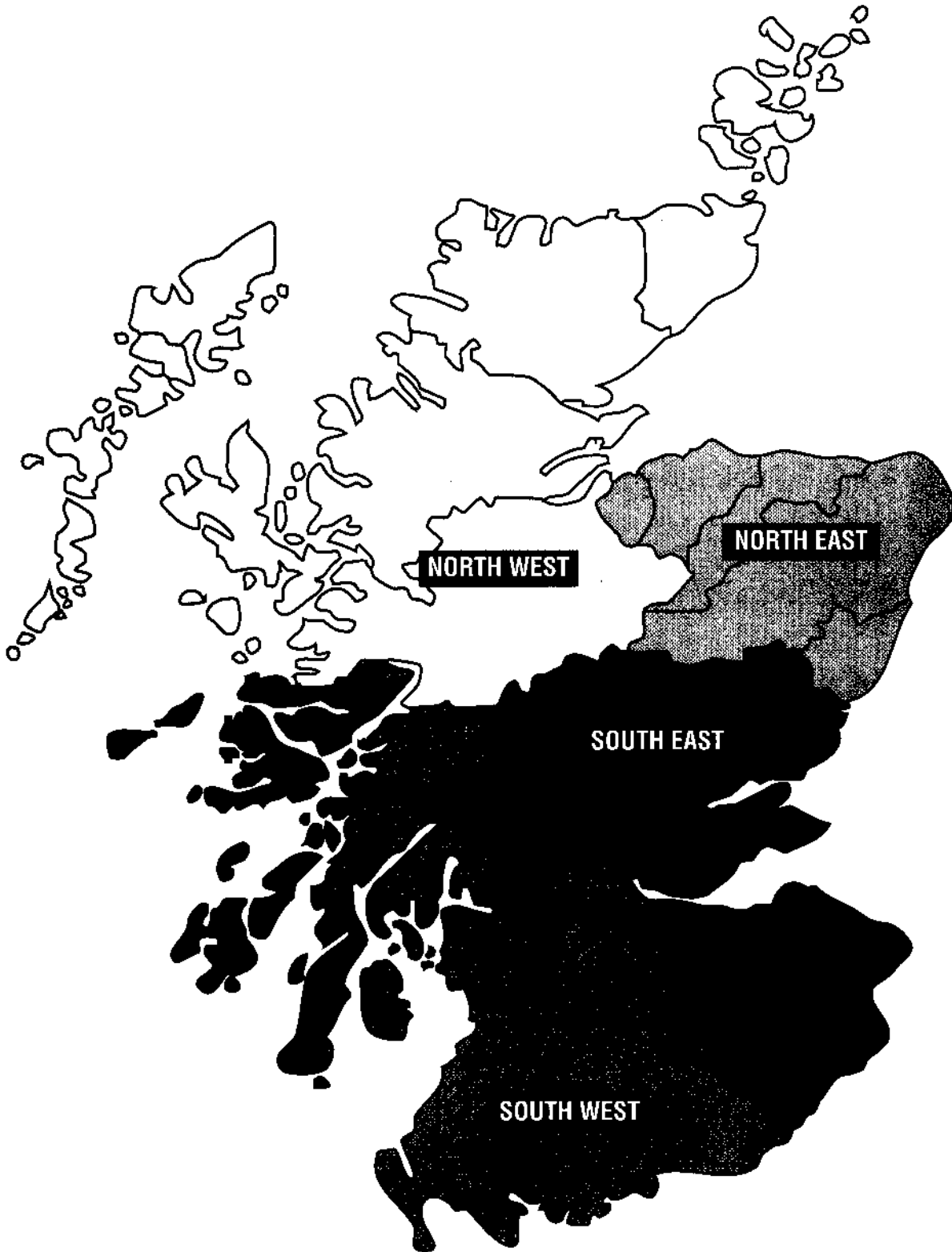


Table GB3.1 Product type as percentage of all product used by crop group in Britain 1994

Product %	Grain total	Winter cereal	Summer cereal	Other crop	All other crop	Oil seed	All other	Grass total	Grass for feeding	Grass for hay	Grass for silage	Grass not used	All grass	All other & other
Calcium Ammonium Nitrate	0.6	0.8	0.1	0.1	0.7	0.8	0.7	0.1	2.5	0.2	*	0.3	0.5	
Urea	2.7	7.8	0.8	2.3	9.6	3.1	6.3	2.3	2.2	2.1	60.7	2.6	4.8	
Ammonium Nitrate	26.3	47.4	5.2	20.5	44.5	17.7	38.2	32.7	27.9	24.2	11.8	28.1	33.9	
Other Straight N	3.3	7.2	1	2.6	7.6	2.5	5.8	1.3	2.3	2.3	0.5	1.9	4.1	
Triple Super Phosphate	0.2	1.2	0.8	0.4	1.1	1.9	1	0.4	*	0.4	*	0.4	0.8	
Single Super Phosphate	0.1	*	*	0.2	*	0.2	0.1	0.2	*	0.1	*	0.1	0.1	
Other Straight P	0.2	0.3	*	0.9	0.1	0.4	0.3	0.1	*	*	*	0.1	0.2	
Muriate of Potash	0.8	1.2	2.1	1.2	1.4	2.5	1.4	0.1	0.3	0.7	0.2	0.4	0.9	
Other Straight K	0.2	0.1	0.4	13.1	*	0.5	1.2	*	*	0.1	*	*	0.7	
NP	0.7	1.2	2.5	1	2.1	5.5	1.7	5.5	0.9	4.3	*	4.6	2.9	
NK	1.5	1.3	1.6	2.4	0.9	2	1.4	1.8	2.2	14.8	1.1	8.2	4.3	
PK	5.9	15.9	3.9	30	8.8	17.7	14.7	1.8	1	1.7	2.5	1.7	9.2	
Very High N	2.4	2.4	0.6	0.4	1.2	1.2	1.9	27.2	18.4	18.8	2	22.3	10.6	
High N	27.2	1	3.4	1.4	2.4	9.3	4.1	21.8	33.5	17.5	12	20.4	11	
High P	1.3	1.3	5.4	1.8	1.5	3.8	1.8	0.1	0.2	0.2	*	0.1	1.1	
High K	9.2	2.8	47.6	13.2	3.9	14.7	8.1	0.7	1.2	4.9	3.7	2.8	5.9	
Low N	5.1	7.4	14.6	1.2	8.7	9	7.5	0.7	2.4	1	3	1	4.7	
Low P	1.6	0.1	1	3.7	0.2	4.2	0.9	1.7	1.8	5.7	0.9	3.7	2.1	
Equal NPK	10.2	0.6	8	0.2	5.4	2.5	2.5	1.3	2.4	0.8	1.7	1.1	1.9	
Unknown	0.6	0.1	1.1	3.5	*	0.5	0.5	0.1	0.9	0.2	*	0.2	0.4	
Total prod ('000 tonnes)	250	1835	211	249	365	230	3139	1026	149	1148	19	2341	5480	

Source: British Survey of Fertiliser Practice 1994

Table GB3.2 Use of product type by crop group in Britain 1994

('000 tonnes)

row %	Spring cereal	Winter cereal	potatoes	sugar beet	oil seed rape	other silage	all silage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	all crops & grass
Calcium Ammonium Nitrate	5.8	51.8	0.7	0.6	8.7	6.4	74.1	2.4	13.6	9.9	•	25.9	27.7
Urea	2.6	54.5	0.6	2.2	13.5	2.7	76.2	8.9	1.3	9.1	4.4	23.6	261.1
Ammonium Nitrate	3.5	46.8	0.6	2.7	8.7	2.2	64.6	18.1	2.2	14.9	0.1	35.3	1858.3
Other Straight N	3.6	58.6	0.9	2.8	12.2	2.5	80.6	6	1.5	11.8	•	19.4	226.9
Triple Super Phosphate	0.9	50.4	3.8	2.4	9.3	10.5	77.4	10.7	•	11.6	•	22.3	42.3
Single Super Phosphate	2.5	18.2	•	9.9	•	9.8	40.4	35.9	•	23.7	•	59.6	5
Other Straight P	4	46.7	0.8	21	1.9	10.1	84.6	10.5	0.6	4.3	•	15.4	10.1
Muriate of Potash	3.8	42.9	8.6	5.9	9.6	10.9	81.7	1.6	0.8	15.6	0.1	18.1	52
Other Straight K	1.4	4.9	2	85.7	0.3	3	97.3	1.1	•	1.7	•	2.7	38.2
NP	1.1	14.2	3.3	1.5	4.8	7.9	32.8	35.5	0.8	30.7	•	67.1	159.5
NK	1.5	9.8	1.4	2.5	1.3	1.9	18.5	8	1.4	72	0.1	81.5	235.8
PK	2.9	58.1	1.6	14.9	6.4	8.1	92	3.7	0.3	3.9	0.1	8	502.5
Very High N	1	7.5	0.2	0.2	0.8	0.5	10.2	47.9	4.7	37.1	0.1	89.8	581.3
High N	11.2	3.1	1.2	0.6	1.5	3.5	21.1	37	8.2	33.3	0.4	78.9	605
High P	5.6	39.4	18.8	7.3	8.8	14.6	94.4	1.6	0.5	3.5	•	5.6	60.4
High K	7.1	15.9	31.2	10.2	4.5	10.5	79.4	2.2	0.5	17.5	0.2	20.4	321.4
Low N	5	52.6	12	1.2	12.3	8	91.1	2.6	1.4	4.7	0.2	8.9	257.2
Low P	3.5	1.2	1.8	8.2	0.7	8.6	23.9	15.5	2.4	58	0.2	76.1	113
Equal NPK	24.1	10.5	16	0.4	18.6	5.4	75	13.1	3.3	8.2	0.3	25	105.3
Unknown	7.4	8.3	11.8	43.1	0.4	6.1	77.1	6.5	6.4	10	•	22.9	20.3
Total product	4.6	33.5	3.8	4.5	6.7	4.2	57.2	18.7	2.7	20.9	0.3	42.7	5483.4

Source: British Survey of Fertiliser Practice 1994

Table GB3.3 Product use by month of application in Britain 1994

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product (000 tonnes)
Calcium Ammonium Nitrate	•	25	26	29	7	9	2	1	•	•	•	•	28
Urea	•	6	38	33	11	4	6	•	1	•	•	•	261
Ammonium Nitrate	•	5	27	39	16	6	4	2	1	•	•	•	1858
Other Straight N	•	8	31	39	18	2	1	•	•	•	•	•	227
Triple Super Phosphate	3	10	18	11	11	3	2	7	19	7	9	•	42
Single Super Phosphate	•	7	6	59	1	•	•	•	12	16	•	•	5
Other Straight P	3	2	12	3	6	•	2	•	32	24	16	•	10
Muriate of Potash	7	24	21	12	4	1	1	2	11	11	5	1	52
Other Straight K	11	24	4	4	•	1	•	•	4	15	29	9	38
NP	1	6	33	24	12	7	9	2	1	3	1	•	160
NK	•	4	9	8	21	41	11	4	1	•	•	•	236
PK	4	12	13	7	2	•	•	3	18	28	10	3	502
Very High N	•	3	24	34	13	12	7	6	1	•	•	•	581
High N	•	2	23	44	18	6	5	2	•	1	•	•	605
High P	•	12	41	17	11	2	•	1	8	2	4	1	60
High K	•	8	46	26	4	3	1	1	5	4	1	•	321
Low N	2	7	25	11	6	1	•	8	13	19	6	1	257
Low P	1	5	18	26	15	25	5	3	•	•	2	•	113
Equal NPK	•	2	32	34	12	4	1	5	7	3	•	•	105
Unknown	8	19	19	8	10	4	3	•	8	11	5	6	20
All fertilisers	1	6	26	30	13	7	4	3	4	4	2	•	5483

Source: British Survey of Fertiliser Practice 1994

Table EW3.1 Product type as percentage of all product used by crop group in England and Wales 1994

nutrient %	Spring cereal	Winter cereal	Potatoes	other fruit	oil seed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	all crops & grass
Caesium Ammonium Nitrate	1	0.8	0.1	0.1	0.7	0.9	0.7	•	3	0.1	•	0.3	0.5
Urea	4.6	8	0.9	2.3	10.5	3.5	6.8	2.2	2.4	2.1	63.3	2.7	5.2
Ammonium Nitrate	39.9	47.6	6.1	20.5	46.5	19.5	39.9	35.6	30.1	25.5	12.4	29.9	35.8
Other Straight N	4.3	7.5	1.1	2.6	7.5	2.8	6.2	1.4	2.7	2.5	0.5	2.1	4.5
Triple Super Phosphate	0.3	1.2	0.9	0.4	1.3	2.2	1.2	0.4	•	0.4	•	0.3	0.8
Single Super Phosphate	0.1	0.1	•	0.2	•	0.2	0.1	0.2	•	0.1	•	0.2	0.1
Other Straight P	0.3	0.3	•	0.9	0.1	0.3	0.3	0.1	0.1	•	•	0.1	0.2
Muriate of Potash	1.4	1.3	2.4	1.2	1.6	2.8	1.5	0.1	0.3	0.8	0.2	0.5	1.1
Other Straight K	0.4	0.1	0.4	13.1	•	0.6	1.3	0.1	•	•	•	•	0.8
NP	1.3	1.3	2.9	1	2.3	5.9	1.8	5	0.9	4.1	•	4.2	2.8
NK	1.4	1.2	1.9	2.4	1	2.3	1.4	2.1	2.1	16.4	1.1	9.3	4.6
PK	9.6	16.7	4.4	30	9.9	20	16.2	2	1.2	1.7	2.7	1.8	10.3
Very High N	1.9	2.5	0.7	0.4	1.5	1.4	2	24.6	17.4	17.3	1.9	20.2	9.4
High N	18	0.8	1.4	1.4	1.1	8.1	2.3	21.4	32.3	16.9	8.6	19.7	9.4
High P	1.6	1.3	5.8	1.8	1.5	2.2	1.7	0.1	0.2	0.2	•	0.1	1.1
High K	5.7	3	47.5	13.2	3.1	14.8	7.8	0.8	0.7	5	3.9	2.9	5.8
Low N	4.1	5.5	13.4	1.2	7.4	5.3	5.8	0.7	2.7	1.1	3.1	1.1	3.9
Low P	2.1	0.1	1.1	3.7	0.1	4.7	0.9	1.7	1.1	5.3	1	3.5	2
Equal NPK	1.9	0.5	7.4	0.2	3.9	1.7	1.5	1.3	1.6	0.4	1.3	0.9	1.2
Unknown	0.2	0.1	1.3	3.5	•	0.6	0.5	0.2	1	0.1	•	0.2	0.4
Total prod ('000 tonnes)	134	1700	179	249	306	200	2768	800	125	964	18	1907	4675

Source: British Survey of Fertiliser Practice 1994

Table EW3.2 Use of product type by crop group in England and Wales 1994

('000 tonnes)

row %	Spring cereal	Winter cereal	potatoes	sugar beet	oil seed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	all crops & grass
Calcium Ammonium Nitrate	5.2	57.1	0.8	0.7	8.7	7.1	79.5	0.5	15	5	•	20.5	25.1
Urea	2.5	56.5	0.7	2.4	13.2	2.9	78.3	7.3	1.3	8.2	4.7	21.5	241.6
Ammonium Nitrate	3.2	48.2	0.6	3	8.5	2.3	65.9	17	2.2	14.7	0.1	34	1675.9
Other Straight N	2.7	60.8	1	3.1	10.9	2.7	81.3	5.5	1.6	11.6	•	18.7	209.6
Triple Super Phosphate	1	53.9	4.1	2.6	10	11.3	83	8	•	8.7	•	16.7	39.3
Single Super Phosphate	2.5	18.2	•	9.9	•	9.8	40.4	35.9	•	23.7	•	59.6	5
Other Straight P	4.5	51.9	0.9	23.3	2.2	6.7	89.4	8.4	0.7	1.5	•	10.6	9.1
Muriate of Potash	3.7	42.8	8.5	6	9.8	11.2	82	1.6	0.8	15.2	0.1	17.7	50.8
Other Straight K	1.4	4.9	1.8	86.5	0.3	3	97.9	1.1	•	1	•	2.1	37.9
NP	1.3	16.7	4	1.9	5.3	9	38.2	30.8	0.8	30.1	•	61.7	130.9
NK	0.8	9.6	1.6	2.7	1.4	2.1	18.1	7.7	1.2	72.9	0.1	81.9	217.1
PK	2.7	58.6	1.6	15.5	6.3	8.3	92.9	3.3	0.3	3.3	0.1	7.1	483.3
Very High N	0.6	9.8	0.3	0.2	1	0.6	12.6	44.6	4.9	37.9	0.1	87.4	441.3
High N	5.5	3.3	0.6	0.8	0.8	3.7	14.6	38.9	9.2	37	0.4	85.4	439.8
High P	4.3	43.9	20.3	8.6	9	8.6	94.5	1.6	0.6	3.2	•	5.5	51.2
High K	2.8	18.5	31.3	12.1	3.4	10.9	79.2	2.3	0.3	17.8	0.3	20.7	271.6
Low N	3.1	52.2	13.3	1.7	12.6	5.9	88.7	3.1	1.9	6	0.3	11.3	180.4
Low P	3.1	1.5	2.2	10.1	0.5	10.3	27.7	15.2	1.5	55.4	0.2	72.3	91.7
Equal NPK	4.4	16	23.1	0.8	20.9	6.1	71.2	17.8	3.5	7	0.4	28.8	57.4
Unknown	1.4	9.2	12.9	47.4	0.4	6.7	78	7.2	7	7.8	•	22	18.4
Total product	2.9	36.3	3.8	5.3	6.5	4.3	59.2	17.1	2.7	20.6	0.4	40.8	4677.4

Source: British Survey of Fertiliser Practice 1994

Table EW3.3 Product use in England & Wales by month of application 1994

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product (100 tonnes)
Calcium Ammonium Nitrate	0	28	27	29	6	9	1	0	0	0	0	0	25
Urea	0	7	37	33	12	4	5	0	1	0	0	0	242
Ammonium Nitrate	0	5	27	39	16	6	3	3	1	0	0	0	1676
Other Straight N	0	8	31	40	18	2	1	0	0	0	0	0	210
Triple Super Phosphate	3	6	19	11	12	3	2	7	20	8	9	0	39
Single Super Phosphate	0	7	6	59	1	0	0	0	12	16	0	0	5
Other Straight P	4	2	10	3	0	0	2	0	35	26	17	0	9
Muriate of Potash	7	24	21	12	5	1	1	2	11	11	5	1	51
Other Straight K	11	23	4	4	0	1	0	0	4	15	29	9	38
NP	0	8	38	19	11	7	10	2	1	4	1	0	131
NK	0	4	9	6	22	41	12	4	1	0	0	0	217
PK	4	12	13	7	2	0	0	3	18	28	11	3	483
Very High N	0	3	26	34	12	11	6	6	1	0	0	0	441
High N	0	2	26	39	19	5	5	2	1	1	0	0	440
High P	0	14	49	13	7	1	0	1	7	2	4	1	51
High K	0	10	50	20	3	3	1	1	6	5	1	0	272
Low N	1	6	31	10	4	1	0	9	12	16	8	2	180
Low P	1	6	23	20	16	23	5	4	0	0	2	0	92
Equal NPK	0	4	36	29	8	3	1	7	8	4	0	0	57
Unknown	8	21	21	8	4	1	4	0	9	12	5	7	18
All fertilisers	1	6	27	29	13	7	4	3	4	5	2	1	4677

Source: British Survey of Fertiliser Practice 1994

Table EW4.1 Average fertiliser practice on tillage and grassland by MAFF Region 1994

		Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
			N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Wessex	All tillage	290	94	73	72	28	140	62	71	132	46	51	538
	All grass	424	79	45	48	44	149	36	55	117	16	26	605
	All crops & grass	714	85	56	57	38	145	50	63	123	28	36	1143
Anglia	All tillage	1057	90	62	59	10	164	73	89	148	45	53	2088
	All grass	108	78	32	26	14	158	61	78	123	20	20	173
	All crops & grass	1166	89	60	56	10	164	72	88	146	43	50	2261
Northern	All tillage	155	94	83	93	24	151	63	84	141	52	78	313
	All grass	596	86	76	75	54	147	34	48	127	26	36	584
	All crops & grass	751	88	77	79	48	148	40	57	130	31	45	897
North East	All tillage	402	95	71	81	18	175	81	106	167	57	87	783
	All grass	350	83	68	64	53	136	35	51	113	24	33	380
	All crops & grass	752	90	70	73	34	158	60	84	142	42	61	1163
North Mercia	All tillage	187	97	79	85	37	144	64	91	139	51	78	383
	All grass	342	81	64	60	58	221	56	65	178	36	39	394
	All crops & grass	530	86	69	69	51	190	59	76	164	41	52	777
South Mercia	All tillage	287	91	75	71	22	161	69	77	147	52	55	395
	All grass	254	84	62	58	21	138	35	46	115	22	27	216
	All crops & grass	541	88	69	65	21	151	55	64	132	38	42	611
East Midlands	All tillage	739	92	72	72	6	178	71	82	164	51	59	1619
	All grass	282	79	51	50	37	134	30	42	106	16	21	295
	All crops & grass	1021	88	66	66	15	167	63	74	148	41	48	1914
South East	All tillage	495	91	73	74	10	167	63	73	151	46	54	907
	All grass	370	73	43	45	33	178	36	57	130	15	25	417
	All crops & grass	865	83	60	62	20	171	55	68	142	33	42	1324
South West	All tillage	130	95	88	81	30	134	83	105	127	73	85	292
	All grass	505	81	75	75	48	131	38	48	106	28	36	542
	All crops & grass	635	83	78	77	44	132	48	60	110	37	46	834
Wales	All tillage	315	94	87	82	19	142	74	82	133	64	67	530
	All grass	964	78	68	69	43	119	34	46	93	23	31	678
	All crops & grass	1279	82	73	72	37	125	46	56	103	33	40	1208

Table SC3.1 Product type as percentage of all product used by crop group in Scotland 1994

column %	Spring cereal	Winter cereal	potatoes	sugar beet	oil seed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	Column % all crops & grass
Calcium Ammonium Nitrate	0.3	•	•	•	0.4	•	0.1	0.2	•	0.8	•	0.5	0.3
Urea	0.6	4.3	•	•	5.3	0.1	2.6	2.5	1.2	2.1	12.2	2.3	2.4
Ammonium Nitrate	10.5	45.4	0.2	•	34.3	5.8	25.7	22.6	16.6	17.4	•	20	22.6
Other Straight N	2.1	4	•	•	8.1	•	3.4	0.9	•	1.4	•	1.1	2.1
Triple Super Phosphate	•	0.1	•	•	•	•	•	0.6	•	0.8	•	0.7	0.4
Single Super Phosphate	•	•	•	•	•	•	•	•	•	•	•	•	•
Other Straight P	•	•	•	•	•	1.4	0.1	0.1	•	0.2	•	0.1	0.1
Muriate of Potash	0.1	0.4	0.4	•	•	•	0.2	•	•	0.2	•	0.1	0.1
Other Straight K	•	•	0.3	•	•	•	•	•	•	0.1	•	0.1	•
NP	0.1	0.5	•	•	1.4	2.5	0.6	7.3	1	5.3	•	6	3.6
NK	1.6	1.6	•	•	0.3	•	1.1	1	3	6.3	•	3.3	2.3
PK	1.6	6.6	0.9	•	2.7	2	3.6	1	0.3	2	•	1.4	2.4
Very High N	3.1	0.3	•	•	•	0.3	1.1	36.3	23.2	26.4	3.2	31.3	17.4
High N	37.9	3.5	14.6	•	9.3	17.1	17.1	23.4	39.2	21	75.6	23.4	20.5
High P	1	1	2.9	•	1.2	15	2.3	0.1	•	0.2	•	0.1	1.1
High K	13.2	0.5	47.9	•	8.4	13.7	10.8	0.4	3.3	4.2	•	2.2	6.2
Low N	6.3	30.4	21.5	•	15.3	34	20	0.5	0.6	0.7	•	0.6	9.5
Low P	1	•	•	•	0.5	0.6	0.4	1.6	5.6	8.1	•	4.5	2.7
Equal NPK	19.7	1.4	11.2	•	12.8	7.6	10.3	1.6	6.1	2.5	9	2.3	5.9
Unknown	1.1	•	•	•	•	•	0.3	•	•	0.3	•	0.1	0.2
Total prod ('000 tonnes)	115	135	32	•	59	30	372	226	24	183	1	434	806

Source: British Survey of Fertiliser Practice 1994

Table SC3.2 Use of product type by crop group in Scotland 1994

row %	('000 tonnes)												
	Spring cereal	Winter cereal	potatoes	sugar beet	oil seed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	all crops & grass
Calcium Ammonium Nitrate	11.9	•	•	•	9.2	•	21.1	21.1	•	57.8	•	78.9	2.6
Urea	3.6	29.9	•	•	16.2	0.2	49.9	28.6	1.5	19.3	0.6	50.1	19.5
Ammonium Nitrate	6.6	33.6	•	•	11.2	0.9	52.4	27.9	2.2	17.5	•	47.6	182.4
Other Straight N	13.8	31.4	•	•	27.9	•	73.2	11.8	•	15	•	26.8	17.3
Triple Super Phosphate	•	3.6	•	•	•	•	3.6	46.5	•	49.9	•	96.4	3
Single Super Phosphate	•	•	•	•	•	•	•	•	•	•	•	•	0
Other Straight P	•	•	•	•	•	40.9	40.9	29.3	•	29.7	•	59.1	1
Muriate of Potash	7.6	47.6	12	•	•	•	67.1	•	•	32.9	•	32.9	1.2
Other Straight K	•	•	23.5	•	•	•	23.5	•	•	76.5	•	76.5	0.3
NP	0.3	2.4	•	•	2.9	2.6	8.2	57.2	0.8	33.7	•	91.8	28.6
NK	9.7	11.7	•	•	0.9	•	22.3	11.7	3.9	62.1	•	77.7	18.6
PK	9.5	46.5	1.6	•	8.5	3.1	69.1	11.6	0.3	19	•	30.9	19.2
Very High N	2.6	0.3	•	•	•	0.1	2.9	58.5	4	34.6	•	97.1	140.1
High N	26.5	2.8	2.8	•	3.3	3.1	38.5	32	5.7	23.3	0.4	61.5	165.2
High P	12.9	14.7	10.1	•	8	48.3	93.9	1.4	•	4.7	•	6.1	9.2
High K	30.5	1.3	30.8	•	10	8.1	80.8	2	1.6	15.5	•	19.2	49.8
Low N	9.5	53.5	8.9	•	11.8	13	96.8	1.4	0.2	1.7	•	3.2	76.8
Low P	5.5	•	•	•	1.4	0.9	7.7	16.7	6.3	69.3	•	92.3	21.4
Equal NPK	47.6	3.9	7.5	•	15.8	4.7	79.5	7.5	3.1	9.7	0.2	20.5	47.9
Unknown	67.1	•	•	•	0.7	•	67.8	•	•	32.2	•	32.2	1.9
Total product	14.3	16.8	4	•	7.4	3.7	46.1	28	3	22.8	0.1	53.9	806

Source: British Survey of Fertiliser Practice 1994

Table SC3.3 Product use in Scotland by month of application 1994

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product (000 tonnes)
Calcium Ammonium Nitrate	•	•	12	30	24	9	10	14	•	•	•	•	3
Urea	•	4	50	27	5	4	10	•	•	•	•	•	20
Ammonium Nitrate	•	5	22	38	17	10	7	1	•	•	•	•	182
Other Straight N	•	12	30	32	23	1	1	1	•	•	•	•	17
Triple Super Phosphate	•	58	15	20	2	•	4	•	•	•	•	•	3
Single Super Phosphate	•	•	•	•	•	•	•	•	•	•	•	•	0
Other Straight P	•	•	30	•	56	•	•	•	•	•	15	•	1
Muriate of Potash	•	37	40	12	•	•	•	•	•	10	•	•	1
Other Straight K	•	76	•	24	•	•	•	•	•	•	•	•	•
NP	4	•	10	50	18	7	6	2	1	1	•	•	29
NK	•	•	8	25	11	48	4	2	•	•	•	•	19
PK	3	11	11	16	11	3	1	•	22	19	•	3	19
Very High N	•	•	19	35	17	15	7	5	1	•	•	•	140
High N	•	•	16	56	15	8	3	1	•	•	•	•	165
High P	•	•	•	40	36	5	•	3	13	3	•	•	9
High K	•	•	26	58	11	1	•	1	1	1	•	•	50
Low N	2	7	11	14	12	•	•	7	17	26	3	•	77
Low P	•	•	•	50	9	35	4	1	1	•	•	•	21
Equal NPK	•	1	28	39	18	4	•	3	5	2	•	•	48
Unknown	•	•	1	•	67	32	•	•	•	•	•	•	2
All fertilisers	•	3	19	40	16	9	4	2	3	3	•	•	806

Source: British Survey of Fertiliser Practice 1994

Table SC4.1 Average fertiliser practice – North East Scotland 1994

	Ha.* (’000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	4	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	130	99	70	71	19	171	70	75	170	49	53	234
Spring barley	12	100	74	81	16	117	41	69	117	31	56	23
Winter barley	43	100	86	87	18	141	64	74	141	55	65	86
Oats	3	•	•	•	•	•	•	•	•	•	•	9
Rye	2	•	•	•	•	•	•	•	•	•	•	3
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	0	•	•	•	•	•	•	•	•	•	•	1
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	28	97	54	56	37	149	57	68	144	31	38	53
Linseed	12	88	76	76	5	81	45	54	71	34	41	17
Forage maize	14	100	100	68	91	69	56	61	69	56	41	25
Turnips (stock)	1	•	•	•	•	•	•	•	•	•	•	5
Kale and cow cabbage	2	•	•	•	•	•	•	•	•	•	•	5
Other roots/green crops	0	•	•	•	•	•	•	•	•	•	•	0
Peas	7	30	85	85	10	14	68	69	4	57	59	11
Beans	5	•	•	•	•	•	•	•	•	•	•	6
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	3	100	•	60	•	32	•	150	32	•	90	16
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	25	81	75	61	80	76	55	66	61	42	40	40
All tillage	290	94	73	72	28	140	62	71	132	46	51	538
Grass under 5 years	113	89	58	61	48	209	50	89	186	29	54	196
Grass 5 years and over	311	75	40	43	43	123	28	37	93	11	16	409
All grass	424	79	45	48	44	149	36	55	117	16	26	605
All crops & grass	714	85	56	57	38	145	50	63	123	28	36	1143

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC4.2 Average fertiliser practice - South East Scotland 1994

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	80	100	94	95	6	204	87	91	204	82	86	196
Spring barley	86	100	99	99	7	110	60	69	110	59	68	228
Winter barley	29	100	94	95	1	183	81	82	183	76	78	77
Oats	17	100	100	100	14	90	51	56	90	51	56	38
Rye	1	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	1	.	.	.	.	.	.	.	.	.	.	5
Maincrop potatoes	14	94	94	94	34	178	210	260	168	198	244	27
Sugar beet	0	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	34	99	93	93	8	193	70	72	191	65	67	90
Linseed	2	.	.	.	.	.	.	.	.	.	.	3
Forage maize	0	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	5	100	100	100	37	86	124	103	86	124	103	22
Kale and cow cabbage	1	.	.	.	.	.	.	.	.	.	.	5
Other roots/green crops	4	.	.	.	.	.	.	.	.	.	.	9
Peas	4	30	48	48	.	15	70	76	4	33	36	12
Beans	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	2	.	.	.	.	.	.	.	.	.	.	6
Vegetables (other)	2	.	.	.	.	.	.	.	.	.	.	4
Small fruit	1	.	.	.	.	.	.	.	.	.	.	2
Top fruit	0	.	.	.	.	.	.	.	.	.	.	0
Other tillage	0	.	.	.	.	.	.	.	.	.	.	1
All tillage	284	98	95	95	9	157	80	87	153	76	83	726
Grass under 5 years	95	92	70	68	21	122	41	49	112	29	33	239
Grass 5 years and over	144	89	63	63	28	112	39	34	99	25	22	233
All grass	239	90	66	65	25	116	40	40	104	27	26	472
All crops & grass	523	94	82	81	17	139	65	70	131	54	57	1198

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

Table SC4.3 Average fertiliser practice – South West Scotland 1994

	Ha.* (*000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P ₂ O ₅	K ₂ O	FYM	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	
Spring wheat	0	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	8	100	100	100	83	208	70	71	208	70	71	13
Spring barley	25	100	100	100	53	73	48	49	73	48	49	64
Winter barley	9	89	94	94	37	136	59	60	121	56	57	22
Oats	2	.	.	.	.	.	.	.	.	.	.	6
Rye	0	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	3	.	.	.	.	.	.	.	.	.	.	5
Maincrop potatoes	0	.	.	.	.	.	.	.	.	.	.	1
Sugar beet	0	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	7	100	100	100	57	108	56	56	108	56	56	10
Linseed	0	.	.	.	.	.	.	.	.	.	.	0
Forage maize	0	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	1	.	.	.	.	.	.	.	.	.	.	4
Kale and cow cabbage	1	.	.	.	.	.	.	.	.	.	.	4
Other roots/green crops	4	.	.	.	.	.	.	.	.	.	.	5
Peas	0	.	.	.	.	.	.	.	.	.	.	0
Beans	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	0	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	0	.	.	.	.	.	.	.	.	.	.	0
Small fruit	0	.	.	.	.	.	.	.	.	.	.	0
Top fruit	0	.	.	.	.	.	.	.	.	.	.	0
Other tillage	0	.	.	.	.	.	.	.	.	.	.	2
All tillage	60	98	99	98	55	113	62	62	111	61	61	136
Grass under 5 years	107	95	91	83	70	176	48	63	167	44	53	181
Grass 5 years and over	358	89	81	76	35	116	33	39	103	26	29	606
All grass	465	90	83	77	43	131	37	45	118	30	35	787
All crops & grass	525	91	85	80	45	128	40	47	117	34	38	923

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1994

NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.