HMSO

THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS

1993

MAFF Ministry of Agriculture Fisheries and Food

FMA Fertiliser Manufacturers Association

THE SCOTTISH OFFICE Agriculture and Fisheries Department

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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) 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 1993 Survey were carried out at the University of Edinburgh; the farm interviews were undertaken by Farm Research 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

March 1994

ACKNOWLEDGEMENTS

The authors of this report have many people to thank for their assistance and support in the design, conduct and analysis of the 1993 British Survey of Fertiliser Practice.

Mórag Davidson and Lynne Jamieson worked as Project Assistants for the 1993 Survey and made significant contributions at various stages in the survey process. We would also like to thank Alison Bayley (EUDL), who provided some specialist computing assistance and advice, and Donald Morse (EUDL) who produced the maps for Section D of the report.

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 (EUDL), Graham Russell (Institute of Ecology and Resource Management, University of Edinburgh) and Martin Ragg (now at the University of Stirling).

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 Farm Reserach Ltd, especially the three supervisors (Ann Rutter, Delvia Rimmer and Marian Greenan), 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 welcome the involvement of HMSO and express our thanks to the staff of HMSO Scotland, in particular to Debbie Pope for her design input.

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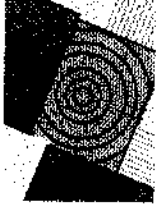


MAIN POINTS FROM THE 1993 BRITISH SURVEY OF FERTILISER PRACTICE

The survey estimates for **Great Britain** in 1993 show:

- Overall rates on all crops and grass were down slightly for N, P and K.
- Total N on tillage was down to 137 kg/ha (from 146 kg/ha in 1992), due to a sharp fall in use of straight N on major tillage crops.
- Total N on grass partially recovered to 112 kg/ha.
- Use of P_2O_5 and K_2O fell on tillage crops to 52 kg/ha and 60 kg/ha respectively.

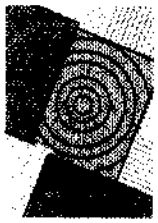
The estimates for **England and Wales** indicate:

- Total N rate on tillage crops dropped by 10 kg/ha because less straight N was used on winter barley, oilseed rape and sugar beet; changes in cropping practice also influenced N usage.
- Total N rate on grass increased by 8 kg/ha, as a greater proportion of the grassland area was dressed with at least some N (in straight form) compared with 1992; overall usage was, however, still well below the average over recent years.
- P_2O_5 and K_2O rates were marginally smaller on tillage crops but unchanged on grass where usage of both nutrients remains below the longer term average.

The estimates for **Scotland** indicate:

- Total N rate on tillage crops increased by 5 kg/ha, as more straight N was used on barley.
- Overall N usage on grass increased by 3 kg/ha, because a larger percentage of the grassland area was dressed with compound N.
- P_2O_5 and K_2O were unchanged on both tillage crops and also grass and, as for N, have not shown any definite, longer term changes.

Commentary on the 1993 Survey results with respect to longer term trends is set out in the Report. The 1993 application rates are reported in detail 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 task in providing information with which to estimate the tonnage of fertiliser used annually, particularly when used in conjunction with the estimates of crop area obtained from the annual Agricultural Census. Annual delivery statistics can be poor indicators of consumption particularly when stocks fluctuate in response to economic changes and agricultural practice. With the lack of import statistics, following changes in Custom and Excise regulations accompanying the European 'Open Market', this has increased in importance.

Rates of fertiliser application for 1993 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, product types, regions 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, P_2O_5 and K_2O 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 and Fairgrieve (1993)†. 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 one 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

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†

Burnhill, P M & Fairgrieve, J (1993) *The British Survey of Fertiliser Practice: fertiliser use on farm crops* 1992, Computing Services, The University of Edinburgh, Edinburgh 1993 ISBN 0-9513538-1-0 (£22 inc p&p)

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 pp203-21

estimates of total tonnage applied. Some estimates produced for 1991 and 1992 are at variance with one another and stand out from recent trends. While these may reflect real fluctuations in a period of change, they could also include the effect that changes in survey management in 1992 might have had on survey estimates.

SAMPLING

The 1993 British Survey of Fertiliser Practice involved the random selection of a nationally representative sample of approximately 1500 farm holdings in Great Britain (1287 from England and Wales and 252 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 farm types and, for England and Wales, by four size groups. This produced twenty 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, (Sample Design and Sampling Variation).

FIELDWORK

The farms in the sample were visited by Farm Research Ltd,who carried out interviews with farmers and farm managers between late May and August 1993, recording information on fertiliser use during the 1992–93 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 1992 to 30 September 1993 corresponding to the 1993 growing year or the post-1992 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 1992. 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 not recorded 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.

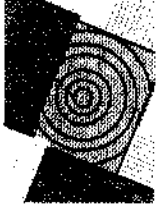
5. The abbreviation N is used for Nitrogen; P_2O_5 or P for Phosphate; K_2O or K for Potash. The phrase **total use** includes both Straight and Compound products.

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 (actual) 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.

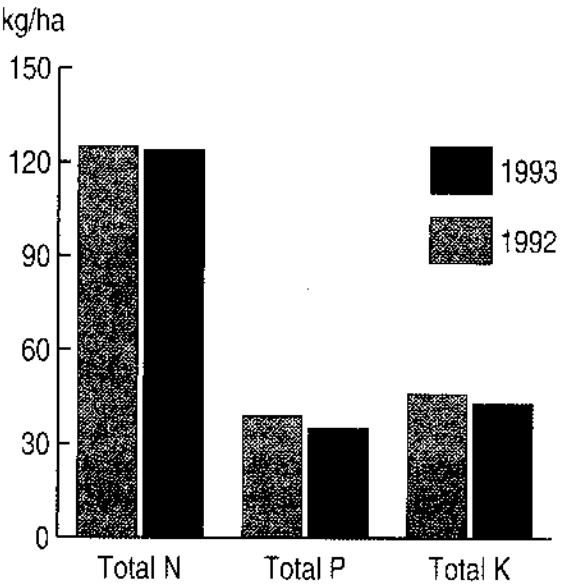


SECTION B – COMMENTARY ON THE RESULTS FROM THE 1993 SURVEY

1 – Overall fertiliser usage

GREAT BRITAIN

Figure B1.1 Overall fertiliser usage on all crops and grass, Great Britain 1992 and 1993

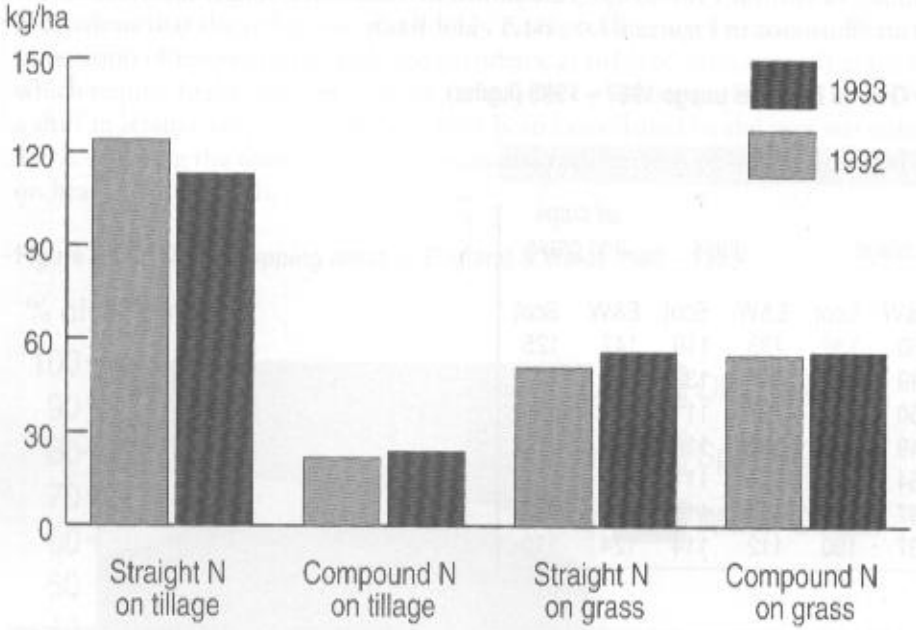


Overall application rates on total crops and grass, of all three major nutrients (N, P_2O_5 and K_2O) were slightly lower in 1993 than in 1992. (Figure B1.1 and Table B1.1). Changes in cropping practice, due to seasonal weather conditions and the introduction of the Arable Area Payment Scheme, and changes in actual fertiliser rates, particularly on grassland in England and Wales, were influential factors on overall fertiliser use.

Table B1.1 Overall fertiliser usage, Great Britain 1992 and 1993 (kg/ha)

		tillage	*grass*	*all crops and grass*
Total N	1992	146	106	125
	1993	137	112	124
Total P	1992	56	22	39
	1993	52	21	35
Total K	1992	64	28	46
	1993	60	29	43
Straight N	1992	124	51	87
	1993	113	56	82
Compound N	1992	22	55	39
	1993	24	56	41

Figure B1.2 Nitrogen Usage in Britain 1992 and 1993



N

There was an overall increase of 6 kg/ha N on grass, but a drop of 9 kg/ha N on tillage crops.

Both effects were caused largely by changes in straight N usage between 1992 and 1993; the corresponding overall rates of compound N showed only marginal increases. (Table B1.1 and Figure B1.2).

$P_2 0_5$ & $K_2 0$

The minor changes in rates of $P_2 0_5$ and $K_2 0$ were due mainly to the smaller rates on tillage crops in 1993.

These are aggregate results. More specific changes in fertiliser use are examined throughout section B.

ENGLAND & WALES

Overall fertiliser rates from 1987 to 1993 are shown in Table B1.2, longer term trends since 1970 are illustrated in Figures B1.4 , B1.5 , and B1.6.

Table B1.2 Overall fertiliser usage 1987 – 1993 (kg/ha)

TOTAL N

	tillage		*grass*		*all crops and grass*	
	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

STRAIGHT N

tillage		*grass*		*all crops and grass*		
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*

COMPOUND N

tillage		*grass*		*all crops and grass*	
E&W	Scot	E&W	Scot	E&W	Scot
25	57	58	77	41	69
24	51	55	80	39	68
20	54	57	81	39	70
18	49	64	78	41	67
16	53	64	75	39	67
15	51	49	75	32	67
19	50	49	81	35	70

TOTAL P_2O_5

tillage		*grass*		*all crops and grass*		
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*

TOTAL K_2O

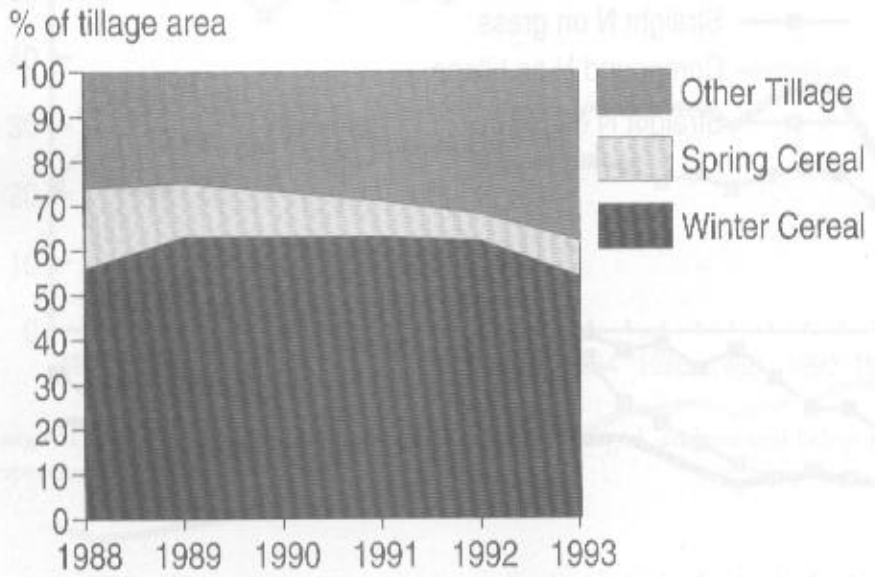
tillage		*grass*		*all crops and grass*	
E&W	Scot	E&W	Scot	E&W	Scot
63	70	33	31	48	47
63	66	30	34	47	47
60	73	34	36	48	51
62	74	36	35	49	50
62	72	35	31	49	47
59	72	26	34	43	48
58	72	27	34	42	47

N

The total N use on **all crops and grass** failed to recover in 1993, falling slightly by 2 kg/ha from 1992. There were, however, significant but contrasting changes in the overall N rates for the separate tillage and grass cropping categories. On **tillage**, the net effect of a sharp drop in straight N use and a recovery in use of compound N was a continued decline in total N use, down to 137 kg/ha. On grass use of compound N remained unchanged at the low of 49 kg/ha. However, the recovery in use of straight N of 8 kg/ha led to a partial recovery in total N use to 112 kg/ha.

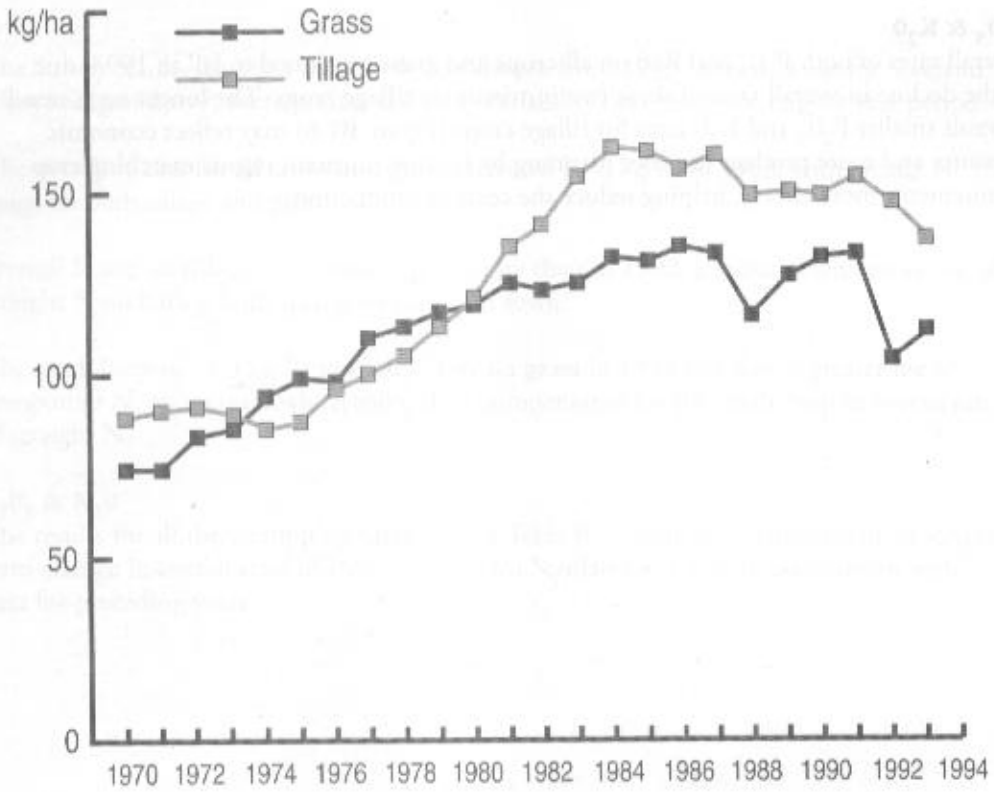
The sudden decline in total N use on **tillage crops** was mainly due to smaller N rates on winter barley, oilseed rape and, to a minor extent, sugar beet. There are also some indications that the reduction in overall N rate on tillage was an indirect effect of the imposition of rotational set-aside requirements, as fields of winter cereals and oilseed rape, which require higher rates of N, were taken out of production (Figure B1.3). The effect of a shift in relative cropping areas may have been exacerbated by the very wet autumn in 1992, reducing the total area sown to winter cereals because of waterlogged soil conditions on heavy textured soils.

Figure B1.3 Tillage cropping areas in England & Wales 1988 – 1993



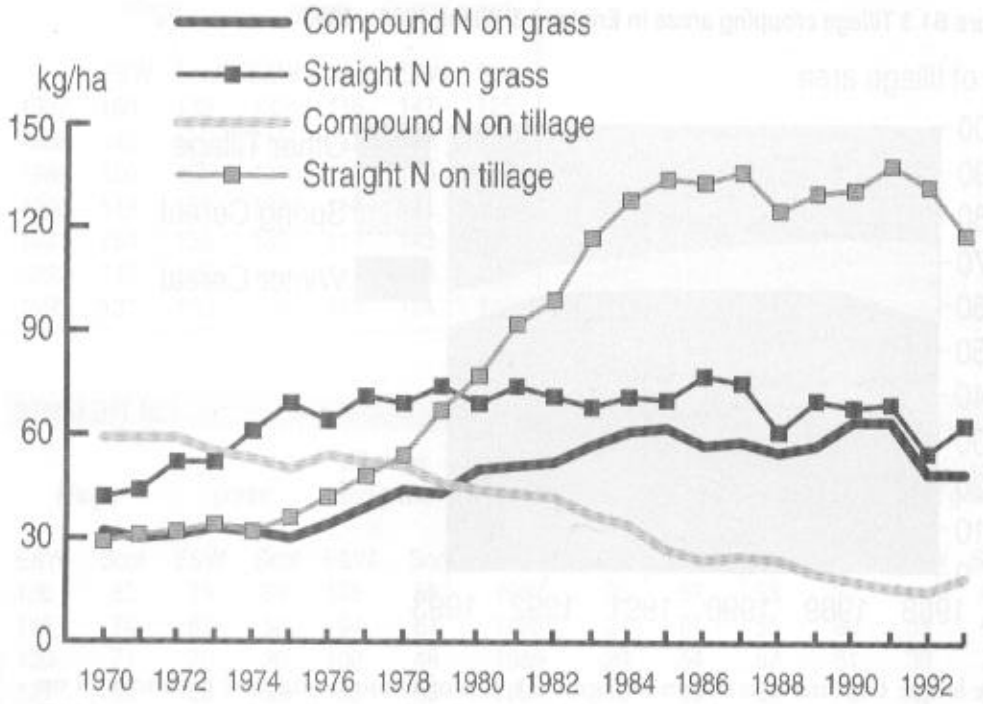
The longer term trend as shown in Figure B1.4, is of a continuing slow decline in N on tillage since the peak years between 1983 and 1985. The overall application rate of 137 kg/ha in 1993 is still higher than that prior to 1981 (Figure B1.4).

Figure B1.4 Overall use of nitrogen in England & Wales 1970 – 1993



Total N use on grass showed a partial recovery in 1993 following the dramatic drop in N usage between 1991 and 1992, with an increase of 8 kg/ha N which was related to greater use of straight N fertiliser. The recovery in overall N rate was due to an increase in the percentage dressing cover across all grassland, rather than any major change in average field rate. The overall rate for 1993 remains well below the average for the 1989-91 period (Table B1.2 and Figure B1.4).

Figure B1.5 Overall use of straight and compound N in England & Wales 1970 – 1993

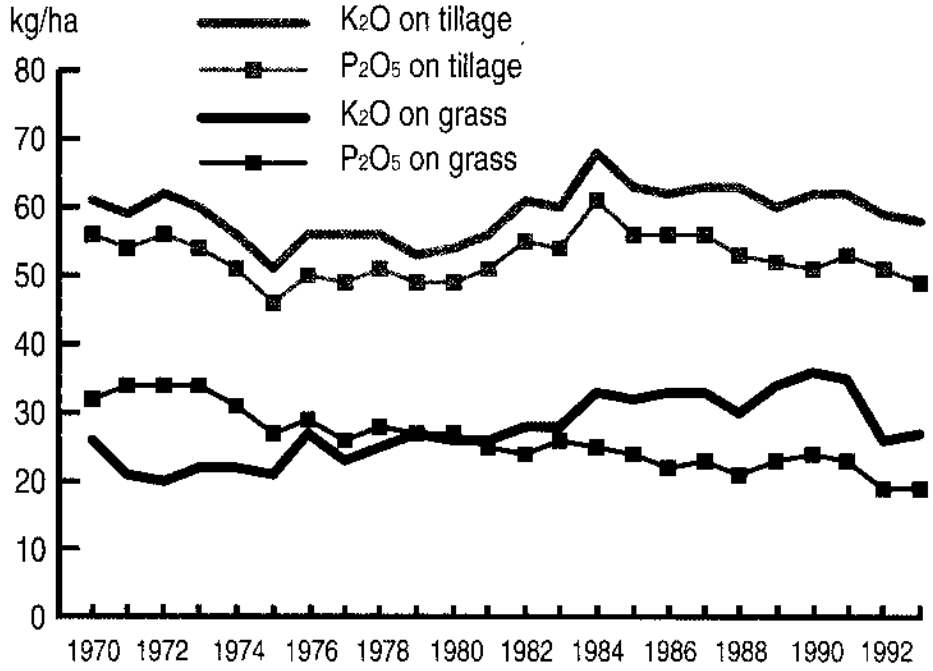


The different long-term trends for straight N and compound N on tillage are quite marked (Figure B1.5). The long-term decline in compound N is very evident, despite the increase in 1993.

P_2O_5 & K_2O

Overall rates of both P_2O_5 and K_2O on all **crops and grass** continued to fall in 1993, due to the decline in overall rates of these two nutrients on **tillage** crops. The longer term trend towards smaller P_2O_5 and K_2O rates for tillage crops (Figure B1.6) may reflect economic pressures and more prudent fertiliser planning by farmers, nutrient inputs matching crop requirements more closely, helping reduce the costs of production.

Figure B1.6 Overall use of P_2O_5 and K_2O England & Wales 1970 – 1993



Usage of both P_20_5 and K_20 on grass remained unchanged, and are still below the respective averages for recent years.

SCOTLAND

Overall nutrient rates from 1987 to 1993 are shown in Table B1.2. The longer term trends since 1983, when the Scottish Survey started, are summarised in Figures B1.7 , B1.8 and B1.9 (overleaf).

N

The Survey results for 1993 show little real change from 1992 in total N use for Scotland when compared with average rates and their variability over the preceding six year period.

The overall N rate for **all crops and grass** increased by 3 kg/ha in 1993, with greater N usage on both tillage and grass.

Overall N use on **tillage** crops was 5 kg/ha more than in 1992, associated with more use of straight N on barley, both spring and autumn sown.

The small increase of 3 kg/ha in total N rate on **grass** in 1993 was due to greater use of compound N, an increase which more than compensated for the small drop in overall rate of straight N.

P_20_5 & K_20

The results for all three cropping categories in Table B1.2 indicate no immediate or longer term change in overall rates of P_20_5 and K_20 for Scotland in 1993, in comparison with data for preceding years

Figure B1.7 – Overall use of Nitrogen, Scotland 1983 – 1993

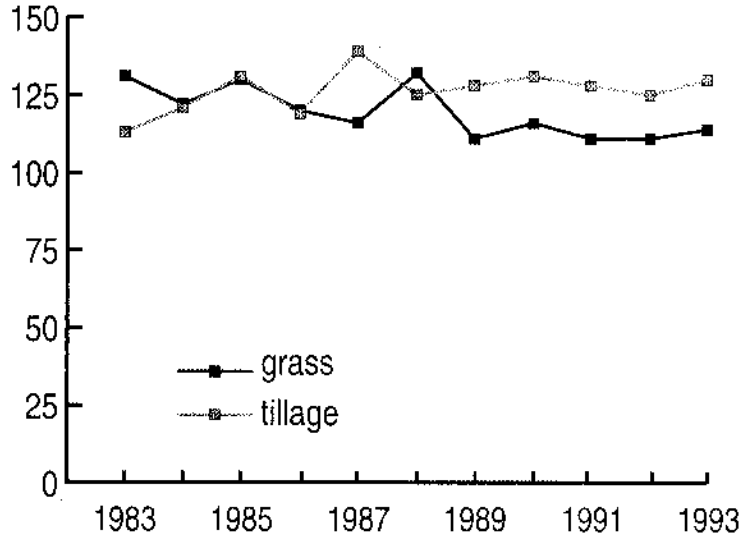


Figure B1.8 – Overall use of straight and compound N, Scotland 1983 – 1993

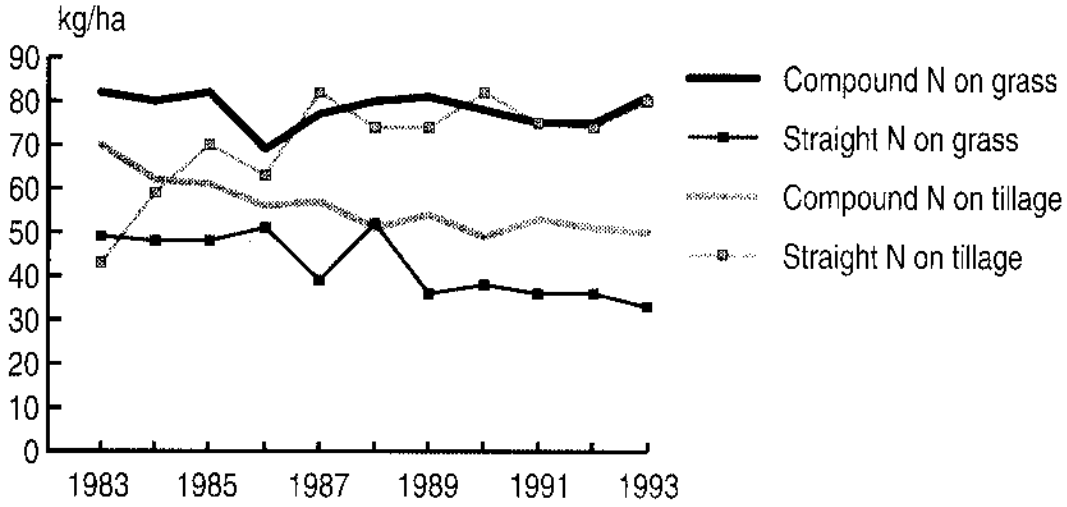
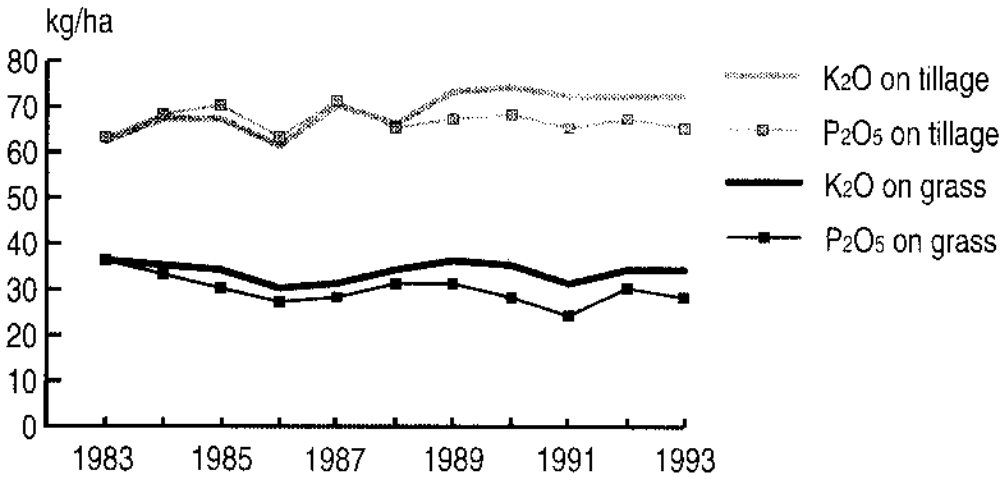


Figure B1.9 – Overall use of P_2O_5 and K_2O, Scotland 1983 – 1993



2 – Fertiliser use on major tillage crops

Estimates of overall fertiliser use for the major tillage crops from 1988 to 1993 are shown in Table B2.1. Equivalent estimates for average field rates of application are given in Table B2.2. The results from the 1993 Survey are presented in more detail 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 groupings of 'tillage', 'grass' and 'all crops and grass'. Information on 'sampling errors', which help when 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 a small trend away from the use of agricultural land for tillage cropping over recent years, the shift in 1993 towards grass more noticeable in Scotland. Since 1988, the Survey results indicate an overall decrease in the proportion of the tillage area cropped with spring cereals, except for the 1993 season when weather conditions may have been an overriding factor. At the same time, the proportion of other tillage cropping has gradually increased, both in England and Wales and in Scotland.

Figure B2.1 England & Wales

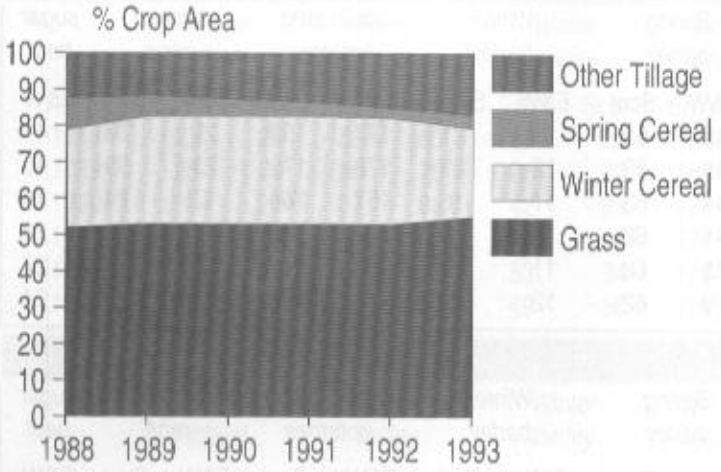


Figure B2.2 Scotland

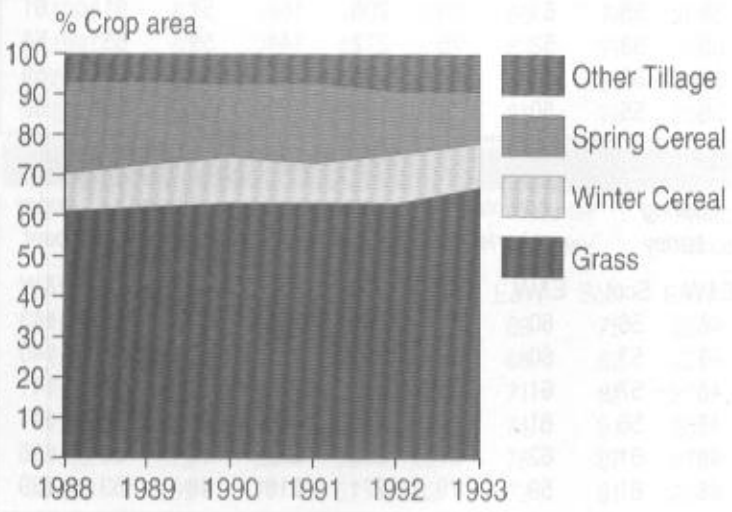


Table B2.1 Overall fertiliser usage on major tillage crops 1988 – 1993 (kg/ha)

TOTAL N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	189	201	102	93	146	179	205	159	244	234	121
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

STRAIGHT N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	181	183	57	30	134	158	28	0	215	201	80
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

COMPOUND N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	8	18	45	63	11	21	177	159	29	33	41
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

TOTAL P_2O_5

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	54	71	40	56	54	68	221	159	59	62	65
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

TOTAL K_2O

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	53	74	46	56	60	71	283	227	59	66	143
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

Table B2.2 **Average field rates on major tillage crops 1988 – 1993 (kg/ha)**

TOTAL N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	191	203	104	93	141	179	208	159	248	234	123
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

STRAIGHT N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	185	189	88	63	139	160	96	0	223	206	102
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

COMPOUND N

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	25	27	59	65	30	28	185	159	46	41	97
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

TOTAL P_2O_5

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	64	78	45	56	62	71	224	159	64	67	73
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

TOTAL K_2O

	Winter wheat		*Spring barley*		*Winter barley*		*main crop potatoes*		*oilseed rape*		*sugar beet*
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W
1988	67	82	52	56	69	75	284	227	67	71	146
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

ENGLAND AND WALES

Average N use dropped in 1993 on **oilseed rape** and **sugar beet**, continuing the same trends observed over recent years. Average N use also fell for **winter barley**. These reductions were associated with less use of straight N. Application of N to winter cereals and winter oilseed rape during the autumn and winter period has also continued to decline. Use on **maincrop potatoes** is up. No significant changes occurred in P_2O_5 and K_2O use on the major tillage crops, but several crops showed minor differences in overall rates when compared with 1992.

N

Total N use on major tillage crops continued to fall in 1993. The overall rate of N on **winter wheat**, however, steadied (Table B2.1) despite a small, but statistically significant, drop in the average field rate (Table B2.2). Compound N usage increased on winter wheat, suggesting a partial switch from use of straight N to compound N products, as a means of applying an early spring top dressing of N and annual maintenance P_2O_5 and K_2O requirements at the same time.

The Survey indicates considerable variations between farms in the rate of application of N on field crops, although this is less for winter wheat than for other crops. This variation, which is due to such factors as soil type, previous cropping, the weather variation and differences in farm practice, is illustrated in Tables B2.3 and B2.4. In 1993 nearly half (44%) of the winter wheat crop area received between 150 kg/ha and 200 kg/ha, a further third being treated at 200 kg/ha to 250 kg/ha. The survey data show that a stable distribution in the rate of N application on winter wheat over the three years 1991 – 1993 is represented well by the Survey.

The decrease of 6 kg/ha in N on **winter barley** in 1993 was preceded by a more gradual decline over the previous six years. The sharp decline, which may have been caused by a greater proportion of the 1993 crop area being grown for malting rather than the feed market, is due to an increase, since 1991, in the lower rates of application reported in Table B2.3. The increase of 6 kg/ha in straight N use and the corresponding decrease in compound N on **spring barley** in 1993 were due to changes in dressing cover rather than in the average field rate.

Total N use on **oilseed rape** dropped further in 1993. It had dropped sharply in 1992, largely due to a fall in the higher rate of application (see Table B2.3). This drop was attributed to the transitional Oilseeds Scheme, which reduced rapeseed commodity prices appreciably and therefore also fertiliser N requirements. When oilseeds were incorporated within the Arable Area Payment Scheme in 1993, N recommendations remained unchanged. However, spring sown oilseed rape, with its lower yield potential, requires less fertiliser N than the autumn sown crop. The further drop of 19 kg/ha N in 1993 may, consequently, be due in part to the large increase, compared with previous years, in the proportion of the oilseed rape cropping area that was spring (now 33%), rather than autumn (now 67%) sown (MAFF, 1993).[1] The average field rate of straight N on oilseed rape in 1993 was much lower than in earlier years: 172 kg/ha compared to 223 kg/ha in 1988.

The further reduction in N rate on **sugar beet**, dropping by 5 kg/ha in 1993, is due to a fall in high rates of N application (shown in Table B2.3) and to less use of compound N. Use of straight N also fell slightly in 1993, but the average field rate of 105 kg/ha remained the same as 1988/89. This may reflect greater awareness that farmers had from a promotional campaign on the adverse effect of excessive N input on sugar quality. It might also be that farmers took more account than hitherto of existing soil N supply from previous cropping or organic manure dressings.

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

Recent trends in the application of fertiliser N to **winter cereals** and **oilseed rape** during the August to January period are summarised in Figure B2.3. The Survey results show a general trend between 1988 and 1993 towards lower use of N overall on these 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; that, in most situations, autumn N applications do not give economic yield responses for winter cereals and also increase the potential for nitrate leaching losses during the winter period when growth is very limited and crops have little need for N. The average field rate of N, nevertheless, increased for winter cereals over the period. The isolated increase in average field rate which is evident in Figure B2.3 for winter cereals in 1992 was attributed to the exceptional proportion of the first split dressing of spring N which was applied in January, when soil and weather conditions encouraged farmers to start spreading N fertiliser prematurely, rather than at the normal recommended time between mid-February and early March at the start of spring growth. Seedbed N at 30 kg/ha is still recommended for winter oilseed rape unless the soil N fertility is high. In practice, however, only about half of the crop area receives an autumn N dressing.

P_2O_5 & K_2O

Application rates of P_2O_5 and K_2O on major tillage crops have tended to remain static and no major changes occurred in 1993. Overall P_2O_5 rates on **winter barley** and **oilseed rape** both dropped slightly in 1993, but only back to the same levels of use estimated several years previously. P_2O_5 use on potatoes remained the same as in 1992, still well below the previous average rate over several earlier years since 1987.

Overall use of K_2O in 1993 was down on **winter wheat** and **oilseed rape** and at the lowest level for these two crops over the 1987-93 period. K_2O use on **spring barley** recovered in 1993, after a small drop in overall rate in 1992.

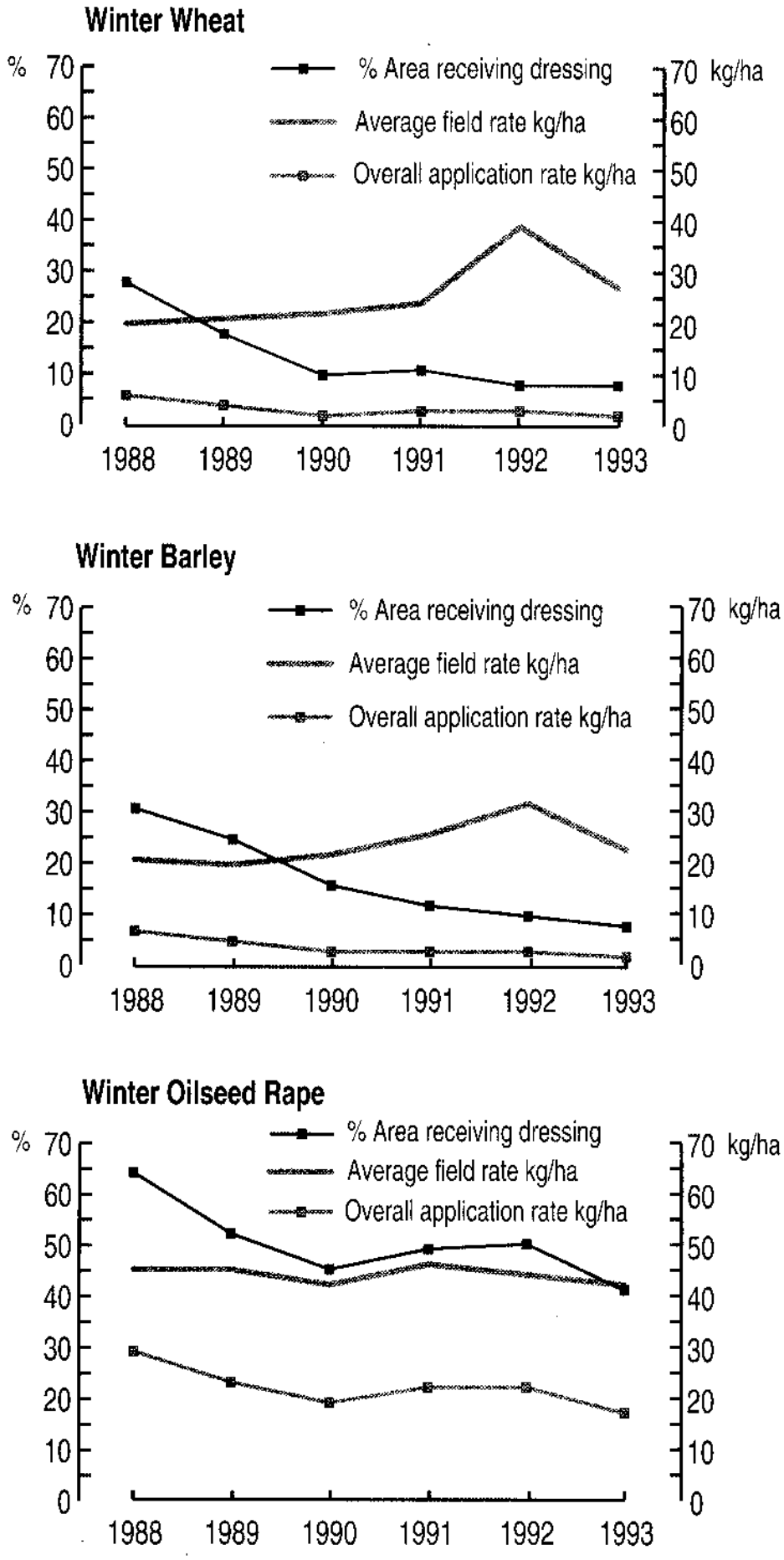
Table B2.3: Distribution of field application rates of non major tillage crops and grassland (England & Wales 1991 -1993)

row %		kg/ha													
		0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Average rate	Overall rate	'000 ha*
Winter wheat	1991	•	•	•	1	2	3	10	46	33	3	1		187	186	1962
	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
Spring barley	1991	1	•	10	29	25	22	12	1	•	•	•	•	90	89	218
	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
Winter barley	1991	•	•	•	2	15	18	27	33	3	1	•	•	139	138	818
	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
Maincrop potatoes	1991	1	•	2	4	2	6	7	29	34	11	4	•	192	191	75
	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
Sugar beet	1991	4	1	3	3	11	23	37	11	5	1	•	•	127	122	196
	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
Oilseed rape	1991	•	•	1	•	•	1	2	20	50	21	5	•	227	227	412
	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
All tillage	1991	7	•	2	5	8	8	13	30	21	4	1		166	154	4393
	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
All grass	1991	18	2	11	11	8	8	7	10	8	8	8	3	161	133	4261
	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

*estimated area under crop

Source: British Survey of Fertiliser Practice 1991, 1992, 1993

Figure B2.3 Application of N during the period August to January England & Wales 1988 – 1993



SCOTLAND

No major changes occurred in fertiliser use on major tillage crops in Scotland during 1993, compared with estimated usage over the previous six years. The cutback in overall N rate on oilseed rape in 1992 was maintained in 1993. Farmers in Scotland continued to make use of relatively more compound than straight fertiliser dressings when compared with farmers in England and Wales.

N

The overall N rate on **winter wheat** dropped by 4kg/ha in 1993, to the lowest level in recent years. Overall N use showed signs of recovery on **winter barley**, with an increase of 7 kg/ha, as more straight N was applied. However, the total N rate of 150 kg/ha was still less than the estimates for the years from 1987 to 1991. The figures on the distribution of field application rates of N across crop area shown in Table B2.4 suggest greater uniformity in the application rate of between 150 kg/ha and 250 kg/ha. N use on **spring barley** showed signs of recovery back to the 1988 level of usage, largely due to an increase in use of straight N.

N use on **oilseed rape** dropped in 1992 for the same reasons as outlined in the preceding section for England and Wales. As shown in Table B2.4, the drop in very high rates of application and the increase in the lower rates was maintained in 1993. The drop of 7 kg/ha in overall N rate in 1993 may have been influenced by the proportion of the crop area that was spring, rather than autumn sown.

There is no significant application of straight N on **maincrop potatoes** in Scotland, nor is there any major production of **sugar beet.**

P_2O_5 & K_2O

Overall application rates of both nutrients in 1993 were generally within the range of estimated values for each major tillage crop since 1987. Annual estimates for a given nutrient and crop show larger variation than for equivalent England and Wales figures because of the smaller sample size.

P_2O_5 use on **cereals** showed an apparent increase in 1993, but only back to levels reported for some earlier years between 1987 and 1993. The overall P_2O_5 rate dropped by 7 kg/ha on **oilseed rape** to its lowest level for the past seven years. Despite a decrease of 19 kg/ha compared with 1992, P_2O_5 use on **potatoes** remained well within the recent range of fluctuating values for this crop.

Overall K_2O rates for the individual major tillage crops except **spring barley**, were variable, relative to 1992 figures. Apart however from **oilseed rape**, which at 63 kg/ha was well down from previous years, the K_2O rate for each crop in 1993 was within the range of recent estimates.

Table B2.4: Distribution of field application rates of N on major tillage crops and grassland (Scotland 1991 – 1993)

row%		kg/ha												Average rate	Overall rate	'000 ha*
		0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+			
Winter wheat	1991	•	•	•	•	1	1	10	36	40	9	2	•	202	202	111
	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
Spring barley	1991	1	•	10	28	30	18	12	1	•	•	•	•	89	89	285
	1992	•	2	3	16	38	30	8	2	1	•	•	•	93	92	335
	1993	•	1	5	14	33	35	11	1	•	•	•	•	94	94	312
Winter barley	1991	•	•	•	•	2	4	19	45	26	4	•	•	179	179	56
	1992	•	•	•	1	4	5	34	36	16	•	3	•	165	165	98
	1993	2	•	•	•	3	4	14	55	21	1	•	•	172	172	63
Maincrop potatoes	1991	8	•	•	12	•	•	24	40	6	9	•	•	162	148	10
	1992	3	•	•	•	6	10	31	37	12	2	•	•	156	152	29
	1993	3	1	•	•	1	10	18	48	13	6	•	•	155	163	35
Oilseed rape	1991	•	•	1	1	•	2	6	17	37	31	5	1	227	227	45
	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
All tillage	1991	2	1	8	17	17	10	11	14	13	5	1	•	131	128	612
	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
All grass	1991	17	1	16	14	9	7	9	11	6	6	4	1	133	111	987
	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

+ Obtained directly from 1993 Agricultural Census

* Estimated area under crop

Source: British Survey of Fertiliser Practice 1991, 1992, 1993

GREAT BRITAIN

The increase of 6kg/ha for N use in Great Britain to 112 kg/ha in 1993 (Table B1.1) was largely due to the partial recovery in N application rate to grass in England and Wales. Overall rates of $P_2 0_5$ and $K_2 0$ were essentially the same as the 1992 estimates, remaining below the levels determined over the 1989 – 91 period.

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 1987 – 1993 (kg/ha)

	Straight N		Compound N		Total N	
	E&W	Scot	E&W	Scot	E&W	Scot
1987	75	39	58	77	133	116
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

Table B3.2 Dressing cover on grassland 1988 – 93 (%)

	Straight N		Compound N		Total N		Total P		Total K	
	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot	E&W	Scot
1988	*45	48	*50	80	80	92	62	82	62	79
1989	*50	30	*62	78	85	90	65	81	66	78
1990	50	35	63	76	85	87	65	76	66	75
1991	49	34	60	75	82	83	62	75	64	73
1992	41	31	59	69	75	83	55	75	55	71
1993	48	32	55	75	80	84	57	77	58	74

* based on a summary of figures published in earlier Reports

Table B3.3 Average field rates of N on grassland 1988 – 1993 (kg/ha)

	Straight N		Compound N		Total N	
	E&W	Scot	E&W	Scot	E&W	Scot
1988	*135	108	*91	100	•	143
1989	*136	103	*90	104	•	123
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

* based on a summary of figures published in earlier Reports

ENGLAND & WALES

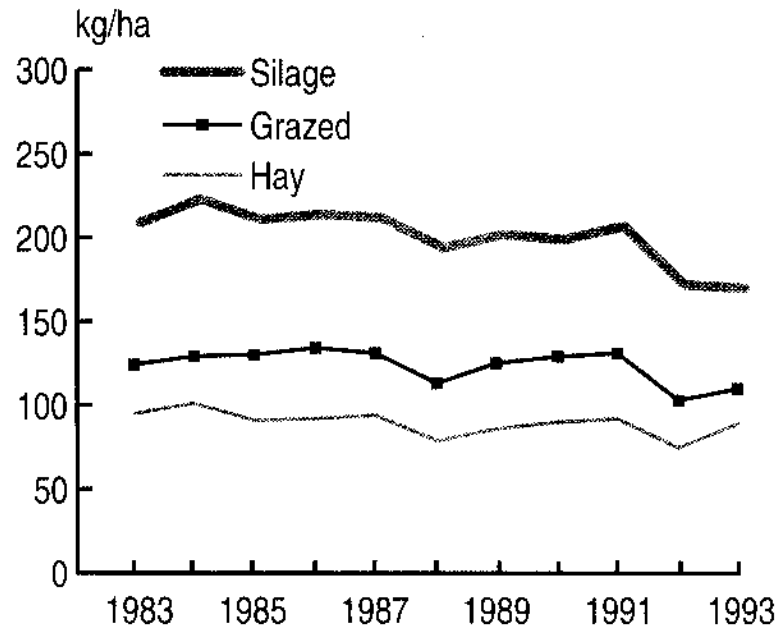
Overall N use (more particularly straight N) showed a partial recovery in 1993. Nevertheless, the estimated rate of 112 kg/ha remains well below the longer term average of around 130 kg/ha, although only slightly less than the 116 kg/ha reported for 1988. Total N use on silage was unchanged from 1992, when the overall application rate dropped by about 30 kg/ha compared with previous estimates. N use on grass for hay recovered to a similar level for the average estimate over 1989 – 91. The estimates for P_2O_5 and K_2O use in 1993 would seem to confirm a decline on grass whether used for grazing, for silage or for hay.

N

Total N use recovered from the major drop in 1992, rising by 8 kg/ha to 112 kg/ha in 1993 for **all grass**. This was entirely because of an increase in straight N. The partial recovery in 1993 in the overall rate of N was mainly due to a greater proportion of permanent grassland receiving at least some fertiliser N in 1993 compared with the previous year, corresponding to an increase in dressing cover from 75% in 1992 to 80% (Table B3.2).

Overall and average field rates of fertiliser vary according to grass utilisation, as shown in Table B3.5. Nearly all farm grassland is grazed to some extent: grass used for grazing purposes in England and Wales recovered in 1993 to 96% (Table B3.4). Over a quarter (29%) of grass is used in silage production; 12% is used for hay. In general, the pattern of grass utilisation and cutting regimes has remained similar over a long period. The longer term annual trends in overall N rates are illustrated in Figure B3.1.

Figure B3.1 Nitrogen use by grass utilisation England and Wales 1983 – 1993



The partial recovery in overall N use on total grass in 1993 can mostly be attributed to the increase of 7 kg/ha on **grazed** grass, although the total rate of 110 kg/ha N is still about 20 kg/ha below estimated usage in 1990 and 1991 (Table B3.1). As noted this increase was largely due to the increase in the proportion of grass that was dressed with N. There was also some slight recovery in the average field rate, back towards the rate in 1988.

Grassland cut for **silage** receives large amounts of N. In 1992, N use on **silage** had dropped appreciably to 172 kg/ha, remaining at a similar level (170 kg/ha) in 1993. The below average N use over the past two years for silage production might be explained by good yields of grass at first and second cut, with little need for fertiliser applications later in the season when favourable weather conditions produced sufficient grass for any remaining conservation requirements. There was also a continuing decline in the average field rates of Total N on grass for silage, down to a low of 178 kg/ha (Table B3.5).

Only 12% of grass is cut for **hay** which is dressed much less heavily with N. N use recovered to 89 kg/ha in 1993, similar to estimates prior to 1992, and largely due to an increase in the average field rate (Table B3.5).

Overall N use, however, remains appreciably less than in recent years, except for 1988. It is difficult to discover the exact reasons for this. In 1988 the dressing cover was also low, at 80%, resulting in a low overall rate of total N use of 116 kg/ha, as shown in Figure 1.4 (on page 7), exceptional to the general trend. At that time it was suggested that farmers may have cut back on fertiliser applications later on in the season because there were early indications of abundant grass production. Changes in the type and pattern of livestock production could also be a contributing factor in the extent of dressing cover.

The proportion of the grassland area which was dressed with straight N recovered to the levels of cover prior to 1992, but the percentage of dressing cover with compound N showed a small decrease in 1993, perhaps related to less use of compound N on silage fields. The average field rate continued to fall for both straight N and compound N use on grass (Table B3.3).

P_2O_5 & K_2O

In 1993 the overall rates of P_2O_5 and K_2O on **grazed** and **cut** grass remained generally unchanged at the lower 1992 rates (Table B3.1). Overall use of P_2O_5 and K_2O on **all grass** consequently remains below average compared with estimates since 1988 (Table B1.1). Despite a slight increase in the percentage of dressing cover for both of these nutrients (Table B3.2), the average field rates have not recovered.

Table B3.4 Grassland utilisation 1988 – 1993

PERCENTAGE OF GRASS AREA

	grazed[1]		*silage*[2]		*hay*[2]	
	E&W	Scot	E&W	Scot	E&W	Scot
1988	96	98	27	24	13	9
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

Table B3.5 Fertiliser application rate by grass utilisation 1988 – 1993

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
133	112	194	196	79	100	*1988*	141	126	203	198	98	107
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

TOTAL P (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
20	26	31	46	20	28	*1988*	34	33	39	49	32	35
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

TOTAL K (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
29	22	61	68	23	29	*1988*	46	29	74	74	65	39
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

[1] may also be cut

[2] may also be grazed

SCOTLAND

Total N use increased slightly in 1993, due primarily to appreciably more N application on grazed grass. Although $P_2 0_5$ use was slightly less than in 1992, the longer term trends for $P_2 0_5$ and $K_2 0$ are fairly static .

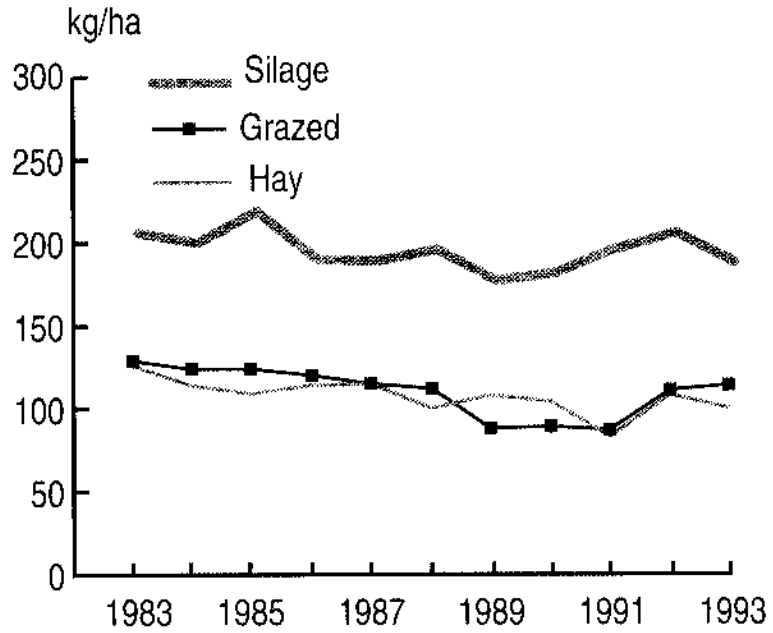
N

There is little to suggest drastic change over recent years in N use on grass, the reported changes could be viewed as random fluctuations about an unchanged average . For example, although total N apparently increased by 3 kg/ha in 1993 (to 114 kg/ha) this was within the bounds of sample variation. Nevertheless, there is some evidence for an increase in use of compound N, due to an increase in dressing cover (Table B3.2) rather than any change in average field rate (Table B3.3). Any increase in compound N use was offset by a decrease in straight N use, apparently due to a large fall in the average field rate.

More grass was apparently cut for **silage** than usual in 1993, but the proportions of grassland that were **grazed** or cut for **hay** were the same as in previous years (Table B3.4).

Overall total N use on **grazed** grass was, at 114 kg/ha, at its highest level over recent years, due in large part to an increase in the average field rate to 134 kg/ha, almost the same as that reported for England and Wales. The equivalent estimates for **silage** and **hay** in 1993 were within the respective ranges obtained since 1988.

Figure B3.2 Nitrogen use by grass utilisation Scotland 1983 – 1993

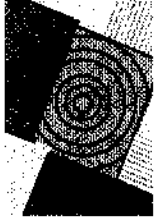


$P_2 0_5$ & $K_2 0$

No significant changes occurred in overall rates of these two nutrients on all **grass** although the $P_2 0_5$ rate showed an apparent drop of 2 kg/ha in 1993.

The longer term trends also show static levels of $P_2 0_5$ and $K_2 0$ use (Table B3.5).

Any apparent changes from 1992 in overall application rates of grassland management were very minor, compared with annual fluctuations over preceding years; the largest change was a drop of 7 kg/ha in overall $K_2 0$ use to 35 kg/ha on grass for **hay**, this level was, however, still within the range of rates estimated since 1988 (Table B3.5).



SECTION C – SAMPLE DESIGN AND SAMPLING VARIATION

The 1992 and 1993 British Surveys of Fertiliser Practice shared the same sampling design, nationally representative samples providing 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 'simple random sampling'. The design is similar to that used by Rothamsted Experimental Station in previous years.

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 four farm type 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 below.

Table C1: Sampling Characteristics of British Survey of Fertiliser Practice 1993

	farm holdings in population in 1992	total crops & grass in 1992	notional sampling fraction	target sample size	achieved sample size	achieved sample fraction
		column %	%			%
ENGLAND & WALES						
Livestock						
(MAFF groups 1 – 7)						
crops & grass area 20-50 ha	18507	6.28	0.49	91	91	0.49
51-100 ha	20450	13.96	0.97	198	195	0.95
101-200 ha	9323	12.14	1.86	170	169	1.81
200+ ha	2531	7.67	4.26	105	100	3.95
Crops & mixed						
(MAFF groups 8+9+13)						
crops & grass area 20-50 ha	2246	0.80	0.50	109	108	4.80
51-100 ha	5109	3.80	1.05	51	51	1.05
101-200 ha	6966	9.70	1.97	135	132	1.89
200+ ha	4992	17.73	5.03	242	228	4.56
Fruit, horticulture & veg.						
(MAFF groups 10+11+12)						
crops & grass area 20-50 ha	1351	0.42	*0.88	11	10	0.73
51-100 ha	707	0.48	*1.99	14	11	1.55
101-200 ha	372	0.51	*3.79	13	13	3.79
200+ ha	272	0.99	*10.29	23	21	7.72
			*double sampling			
Part-time						
(MAFF group 14)						
crops & grass area 20-50 ha	21068	6.33	0.42	86	82	0.38
51-100 ha	4460	2.82	0.89	34	33	0.73
101-200 ha	303	0.37	1.81	5	4	1.32
200+ ha	11	0.02	–	0	0	–
SCOTLAND						
LFA cattle & sheep						
(SOAFD group 1 to 3)	4637	4.26	1.48	70	70	1.48
Other livestock						
(SOAFD group 5+7+82)	3387	3.25	1.56	54	54	1.56
Crops/horticulture/mixed						
(SOAFD group 4+6+81+83)	5265	6.23	1.91	100	99	1.88
Part-time						
(SOAFD group 9)	3834	1.68	0.65	28	28	0.73
Total for Great Britain	**115,791**	**100%**		**1,539**	**1,499**	

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.

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, 1,499 farms were successfully surveyed, an achieved 'sampling fraction' of 1.3% of farms and 19% of farmed area.

Table C2: Summary Sampling Characteristics 1993

	farm holdings in population in 1992	total crops & grass in 1992 (million hectares)	target sample size	achieved sample size	achieved samping fraction (%)
England & Wales	98,668	8.6	1,287	1,248	1.3
Scotland	17,123	1.6	252	251	1.5
Great Britain	115,791	10.2	1,539	1,499	1.3

Note that the farms were stratified according to information collected in the 1992 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 1539 farms in the target sample for the 1993 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 1499 farms: 1291 of these responses were from the 'main' sample and 208 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 reduce 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) of 86% to the main sample is the most appropriate for comparison with other surveys.

Table C3: Response to Main and Reserve Samples

issued from Main Sample	1539			
response to Main Sample	1291		crude response rate	83.9%
non-response	248	of which 43 invalid	**net response rate**	**86.3%**
issued from Reserve Sample	248			
response to Reserve Sample	208		crude response rate	83.8%
non-response	40	of which 4 invalid	**net response rate**	**85.2%**
achieved sample size	1499		achieved rate	97.4%

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 lack of bias. Reliability is easier to assess. By reliable is meant the similarity between the results obtained from the selected sample 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 C4 Standard errors for application rates for the major crops in 1993

ENGLAND & WALES

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	str'l N	comp N	total P_2O_5	total K_2O	total N	str'l N	comp N	total P_2O_5	total K_2O	
Winter wheat	0.6	1.3	0.8	1.1	0.9	0.5	0.8	2.0	1.5	0.9	2854
Oilseed rape	1.8	2.3	0.6	1.1	1.1	1.5	1.4	1.5	0.3	0.5	564
Winter barley	1.1	0.9	0.9	0.3	0.8	1.1	0.5	0.8	0.3	1.2	1017
Spring barley	0.6	1.3	1.3	1.1	2.1	1.0	0.9	0.5	0.5	1.5	577
M C potatoes	1.4	3.1	6.1	3.0	5.6	1.6	8.1	2.8	3.5	3.8	306
Sugar beet	1.2	1.2	0.7	3.0	1.3	1.0	0.3	1.4	3.5	1.4	469
All tillage crops	0.9	1.2	0.3	0.2	0.7	0.6	1.0	0.9	0.2	0.8	7956
All grass	2.0	1.0	1.2	0.6	0.9	1.2	1.5	1.1	0.4	0.8	4934

SCOTLAND

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	str'l N	comp N	total P_2O_5	total K_2O	total N	str'l N	comp N	total P_2O_5	total K_2O	
Winter wheat	2.6	1.6	1.7	2.9	2.3	2.3	0.4	1.5	2.2	1.6	279
Oilseed rape	7.3	10.5	3.6	1.5	2.1	7.3	5.0	4.1	2.2	2.5	128
Winter barley	3.5	5.6	2.3	1.7	1.3	2.5	2.3	3.0	1.4	0.9	97
Spring barley	1.3	1.8	0.6	1.0	1.6	1.4	1.5	1.0	1.0	1.7	513
M C potatoes	3.7	1.2	2.8	2.6	3.8	3.2	5.7	2.2	1.7	3.2	68
All tillage crops	0.5	0.9	0.5	0.5	0.6	0.4	0.9	1.1	0.3	0.7	1316
All grass	1.6	1.3	1.1	0.5	1.5	1.4	7.2	1.4	0.6	1.9	1104

The size of the 'standard error' is influenced by several factors, some of which vary across years. Changes in sample design, such as the number of farms in the sample, have been kept to a minimum. 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 acceptable 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 1993, in England and Wales, for example, the estimated overall application rate of total Nitrogen use on Winter wheat was 184 kg/ha (from Table B2.1 on page 12). The low value of the corresponding standard error of 0.6 kg/ha, relative to the 184 kg/ha indicates very high reliability (good precision), a 'relative error' near to 0.33% (the ratio 0.6 to 184, 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 110 kg/ha, with a corresponding standard error of 1.2 kg/ha, a 'relative error' of 5.2%. The application of N on kale and cow cabbage is estimated with much less precision: 89 kg/ha with a corresponding standard error of 4.6 kg/ha (not shown in Table A3.4), with a much larger 'relative error' of 13.4% – 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 wheat N would have a narrower Confidence Interval: with lower bound 182.8 (184 – 2 x 0.6) and an upper bound of 185.2 (184 + 2 x 0.6). 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 Straight N on sugar beet in 1993 was estimated at 86 kg/ha, an apparent fall from 88 kg/ha in 1992. The difference is 2 kg/ha. The standard error in 1993 was 1.2 kg/ha. The observed difference of 2 kg/ha is less than 3 times 1.2 (= 3.6) kg/ha and therefore could well be attributable to sampling variation alone – indicating not much evidence of real world change. In 1991, the rate was 93 kg/ha, so the apparent fall in 1993 may be part of a trend.

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. The approximation used above, only taking note of differences greater than three times standard error, assumes that the standard error of each estimate was the same. A comparison with earlier Reports would suggest that such an assumption may not always hold, as the 1992 and 1993 standard errors reported are generally less than those reported for earlier years, despite only minor changes in the sampling design. What has changed,

however, is the method of estimating the standard errors (see below). We believe that the standard errors reported in 1992 and 1993 are the more accurate measures of sample survey variability, although as explained below there may be less reliable for a given year.

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, drawn 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 Station[1], and used for surveys prior to 1992 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 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 1993 British Survey of Fertiliser Practice 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 1993 Survey, 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.

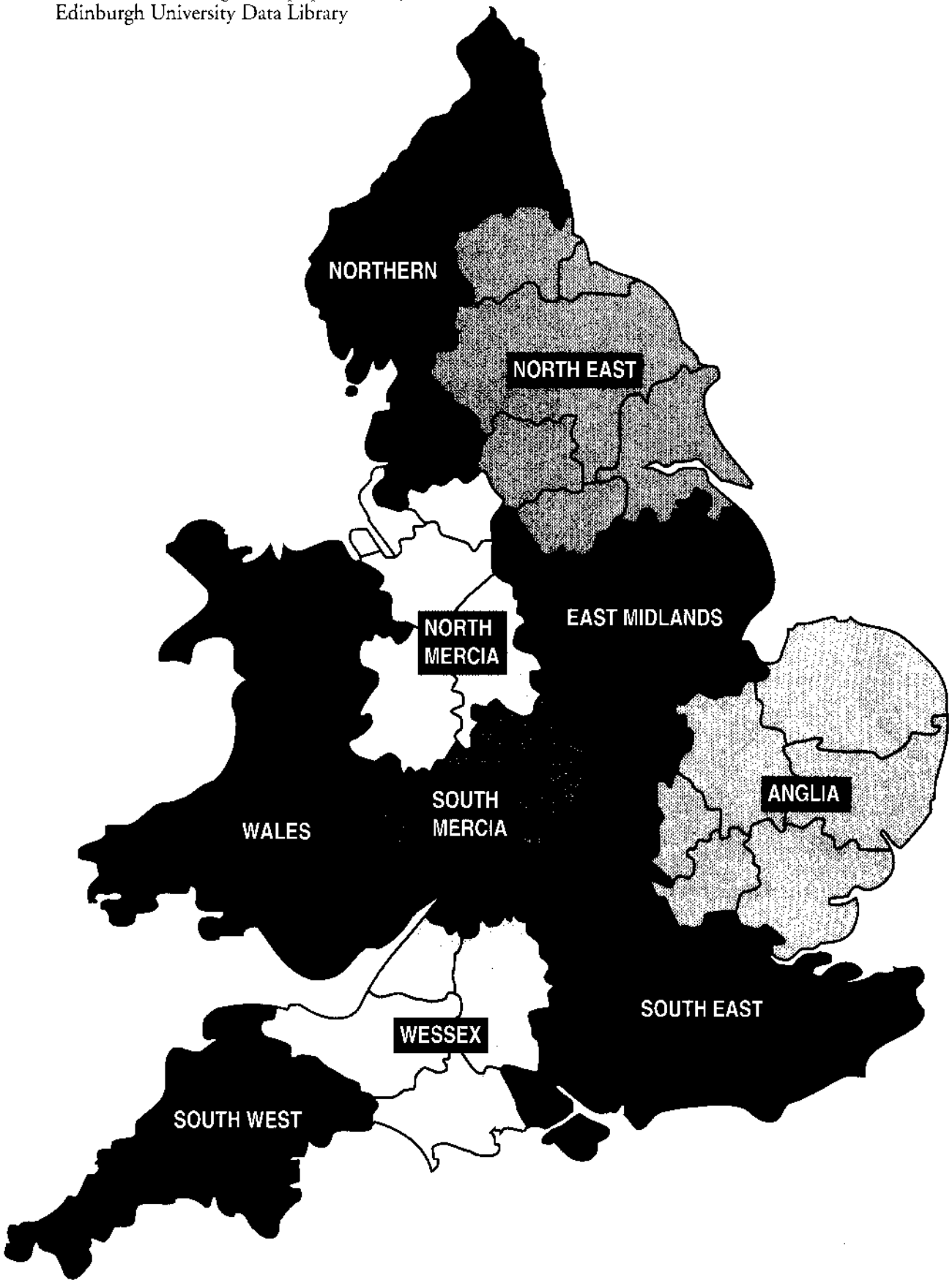
1 Yates, F (1981) Sampling Methods for Censuses and Surveys (4th Edition) London: Charles Griffin

SECTION D

CONTENTS FOR SECTION D

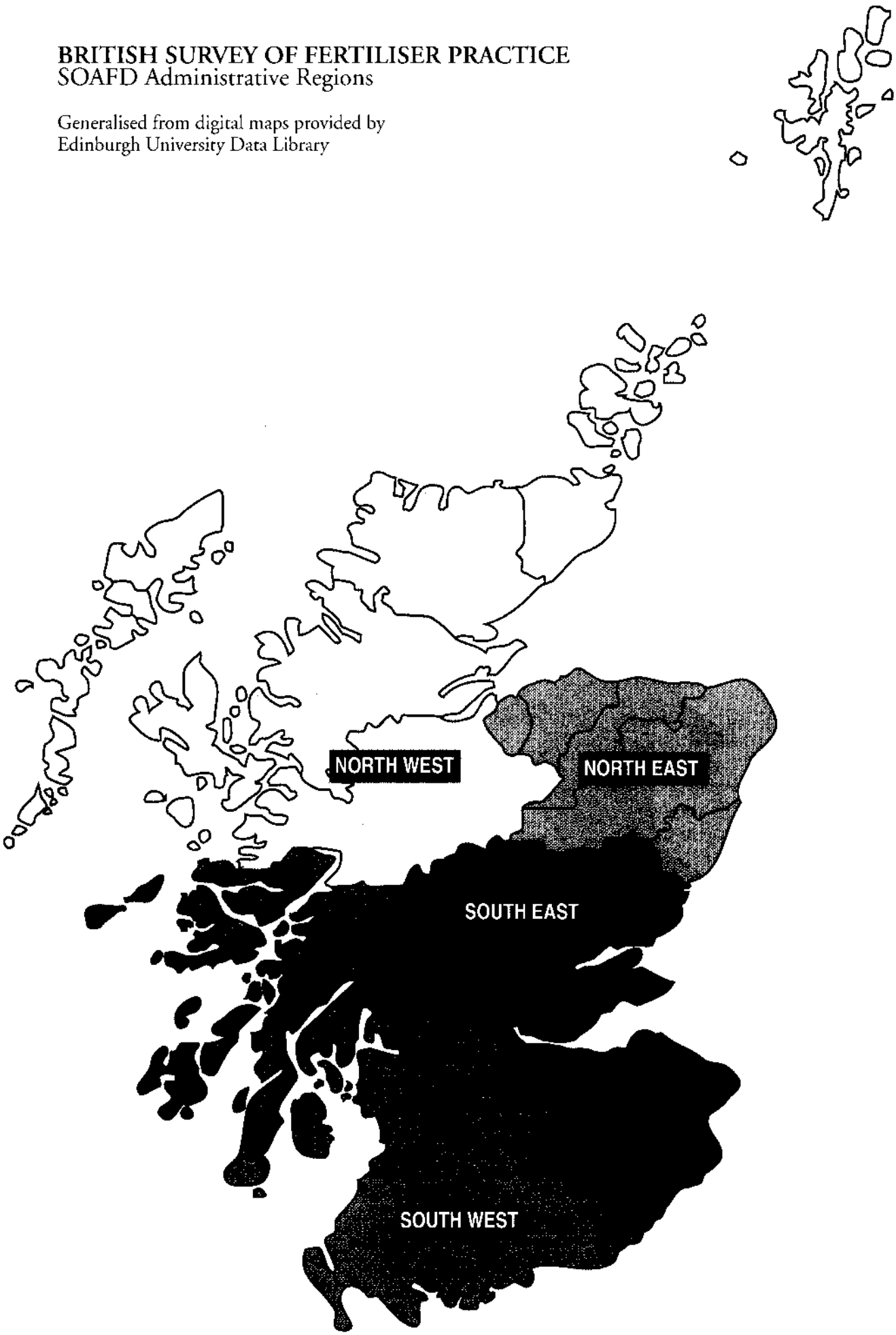
BRITISH SURVEY OF FERTILISER PRACTICE
MAFF Administrative Regions

Generalised from digital maps provided by
Edinburgh University Data Library



BRITISH SURVEY OF FERTILISER PRACTICE
SOAFD Administrative Regions

Generalised from digital maps provided by
Edinburgh University Data Library



CONTENTS

GB TABLES 1993

Table GB1.1 Total fertiliser use in Britain 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	68	99	71	75	10	144	48	54	143	34	40	147
Winter wheat	1737	99	77	69	12	186	68	71	185	52	49	3133
Spring barley	553	98	91	92	29	94	52	60	92	47	55	1090
Winter barley	596	99	83	83	17	138	63	73	137	52	61	1114
Oats	84	95	85	85	21	98	60	66	93	51	56	222
Rye	8	88	67	73	24	134	41	54	117	27	39	24
Early potatoes	24	91	86	86	45	167	183	207	153	158	178	68
Maincrop potatoes	119	97	95	95	43	191	191	268	185	182	256	373
Sugar beet	194	96	78	89	33	115	74	156	110	58	139	469
Oilseed rape	412	99	81	76	11	181	64	66	180	52	50	692
Linseed	151	91	46	45	6	65	47	52	59	22	24	328
Forage maize	83	72	57	45	87	66	56	67	48	32	30	188
Turnips (stock)	27	85	70	70	45	73	102	81	62	71	57	85
Kale and cow cabbage	12	95	85	85	52	112	53	53	106	45	45	39
Other roots/green crops	35	87	82	85	35	112	74	80	98	61	68	115
Peas	141	10	41	48	7	42	66	70	4	27	33	294
Beans	201	8	50	53	5	48	65	76	4	33	40	363
Vegetables (brassicae)	40	98	85	90	15	200	106	185	195	91	166	140
Vegetables (other)	33	85	72	80	10	114	90	136	97	64	109	138
Small fruit	3	73	74	72	3	77	49	80	57	37	58	33
Top fruit	12	56	51	51	4	70	38	58	39	20	29	48
Other tillage	69	55	40	39	16	123	56	82	67	22	31	168
All tillage	4602	90	76	74	18	152	69	82	137	52	60	9271
Grass under 5 years	1156	90	68	69	39	169	42	63	151	28	44	2065
Grass 5 years and over	4273	78	59	59	41	130	32	42	101	19	25	3972
All grass	5429	81	61	61	41	139	34	47	112	21	29	6037
All crops & grass	10031	85	68	67	30	145	52	65	124	35	43	15308

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table GB1.2 Use of 'straight' fertiliser in Britain 1993

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	68	93	1	5	123	100	85	115	1	4	147
Winter wheat	1737	97	8	4	178	87	82	173	7	4	3133
Spring barley	553	56	2	4	72	76	75	40	2	3	1090
Winter barley	596	94	5	6	131	66	95	124	3	5	1114
Oats	84	65	1	6	103	45	78	67	1	4	222
Rye	8	74	•	6	117	•	105	87	•	7	24
Early potatoes	24	27	3	6	94	128	192	26	4	12	68
Maincrop potatoes	119	26	3	8	114	127	261	30	4	22	373
Sugar beet	194	82	2	16	105	68	136	86	2	22	469
Oilseed rape	412	94	4	3	170	85	90	160	3	2	692
Linseed	151	74	5	5	63	79	86	47	4	5	328
Forage maize	83	29	3	3	85	93	107	25	3	4	188
Turnips (stock)	27	22	2	•	64	204	•	14	5	•	85
Kale and cow cabbage	12	44	4	•	100	29	•	44	1	•	39
Other roots/green crops	35	34	5	6	120	73	109	41	4	6	115
Peas	141	2	2	8	127	104	77	2	2	6	294
Beans	201	2	5	9	67	103	149	2	6	14	363
Vegetables (brassicae)	40	74	6	9	147	82	131	109	5	12	140
Vegetables (other)	33	54	12	16	101	109	130	55	13	21	138
Small fruit	3	24	14	12	88	35	111	21	5	13	33
Top fruit	12	40	16	2	57	61	110	23	9	2	48
Other tillage	69	44	3	4	118	62	164	53	2	6	168
All tillage	4602	76	5	5	148	85	107	113	5	6	9271
Grass under 5 years	1156	58	2	3	136	87	109	79	2	3	2065
Grass 5 years and over	4273	41	1	1	122	81	110	50	1	1	3972
All grass	5429	45	1	1	126	83	109	56	1	2	6037
All crops & grass	10031	59	3	3	139	84	107	82	3	3	15308

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table GB1.3 Use of compound fertiliser in Britain 1993

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	68	45	69	70	62	47	51	28	33	36	147
Winter wheat	1737	25	69	66	47	65	69	12	45	45	3133
Spring barley	553	79	90	90	66	50	58	52	45	52	1090
Winter barley	596	28	79	78	46	62	71	13	49	56	1114
Oats	84	50	84	80	52	60	64	26	51	51	222
Rye	8	63	67	67	48	41	49	30	27	32	24
Early potatoes	24	81	85	85	156	181	196	127	154	167	68
Maincrop potatoes	119	91	93	89	172	192	261	158	178	232	373
Sugar beet	194	33	77	78	72	74	151	24	56	117	469
Oilseed rape	412	44	78	74	45	63	65	20	49	48	692
Linseed	151	27	42	40	47	43	47	12	18	19	328
Forage maize	83	50	55	44	46	53	62	23	29	27	188
Turnips (stock)	27	68	70	70	71	95	81	48	66	57	85
Kale and cow cabbage	12	75	85	85	83	51	53	62	44	45	39
Other roots/green crops	35	69	81	82	82	70	75	57	57	62	115
Peas	141	8	40	40	20	61	68	2	25	27	294
Beans	201	6	45	44	39	60	60	2	27	26	363
Vegetables (brassicae)	40	79	79	80	110	108	192	86	86	154	140
Vegetables (other)	33	49	61	66	85	85	133	42	52	88	138
Small fruit	3	59	60	60	60	53	74	36	32	44	33
Top fruit	12	48	48	48	34	21	56	17	10	27	48
Other tillage	69	22	37	36	68	55	70	15	20	25	168
All tillage	4602	37	71	69	64	67	79	24	48	55	9271
Grass under 5 years	1156	65	67	68	111	40	60	72	27	41	2065
Grass 5 years and over	4273	58	59	58	89	31	40	51	18	24	3972
All grass	5429	59	60	61	94	33	45	56	20	27	6037
All crops & grass	10031	49	65	65	84	50	62	41	33	40	15308

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table GB3.1 Product type as percentage of all product used by crop group 1993

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	All crops & grass
Calcium Ammonium Nitrate	0.3	0.3	•	0.1	0.4	0.6	0.3	0.2	•	0.2	•	0.2	0.2
Urea	1.5	8.6	1.5	1.3	9.2	1.7	6.3	3.2	2.7	2.5	•	2.8	4.7
Ammonium Nitrate	25.7	50	4.4	20.2	48.3	23.4	39.9	37.4	28.3	27.8	37.3	32.1	36.4
Other Straight N	2	6.7	0.7	2.2	6	1.5	5	1.5	1	5.4	•	3.3	4.2
Triple Super Phosphate	0.8	1.8	0.8	0.2	1	2.9	1.5	0.5	0.5	0.3	0.8	0.4	1
Single Super Phosphate	•	•	•	0.3	•	•	•	0.2	•	•	•	0.1	0.1
Other Straight P	•	0.1	0.1	0.1	•	0.2	0.1	0.1	0.5	0.1	•	0.1	0.1
Muriate of Potash	1	1	2.2	0.7	0.6	4.6	1.3	0.2	0.5	1	•	0.6	1
Other Straight K	•	•	1	9	•	0.4	0.7	•	•	•	•	•	0.4
NP	0.5	1.1	2.9	0.2	1.1	2	1.2	3.2	0.8	1.7	•	2.3	1.7
NK	0.4	0.8	0.4	1.3	0.1	2.5	0.8	2	3.3	10.9	11.3	6.5	3.4
PK	7.6	18.8	1.7	38.6	12.6	20.1	17.3	1.8	3.3	2.7	14.4	2.4	10.6
Very High N	1.7	1.3	0.2	0.3	0.9	0.9	1.1	24.7	16.6	18	6.8	20.7	9.9
High N	27.9	1.9	1.7	1.3	3.1	8.6	5.2	20.2	32.5	19.5	17.7	20.7	12.2
High P	1.2	0.5	4.6	•	0.2	1.7	0.9	•	0.1	•	•	•	0.5
High K	9.8	1.6	60.7	10.8	3.2	14.9	8.5	0.6	1.5	2.6	2.5	1.6	5.4
Low N	3.6	4.2	9.7	1	7.5	6.1	4.8	0.7	0.5	0.6	•	0.6	2.9
Low P	2.5	0.2	0.6	2.4	0.6	1.9	0.8	1.1	2.1	5.7	2.9	3.4	2
Equal NPK	13.4	0.8	6.5	0.5	5.2	5.1	3.3	1.1	3.1	0.7	6.3	1.1	2.3
Unknown	0.2	0.3	0.4	9.6	•	0.8	1	1.4	2.6	0.4	•	1	1
Total prod ('000 tonnes)	**301**	**1663**	**201**	**205**	**287**	**240**	**2897**	**1022**	**171**	**1149**	**14**	**2357**	**5254**

Source: British Survey of Fertiliser Practice 1993

Table GB3.2 Use of product type by crop group 1993

('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	6.5	34.6	•	1.7	9.9	11.8	64.4	17.1	0.5	18.1	•	35.6	12.4
Urea	1.8	57.1	1.2	1	10.5	1.7	73.4	13.3	1.9	11.4	•	26.6	249.4
Ammonium Nitrate	4	43.6	0.5	2.2	7.3	2.9	60.4	20	2.5	16.7	0.3	39.6	1910.6
Other Straight N	2.8	49.9	0.6	2.1	7.8	1.7	64.7	6.7	0.8	27.8	•	35.3	222.1
Triple Super Phosphate	4.4	55.5	2.9	0.8	5.4	13.5	82.4	9.6	1.6	6.3	0.2	17.6	52.5
Single Super Phosphate	•	12.1	•	18.8	•	0.3	31.2	64.6	•	4.2	•	68.8	3.1
Other Straight P	•	23.1	4	4.7	•	9.2	41	16.7	16.3	26	•	59	5.2
Muriate of Potash	5.8	30.9	8.5	2.9	3.2	21.5	72.8	4.3	1.6	21.3	•	27.2	51.9
Other Straight K	•	0.3	9.2	85.2	•	4.8	99.5	0.3	•	0.3	•	0.5	21.5
NP	1.9	21.4	6.5	0.6	3.5	5.4	39.3	36.9	1.5	22.2	•	60.7	88.1
NK	0.6	7.7	0.5	1.5	0.1	3.3	13.6	11.6	3.2	70.7	0.9	86.4	177.7
PK	4.1	55.9	0.6	14.1	6.5	8.6	89.8	3.2	1	5.5	0.4	10.2	559.3
Very High N	1	4.1	0.1	0.1	0.5	0.4	6.2	48.5	5.4	39.6	0.2	93.8	521.3
High N	13.1	5	0.5	0.4	1.4	3.2	23.7	32.2	8.7	35	0.4	76.3	640.2
High P	14.1	29.9	35.3	•	2.6	15.2	97.1	1.2	0.4	1.4	•	2.9	26.1
High K	10.5	9.4	43.1	7.8	3.2	12.6	86.6	2	0.9	10.3	0.1	13.4	283.2
Low N	6.9	45.8	12.7	1.4	14	9.5	90.4	4.4	0.6	4.6	•	9.6	153.9
Low P	7.1	3.8	1.2	4.8	1.6	4.3	22.8	11	3.5	62.4	0.4	77.2	104.5
Equal NPK	33.5	10.9	10.9	0.9	12.4	10.3	78.8	9.7	4.4	6.3	0.8	•	120.0
Unknown	1.2	10.8	1.4	37.6	•	3.6	54.9	26.9	8.7	9.2	•	•	51.7
Total product	**5.7**	**31.7**	**3.8**	**3.9**	**5.5**	**4.6**	**55.1**	**19.5**	**3.3**	**21.9**	**0.3**	**43.9**	**5254.7**

Source: British Survey of Fertiliser Practice 1993

Table GB3.3 Product use in Britain by month of application - 1993

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product ('000 tonnes)
Calcium Ammonium Nitrate	4	3	29	41	10	6	2	4	•	•	•	3	12
Urea	1	15	36	29	10	5	3	•	•	1	•	•	249
Ammonium Nitrate	•	8	28	35	14	6	5	3	1	•	•	•	1910
Other Straight N	•	11	35	31	9	7	6	1	•	•	•	•	222
Triple Super Phosphate	1	9	12	16	2	2	2	7	26	16	5	1	52
Single Super Phosphate	•	12	48	17	•	4	•	•	•	•	•	19	3
Other Straight P	3	•	15	•	18	18	2	16	•	28	•	•	5
Muriate of Potash	5	22	11	14	8	4	2	2	12	10	8	2	51
Other Straight K	21	25	4	1	•	•	•	•	1	29	9	10	21
NP	3	26	35	18	6	2	2	•	4	2	•	•	88
NK	•	3	9	6	21	44	15	1	•	•	•	•	177
PK	3	14	13	3	2	•	•	3	25	25	8	3	559
Very High N	•	4	23	33	13	11	8	7	1	•	•	•	521
High N	•	5	29	35	16	7	6	2	•	•	•	•	640
High P	•	26	29	12	13	1	•	2	12	3	1	•	26
High K	2	13	38	27	10	1	1	3	2	1	1	•	283
Low N	2	14	24	7	7	1	•	5	15	20	3	•	153
Low P	•	5	23	19	24	19	8	1	•	•	•	•	104
Equal NPK	•	9	32	29	11	4	1	6	2	4	•	•	120
Unknown	3	21	12	8	15	5	1	•	2	12	11	8	51
All fertilisers	1	9	26	27	12	7	5	3	4	4	1	1	5255

Source: British Survey of Fertiliser Practice 1993

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ENGLAND AND WALES TABLES 1993

Table EW1.1 Total fertiliser use in England and Wales 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	65	99	71	74	10	145	49	55	144	35	41	143
Winter wheat	1530	99	74	66	11	185	67	69	184	50	46	2854
Spring barley	242	96	83	84	22	94	44	57	90	36	48	577
Winter barley	533	99	82	81	16	133	61	72	133	50	59	1017
Oats	57	94	79	79	14	105	63	68	99	50	54	166
Rye	8	88	67	73	24	134	41	54	117	27	39	24
Early potatoes	19	92	85	85	42	162	185	202	149	157	171	59
Maincrop potatoes	85	97	95	95	38	203	200	284	197	190	271	305
Sugar beet	194	96	78	89	33	115	74	156	110	58	139	469
Oilseed rape	318	99	78	71	10	181	65	65	179	51	46	564
Linseed	146	90	47	47	6	65	47	52	59	22	24	323
Forage maize	83	72	57	45	87	66	56	67	48	32	30	188
Turnips (stock)	12	68	33	33	22	64	48	55	43	16	18	26
Kale and cow cabbage	5	87	64	64	63	101	46	51	89	29	33	21
Other roots/green crops	22	81	72	77	38	115	71	85	93	51	66	88
Peas	131	8	39	46	8	49	68	72	4	26	33	280
Beans	198	8	50	52	5	49	65	76	4	32	40	358
Vegetables (brassicae)	34	97	83	88	11	200	105	192	195	88	169	132
Vegetables (other)	26	84	67	78	6	110	84	137	92	56	107	123
Small fruit	2	65	66	63	5	98	54	89	63	36	56	29
Top fruit	12	56	51	51	4	70	38	58	39	20	29	48
Other tillage	66	54	39	37	14	123	56	82	67	22	31	161
All tillage	3787	89	72	69	16	155	68	83	137	49	58	7955
Grass under 5 years	850	88	62	64	40	177	43	67	156	26	43	1580
Grass 5 years and over	3403	78	55	56	41	130	31	42	101	17	23	3353
All grass	4253	80	57	58	41	140	33	47	112	19	27	4933
All crops & grass	8041	84	64	63	29	147	52	66	124	33	42	12888

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table EW1.2 Use of 'straight' fertiliser in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	65	95	1	5	123	100	85	117	1	5	143
Winter wheat	1530	97	9	4	178	87	82	173	8	4	2854
Spring barley	242	60	3	5	87	86	95	52	2	4	577
Winter barley	533	94	5	6	128	66	96	121	3	6	1017
Oats	57	78	2	7	108	45	79	84	1	6	166
Rye	8	74	•	6	117	•	105	87	•	7	24
Early potatoes	19	27	4	8	116	128	192	32	5	15	59
Maincrop potatoes	85	34	4	12	108	127	261	36	5	31	305
Sugar beet	194	82	2	16	105	68	136	86	2	22	469
Oilseed rape	318	95	5	3	172	85	96	164	4	2	564
Linseed	146	73	5	5	63	79	86	46	4	5	323
Forage maize	83	29	3	3	85	93	107	25	3	4	188
Turnips (stock)	12	42	•	•	68	•	•	29	•	•	26
Kale and cow cabbage	5	54	•	•	104	•	•	57	•	•	21
Other roots/green crops	22	36	3	7	139	134	118	50	4	8	88
Peas	131	2	3	8	127	104	77	3	3	6	280
Beans	198	2	6	9	67	103	149	2	6	14	358
Vegetables (brassicae)	34	70	1	5	152	25	183	106	•	10	132
Vegetables (other)	26	53	2	8	89	48	123	47	1	10	123
Small fruit	2	32	19	16	88	35	111	28	6	18	29
Top fruit	12	40	16	2	57	61	110	23	9	2	48
Other tillage	66	46	3	4	118	62	164	54	2	7	161
All tillage	3788	78	6	6	151	85	111	118	5	6	7955
Grass under 5 years	850	65	2	3	142	88	113	92	2	4	1580
Grass 5 years and over	3403	44	1	1	126	80	111	55	1	1	3353
All grass	4253	48	1	2	130	83	112	63	1	2	4933
All crops & grass	8041	62	3	4	142	84	111	89	3	4	12888

Source: British Survey of Fertiliser Practice 1993

Table EW1.3 Use of compound fertiliser in England and Wales 1993

	Ha.* ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	65	43	70	69	62	48	52	27	33	36	143
Winter wheat	1530	22	66	62	49	64	68	11	42	42	2854
Spring barley	242	60	81	81	64	42	54	39	34	43	577
Winter barley	533	24	77	76	49	60	70	12	46	53	1017
Oats	57	31	78	72	48	63	66	15	49	48	166
Rye	8	63	67	67	48	41	49	30	27	32	24
Early potatoes	19	78	83	83	149	183	187	117	152	156	59
Maincrop potatoes	85	90	91	86	178	201	276	160	184	238	305
Sugar beet	194	33	77	78	72	74	151	24	56	117	469
Oilseed rape	318	35	73	69	43	64	64	15	47	44	564
Linseed	146	27	43	42	47	43	47	13	19	20	323
Forage maize	83	50	55	44	46	53	62	23	29	27	188
Turnips (stock)	12	30	33	33	49	48	55	15	16	18	26
Kale and cow cabbage	5	51	64	64	62	46	51	32	29	33	21
Other roots/green crops	22	56	72	73	77	66	78	43	47	57	88
Peas	131	6	37	37	21	63	70	1	24	26	280
Beans	198	6	44	43	40	60	60	3	27	26	358
Vegetables (brassicae)	34	81	82	83	109	107	193	88	87	160	132
Vegetables (other)	26	52	67	73	87	83	134	45	56	98	123
Small fruit	2	45	47	47	76	62	82	35	29	39	29
Top fruit	12	48	48	48	34	21	56	17	10	27	48
Other tillage	66	20	35	34	63	55	70	12	20	24	161
All tillage	3788	29	67	64	64	66	80	19	44	51	7955
Grass under 5 years	850	59	61	63	108	40	62	64	25	39	1580
Grass 5 years and over	3403	54	55	55	83	30	40	45	16	22	3353
All grass	4253	55	56	57	89	32	45	49	18	26	4933
All crops & grass	8041	43	61	60	81	50	62	35	30	38	12888

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table EW1.4 Use of lime in England and Wales 1993

	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	65	3.2	0.3	2.2	•	•	5.7	3.4	4.0	2.5	•	•	3.1	143
Winter wheat	1530	3.0	1.8	1.4	0.4	•	6.7	2.4	2.4	2.4	6.1	•	2.6	2854
Spring barley	242	3.8	0.7	2.7	•	0.8	8.0	2.4	3.0	2.9	10.0	1.5	2.5	577
Winter barley	533	3.3	0.9	2.1	0.4	1.3	8.3	2.2	1.7	3.1	5.5	1.8	2.5	1017
Oats	57	0.5	1.0	1.8	•	•	3.3	•	2.7	3.0	•	•	•	166
Rye	8	2.4	•	1.0	•	•	3.4	2.7	•	3.0	•	•	2.8	24
Early potatoes	19	•	•	2.8	•	•	2.8	•	•	2.8	•	•	2.8	59
Maincrop potatoes	85	•	•	1.1	•	•	2.4	•	•	3.0	10.0	•	2.3	305
Sugar beet	194	9.9	2.6	5.8	3.0	•	22.1	2.5	2.0	2.4	5.0	•	2.7	469
Oilseed rape	318	3.1	1.5	2.3	0.2	0.2	7.3	2.8	2.1	2.4	5.0	7.7	2.7	564
Linseed	146	7.2	0.7	0.6	•	0.2	8.7	1.6	2.7	1.6	•	12.6	2.0	323
Forage maize	83	5.7	3.7	2.2	•	1.4	13.0	2.1	3.1	3.0	•	2.7	2.6	188
Turnips (stock)	12	•	•	•	•	•	•	•	•	•	•	•	•	26
Kale and cow cabbage	5	•	3.0	2.7	•	•	5.7	•	1.5	1.6	•	•	1.6	21
Other roots/green crops	22	19.0	0.1	3.0	•	•	22.1	2.1	1.5	3.1	•	•	2.2	88
Peas	131	0.6	0.3	1.6	•	0.2	2.7	3.4	1.3	1.9	•	1.5	2.2	280
Beans	198	2.2	2.7	1.2	0.1	0.5	6.6	2.5	2.1	3.0	12.5	1.5	2.5	358
Vegetables (brassicae)	34	9.0	1.2	2.3	•	13.2	25.6	1.9	2.7	2.2	•	1.5	1.8	132
Vegetables (other)	26	8.9	•	3.7	•	•	12.6	1.5	•	3.0	•	•	2.0	123
Small fruit	2	•	•	•	•	•	•	•	•	•	•	•	•	29
Top fruit	12	•	1.6	•	•	•	1.6	•	2.7	•	•	•	2.7	48
Other tillage	66	5.5	0.1	0.3	•	•	5.9	1.8	1.5	3.0	•	•	1.9	161
All tillage	3788	3.6	1.4	1.9	0.4	0.4	8.0	•	2.3	2.6	5.6	2.2	•	7955
Grass under 5 years	850	5.4	1.4	1.6	•	1.0	9.4	2.5	2.0	2.9	•	2.1	2.5	1580
Grass 5 years & over	3403	2.8	0.5	1.0	•	0.5	5.0	2.3	2.3	2.7	•	•	•	3353
All grass	4253	3.3	0.7	1.1	•	0.6	5.8	2.4	2.2	2.7	•	•	•	4933
All crops & grass	8041	3.5	1.0	1.5	0.2	0.5	6.8	•	2.3	2.7	5.6	•	•	12888

*Estimated area under crop

Source: 1993 British Survey of Fertiliser Practice

Table EW1.5 Percentage of crop area by field application rate – N (England and Wales 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	1	•	2	1	18	13	14	36	17	•	•	•	143
Winter wheat	1	•	1	1	3	3	9	44	34	5	1	•	2854
Spring barley	4	1	6	13	36	21	13	4	1	•	•	•	577
Winter barley	1	1	1	3	13	19	26	33	3	•	1	•	1017
Oats	6	•	8	10	38	10	13	6	6	2	•	•	166
Rye	12	3	•	1	8	8	43	24	•	•	•	•	24
Early potatoes	8	4	2	•	7	5	3	52	8	•	•	•	59
Maincrop potatoes	3	1	•	2	4	2	4	30	41	9	2	1	305
Sugar beet	4	1	6	7	13	17	37	14	•	•	•	•	469
Oilseed rape	1	•	•	2	7	7	16	23	33	10	1	•	564
Linseed	10	3	24	27	31	2	2	1	•	•	•	•	323
Forage maize	28	12	22	14	13	6	2	4	•	•	1	•	188
Turnips (stock)	32	•	14	37	5	9	•	2	•	•	•	•	26
Kale and cow cabbage	13	•	13	10	22	6	29	7	•	•	•	•	21
Other roots/green crops	19	1	12	9	16	10	8	17	6	1	•	•	88
Peas	92	5	•	•	1	•	•	1	•	•	•	•	280
Beans	92	4	1	2	•	•	•	1	•	•	•	•	358
Vegetables (brassicae)	3	1	3	5	17	4	6	5	32	9	9	7	132
Vegetables (other)	17	4	7	8	15	14	14	14	3	•	2	•	123
Small fruit	35	2	17	6	2	16	15	7	•	•	•	•	29
Top fruit	44	•	21	8	15	2	5	4	•	•	•	•	48
Other tillage	46	2	5	14	5	3	6	16	2	1	2	•	161
All tillage	12	1	3	4	10	8	12	28	18	3	1	•	7955
Grass under 5 years	12	•	5	9	10	5	11	13	13	10	9	2	1580
Grass 5 years and over	22	1	11	16	12	6	8	10	6	4	4	1	3353
All grass	20	•	10	14	12	6	9	10	7	5	5	1	4933
All crops & grass	16	1	7	10	11	6	10	18	13	4	3	1	12888

Source : British Survey of Fertiliser Practice 1993

Table EW1.6 Percentage of crop area by field application rate – P_2O_5 (England and Wales 1993)

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	29	15	23	19	14	•	•	•	•	•	•	•	143
Winter wheat	26	2	11	38	18	3	1	1	•	•	•	•	2854
Spring barley	17	13	40	23	6	1	•	1	•	•	•	•	577
Winter barley	19	3	18	41	18	2	•	•	•	•	•	•	1017
Oats	21	3	14	43	12	7	•	•	1	•	•	•	166
Rye	33	7	28	31	•	•	•	•	•	•	•	•	24
Early potatoes	15	2	2	5	5	1	1	20	45	•	3	•	59
Maincrop potatoes	6	2	1	4	3	4	1	32	27	12	7	•	305
Sugar beet	22	4	24	25	9	6	3	5	1	•	1	•	469
Oilseed rape	22	4	14	37	19	3	1	•	1	•	•	•	564
Linseed	53	6	22	16	2	1	•	1	•	•	•	•	323
Forage maize	43	3	27	15	10	1	2	2	•	•	•	•	188
Turnips (stock)	67	12	11	5	1	3	•	2	•	•	•	•	26
Kale and cow cabbage	36	15	26	14	7	2	•	•	•	•	•	•	21
Other roots/green crops	28	3	25	9	19	6	7	3	•	•	•	•	88
Peas	61	•	6	21	8	2	•	1	•	•	•	•	280
Beans	50	•	9	27	8	5	•	•	•	•	•	•	358
Vegetables (brassicae)	17	2	12	13	11	12	6	26	•	•	•	•	132
Vegetables (other)	35	8	12	3	20	4	6	9	3	•	•	•	123
Small fruit	34	6	33	5	7	15	•	•	•	•	•	•	29
Top fruit	49	32	3	14	1	1	1	•	•	•	•	•	48
Other tillage	61	2	21	8	3	•	3	•	•	•	•	•	161
All tillage	28	4	15	31	14	3	1	2	1	•	•	•	7955
Grass under 5 years	38	15	24	16	4	1	•	1	•	•	•	•	1580
Grass 5 years and over	45	23	23	7	1	1	•	•	•	•	•	•	3353
All grass	43	22	23	9	2	1	•	•	•	•	•	•	4933
All crops & grass	36	13	20	19	8	2	1	1	1	•	•	•	12888

Source : British Survey of Fertiliser Practice 1993

Table EW1.7 Percentage of crop area by field application rate – K_2O (England and Wales 1993)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat		26	•	37	15	19	3	•	•	•	•	•	•	143
Winter wheat		34	2	11	26	20	5	1	1	•	•	•	•	2854
Spring barley		16	5	32	23	17	5	1	1	•	•	•	•	577
Winter barley		19	2	11	33	26	7	1	1	•	•	•	•	1017
Oats		21	1	14	28	31	2	1	1	•	•	•	•	166
Rye		27	•	23	42	4	4	•	•	•	•	•	•	24
Early potatoes		15	•	3	2	8	•	1	39	•	9	18	•	59
Maincrop potatoes		5	1	1	2	•	4	•	3	13	26	42	3	305
Sugar beet		11	1	1	6	15	11	10	22	15	4	2	2	469
Oilseed rape		29	3	14	29	18	3	1	•	1	•	•	•	564
Linseed		53	6	17	17	4	1	•	1	•	•	•	•	323
Forage maize		54	4	15	13	4	3	2	4	•	•	•	•	188
Turnips (stock)		67	12	7	2	5	5	•	2	•	•	•	•	26
Kale and cow cabbage		36	15	20	20	•	6	3	•	•	•	•	•	21
Other roots/green crops		23	1	16	11	19	18	5	4	1	•	•	•	88
Peas		54	1	5	21	14	2	2	1	•	•	•	•	280
Beans		48	3	8	23	10	4	•	•	4	•	•	•	358
Vegetables (brassicae)		12	2	3	3	4	9	5	14	21	10	16	•	132
Vegetables (other)		23	6	2	5	8	10	12	27	4	•	3	•	123
Small fruit		37	•	•	10	23	30	•	•	•	•	•	•	29
Top fruit		49	•	14	31	3	1	•	1	•	•	•	•	48
Other tillage		63	2	18	4	4	•	1	6	1	•	•	•	161
All tillage		31	2	12	23	18	5	2	3	2	1	1	•	7955
Grass under 5 years		36	11	18	14	8	5	3	5	1	•	•	•	1580
Grass 5 years and over		44	18	21	9	4	1	1	1	•	•	•	•	3353
All grass		42	17	20	10	5	2	1	1	•	•	•	•	4933
All crops & grass		37	10	17	16	11	4	2	2	1	•	1	•	12888

Source : British Survey of Fertiliser Practice 1993

Table EW2.1 Average fertiliser practice by grassland utilisation in England and Wales 1993

	Ha. * ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed – not mown	2436	71	50	48	28	122	27	30	87	14	14	2339
Grazed – mown	1643	91	65	70	59	159	38	62	145	25	44	2293
All grazings	4080	79	56	57	41	139	32	46	110	18	26	4632
Cut for seed grazed	1	100	91	91	•	176	101	60	176	92	55	4
Cut for seed not grazed	7	100	79	79	•	112	69	66	112	55	52	9
All cut for seed	9	100	81	81	•	122	75	65	122	61	53	13
Cut for silage grazed	1152	95	71	77	63	177	39	69	169	28	53	1562
Cut for silage not grazed	81	93	63	71	42	192	57	84	180	36	59	154
All cut for silage	1234	95	70	76	62	178	40	70	170	28	54	1716
Cut for hay grazed	485	81	53	54	50	109	33	40	89	17	22	721
Cut for hay not grazed	38	80	67	69	27	119	41	44	95	27	31	66
All cut for hay	523	81	54	55	48	110	34	41	89	18	22	787
All mowings	1766	91	65	70	57	160	39	63	146	25	44	2516
All grass	4253	79	56	57	40	139	33	47	111	18	27	4934

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table EW2.2 Percentage of grass area by field application rate – N (England and Wales 1993)

row %	kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown		28	1	13	17	10	5	6	8	4	3	3	2	2339
Grazed – mown		9	•	5	10	13	7	13	14	12	8	8	1	2293
All grazings		20	•	10	14	11	6	9	10	7	5	5	1	4632
Cut for seed grazed		•	•	•	•	•	•	•	79	21	•	•	•	4
Cut for seed not grazed		•	•	•	•	64	•	6	30	•	•	•	•	9
All cut for seed		•	•	•	•	54	•	5	38	3	•	•	•	13
Cut for silage grazed		4	•	3	7	11	7	13	17	15	11	10	1	1562
Cut for silage not grazed		6	•	1	10	11	2	8	15	27	8	9	3	154
All cut for silage		4	•	3	7	11	7	13	17	16	10	10	1	1716
Cut for hay grazed		19	1	10	18	18	7	14	6	4	2	3	•	721
Cut for hay not grazed		20	•	13	18	20	4	4	4	6	3	9	•	66
All cut for hay		19	•	10	18	18	7	13	6	4	2	3	•	787
All mowings		9	•	5	10	13	7	13	14	12	8	8	1	2516
All grass		20	•	10	14	12	6	9	10	7	5	5	1	4934

Source : British Survey of Fertiliser Practice 1993

Table EW2.3 Percentage of grass area by field application rate – P_2O_5 (England and Wales 1993)

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	50	25	19	5	1	•	•	•	•	•	•	•	2339
Grazed – mown	34	18	30	14	2	1	1	•	•	•	•	•	2293
All grazings	43	22	23	8	2	1	•	•	•	•	•	•	4632
Cut for seed grazed	9	•	•	53	•	•	•	38	•	•	•	•	4
Cut for seed not grazed	21	•	•	19	61	•	•	•	•	•	•	•	9
All cut for seed	19	•	•	24	51	•	•	6	•	•	•	•	13
Cut for silage grazed	29	17	32	17	3	1	1	•	•	•	•	•	1562
Cut for silage not grazed	36	10	21	14	12	4	•	2	1	•	•	•	154
All cut for silage	29	17	31	17	3	1	1	•	•	•	•	•	1716
Cut for hay grazed	47	19	24	7	2	2	•	•	•	•	•	•	721
Cut for hay not grazed	32	14	35	7	12	•	•	1	•	•	•	•	66
All cut for hay	46	18	25	7	2	2	•	•	•	•	•	•	787
All mowings	34	17	29	14	3	1	1	•	•	•	•	•	2516
All grass	43	22	23	9	2	1	•	•	•	•	•	•	4934

Source : British Survey of Fertiliser Practice 1993

Table EW2.4 Percentage of grass area by field application rate – K_2O (England and Wales 1993)

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	51	22	19	6	2	•	•	•	•	•	•	•	2339
Grazed – mown	29	10	22	17	9	5	3	3	1	•	1	•	2293
All grazings	42	17	20	10	5	2	1	1	•	•	•	•	4632
Cut for seed grazed	9	•	38	12	41	•	•	•	•	•	•	•	4
Cut for seed not grazed	21	•	15	3	61	•	•	•	•	•	•	•	9
All cut for seed	19	•	19	5	57	•	•	•	•	•	•	•	13
Cut for silage grazed	23	9	21	20	11	6	4	4	1	•	1	•	1562
Cut for silage not grazed	29	9	12	14	15	3	6	11	1	1	•	•	154
All cut for silage	23	9	20	20	11	6	4	5	1	•	1	•	1716
Cut for hay grazed	45	13	25	8	5	2	•	•	•	•	•	•	721
Cut for hay not grazed	30	13	32	11	9	4	•	•	•	•	•	•	66
All cut for hay	44	13	26	9	6	2	•	•	•	•	•	•	787
All mowings	29	10	22	16	10	5	3	3	1	•	•	•	2516
All grass	42	17	20	10	5	2	1	1	•	•	•	•	4934

Source : British Survey of Fertiliser Practice 1993

Table EW3.1 Product type as percentage of all product used by crop group in England and Wales 1993

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	All crops & grass
Calcium Ammonium Nitrate	0.6	0.3	•	0.1	0.6	0.7	0.3	0.2	•	0.3	•	0.2	0.3
Urea	3.2	9.6	2	1.3	11.9	2.1	7.6	3.8	3.6	3.1	•	3.4	5.8
Ammonium Nitrate	33.7	49	5.5	20.2	47.8	24.8	40.5	41.2	31.9	31.7	42.7	35.8	38.5
Other Straight N	3.5	7.5	0.7	2.2	6.9	1.8	5.8	1.9	1.2	6.7	•	4.2	5.1
Triple Super Phosphate	0.9	2	1	0.2	1.3	2.8	1.7	0.6	0.4	0.3	0.9	0.4	1.2
Single Super Phosphate	•	•	•	0.3	•	•	•	0.1	•	•	•	•	0
Other Straight P	•	•	0.1	0.1	•	•	•	•	0.2	0.1	•	0.1	0.1
Muriate of Potash	1.6	1	2.8	0.7	0.6	5	1.4	0.3	0.5	1.2	•	0.7	1.1
Other Straight K	•	•	1.3	9	•	0.5	0.9	•	•	•	•	•	0.5
NP	1	1.3	3.7	0.2	1.5	2.2	1.4	2.5	1	1.7	•	2	1.7
NK	0.4	0.8	0.5	1.3	0.1	2.9	0.9	2.5	4.3	12	1.3	7.3	3.7
PK	12.6	19	2.2	38.6	14.5	22.7	19.1	2.1	3.3	3.1	16.5	2.8	12
Very High N	2.4	1.5	0.3	0.3	1.1	0.7	1.2	20.9	13	15.2	7.8	17.4	8.3
High N	24.3	1.8	2.1	1.3	2.8	7.2	3.7	19.2	32	15.3	20.3	18.2	10
High P	0.2	0.3	4.6	•	0.3	0.2	0.6	•	0.1	•	•	•	0.3
High K	7.6	1.8	54.7	10.8	2.4	14.8	7.6	0.6	1.7	3.1	•	1.9	5.1
Low N	1.6	3	12.3	1	5.9	4.4	3.8	0.3	0.3	0.7	•	0.5	2.3
Low P	3.4	0.2	0.8	2.4	0.1	2.1	0.8	1.4	1.7	4.7	3.3	3	1.7
Equal NPK	2.8	0.4	5.2	0.5	2.3	4.4	1.4	0.8	3.4	0.5	7.2	0.9	1.2
Unknown	0.2	0.3	0.5	9.6	•	0.8	1.2	1.7	1.1	0.4	•	1	1.1
Total prod ('000 tonnes)	**143**	**1441**	**157**	**205**	**213**	**203**	**2362**	**777**	**130**	**896**	**13**	**1815**	**4177**

Source: British Survey of Fertiliser Practice 1993

Table EW3.2 Use of product type by crop group in England and Wales 1993

('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	6.8	33.7	•	1.8	10.4	12	64.7	15.9	0.5	19	•	35.3	11.8
Urea	1.9	57.7	1.3	1.1	10.5	1.7	74.2	12.2	2	11.7	•	25.8	240.5
Ammonium Nitrate	3	44	0.5	2.6	6.3	3.1	59.5	19.9	2.6	17.6	0.3	40.5	1607.1
Other Straight N	2.4	50.7	0.5	2.1	6.9	1.7	64.3	6.9	0.8	28	•	35.7	213.0
Triple Super Phosphate	2.7	59	3.1	0.8	5.9	11.8	83.4	9.5	1.1	5.9	0.2	16.6	48.1
Single Super Phosphate	•	23.9	•	37.2	•	0.5	61.7	30	•	8.3	•	38.3	1.6
Other Straight P	•	27.8	6.5	10.3	•	•	44.6	15.1	8.9	31.4	•	55.4	2.4
Muriate of Potash	4.7	30.9	9.4	3.2	2.7	21.2	72.1	4.5	1.5	21.9	•	27.9	47.5
Other Straight K	•	0.3	9.2	85.2	•	4.8	99.5	0.3	•	0.3	•	0.5	21.5
NP	2.1	26.7	8.2	0.7	4.5	6.4	48.6	27.6	1.9	21.9	•	51.4	69.9
NK	0.3	7.4	0.6	1.7	0.1	3.8	13.9	12.5	3.6	69.9	0.1	86.1	154.1
PK	3.6	54.6	0.7	15.7	6.2	9.2	90	3.2	0.9	5.5	0.4	10	501.2
Very High N	1	6.2	0.1	0.2	0.7	0.4	8.5	46.9	4.9	39.3	0.3	91.5	345.4
High N	8.3	6.3	0.8	0.6	1.4	3.5	21	35.7	10	32.7	0.6	79	418.1
High P	2.3	34.5	50.8	•	4.8	2.2	94.6	2.2	0.7	2.6	•	5.4	14.1
High K	5.1	12.2	40	10.3	2.4	13.9	83.8	2.2	1	12.9	•	16.1	214.7
Low N	2.3	44.3	19.7	2.2	12.7	9.2	90.3	2.5	0.3	6.8	•	9.7	98.1
Low P	6.6	3.3	1.7	6.8	0.2	6	24.4	14.5	3.1	57.4	0.6	75.6	73.0
Equal NPK	8	12.6	16.5	2.1	10.2	18	67.3	12.6	9	9.2	1.8	32.7	49.1
Unknown	0.7	11	1.6	43	•	3.4	59.7	29.4	3.3	7.6	•	40.3	45.5
Total product	**3.4**	**34.5**	**3.8**	**4.9**	**5.1**	**4.8**	**56.5**	**18.6**	**3.1**	**21.4**	**0.3**	**43.5**	**4176.7**

Source: British Survey of Fertiliser Practice 1993

Table EW3.3 Product use in England and Wales by month of application – 1993

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total product ('000 tonnes)
Calcium Ammonium Nitrate	4	3	28	43	8	6	2	4	•	•	•	3	11
Urea	1	15	36	28	10	5	3	•	•	1	•	•	240
Ammonium Nitrate	•	8	28	35	14	6	5	3	1	•	•	•	1607
Other Straight N	•	10	35	31	9	7	7	1	•	•	•	•	213
Triple Super Phosphate	1	9	11	15	2	1	2	8	29	17	4	1	48
Single Super Phosphate	•	24	13	18	•	8	•	•	•	•	•	37	1
Other Straight P	7	•	•	•	28	•	4	•	•	62	•	•	2
Muriate of Potash	5	22	10	13	9	3	3	2	13	11	7	2	47
Other Straight K	21	25	4	1	•	•	•	•	1	29	9	10	21
NP	4	31	32	12	7	2	3	•	5	3	•	•	69
NK	•	3	10	6	24	42	14	1	•	•	•	•	154
PK	4	14	13	3	2	•	•	3	25	25	8	2	501
Very High N	•	6	26	31	12	8	8	6	2	•	•	•	345
High N	•	6	32	33	14	5	6	2	1	•	•	•	418
High P	1	48	37	1	1	1	•	4	1	3	3	•	14
High K	3	14	43	21	7	1	2	3	3	2	2	•	214
Low N	3	16	30	9	4	1	•	4	12	19	1	1	98
Low P	•	5	30	23	13	19	8	1	•	•	1	•	73
Equal NPK	•	17	28	22	17	4	2	6	2	2	•	•	49
Unknown	4	22	14	9	6	5	1	1	2	13	12	9	45
All fertilisers	1	10	27	26	11	6	4	3	4	4	1	1	4177

Source: British Survey of Fertiliser Practice 1993

Table EW4.1 Average fertiliser practice on tillage and grassland by MAFF Region 1993

		Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
			N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Wessex	All tillage	242	87	73	71	31	155	64	76	135	47	54	548
	All grass	468	76	43	42	42	156	35	51	119	15	22	543
	All crops & grass	710	80	54	52	39	156	49	63	125	26	33	1091
Anglia	All tillage	1035	88	66	60	9	155	70	93	137	47	56	2189
	All grass	138	64	34	37	10	147	45	48	93	15	18	248
	All crops & grass	1173	85	63	57	9	154	69	90	132	43	51	2437
Northern	All tillage	120	94	87	90	30	147	66	77	139	57	69	289
	All grass	610	83	69	71	53	135	31	41	112	21	29	513
	All crops & grass	730	85	72	74	49	138	38	49	117	27	36	802
North East	All tillage	344	94	77	80	20	164	72	91	154	55	73	701
	All grass	332	84	69	67	39	145	39	48	122	27	32	393
	All crops & grass	676	89	73	74	29	155	57	71	138	41	53	1094
North Mercia	All tillage	175	92	81	83	33	139	60	91	127	49	75	361
	All grass	335	84	54	64	59	172	37	55	145	20	36	382
	All crops & grass	510	87	64	71	50	160	47	70	139	30	49	743
South Mercia	All tillage	319	86	69	65	16	147	62	71	126	43	46	663
	All grass	288	82	40	39	26	145	35	50	118	14	19	411
	All crops & grass	607	84	55	53	21	146	53	63	122	29	33	1074
East Midlands	All tillage	674	89	73	63	12	161	71	80	143	52	51	1258
	All grass	257	71	33	35	32	153	35	48	108	11	17	282
	All crops & grass	930	84	62	56	17	159	65	75	133	41	41	1540
South East	All tillage	509	86	72	75	11	155	64	70	133	46	53	1035
	All grass	362	69	38	37	18	173	46	80	120	17	30	516
	All crops & grass	872	79	58	59	14	161	59	73	128	34	43	1551
South West	All tillage	123	87	75	80	36	124	82	93	109	62	75	292
	All grass	498	89	68	71	47	138	33	50	123	23	36	698
	All crops & grass	622	89	70	73	45	135	44	60	120	30	43	990
Wales	All tillage	246	87	73	75	17	160	69	86	140	51	64	620
	All grass	966	80	68	67	43	107	28	38	86	19	26	947
	All crops & grass	1212	81	69	69	38	119	37	49	97	26	34	1567

Source: British Survey of Fertiliser Practice 1993

Table EW5.1 Average fertiliser practice on dairy farms in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	•	7
Winter wheat	77	100	83	83	40	161	56	63	161	46	52	167
Spring barley	30	96	91	91	71	87	40	48	84	36	44	61
Winter barley	55	99	80	81	50	122	60	73	120	48	59	98
Oats	3	•	•	•	•	•	•	•	•	•	•	9
Rye	1	•	•	•	•	•	•	•	•	•	•	3
Early potatoes	2	•	•	•	•	•	•	•	•	•	•	5
Maincrop potatoes	5	86	87	87	77	196	210	285	168	183	249	13
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	6	85	96	96	56	154	62	62	131	60	60	10
Linseed	8	88	81	81	12	35	16	23	31	13	18	13
Forage maize	50	79	60	47	95	55	50	68	44	30	32	99
Turnips (stock)	2	•	•	•	•	•	•	•	•	•	•	5
Kale and cow cabbage	2	•	•	•	•	•	•	•	•	•	•	7
Other roots/green crops	6	73	55	58	46	93	62	71	68	34	41	18
Peas	2	•	•	•	•	•	•	•	•	•	•	9
Beans	2	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	1
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	12	22	16	12	28	53	37	81	12	6	10	12
All tillage	268	88	74	72	56	117	57	68	102	42	49	542
Grass under 5 years	316	95	72	79	55	219	42	79	208	31	63	516
Grass 5 years and over	1013	92	61	67	64	177	35	54	163	21	36	1002
All grass	1329	92	64	70	62	188	37	61	174	24	42	1518
All crops & grass	1597	92	65	70	61	176	41	62	162	27	44	2060

Source: British Survey of Fertiliser Practice 1993

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

Table EW5.2 Average fertiliser practice on cattle & sheep farms in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	*	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	21	97	91	88	53	159	55	65	154	50	57	50
Spring barley	21	98	95	95	45	85	39	44	84	37	42	67
Winter barley	25	100	100	98	48	125	63	74	125	63	73	69
Oats	8	88	85	85	29	76	63	72	67	54	61	27
Rye	1	•	•	•	•	•	•	•	•	•	•	2
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	1	•	•	•	•	•	•	•	•	•	•	6
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	2	•	•	•	•	•	•	•	•	•	•	7
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	4	95	95	71	95	128	68	61	121	65	44	10
Turnips (stock)	1	•	•	•	•	•	•	•	•	•	•	5
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	2
Other roots/green crops	5	93	100	97	46	65	69	69	60	69	67	22
Peas	0	•	•	•	•	•	•	•	•	•	•	2
Beans	1	•	•	•	•	•	•	•	•	•	•	2
Vegetables (brassicae)	1	•	•	•	•	•	•	•	•	•	•	7
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	4
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	1
Other tillage	8	86	50	50	20	78	89	61	68	44	30	14
All tillage	101	94	89	87	45	115	59	66	108	53	58	301
Grass under 5 years	166	86	68	63	45	120	36	47	104	24	29	336
Grass 5 years and over	1380	74	63	60	40	97	28	33	71	18	19	1173
All grass	1546	75	63	60	40	100	29	34	75	18	21	1509
All crops & grass	1647	76	65	62	41	101	32	37	77	21	23	1810

Source: British Survey of Fertiliser Practice 1993

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

Table EW5.3 Average fertiliser practice on other livestock/mixed farms in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	4	•	•	•	•	•	•	•	•	•	•	5
Winter wheat	52	99	68	57	28	168	96	79	166	65	46	83
Spring barley	6	90	90	87	17	100	46	48	91	42	42	15
Winter barley	26	100	75	79	16	157	63	86	157	47	68	56
Oats	5	100	100	100	•	139	63	75	139	63	75	18
Rye	0	•	•	•	•	•	•	•	•	•	•	2
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	3
Maincrop potatoes	1	•	•	•	•	•	•	•	•	•	•	5
Sugar beet	4	•	•	•	•	•	•	•	•	•	•	6
Oilseed rape	8	100	61	56	14	182	65	74	182	40	41	16
Linseed	5	•	•	•	•	•	•	•	•	•	•	8
Forage maize	3	90	83	85	82	74	54	72	66	44	61	13
Turnips (stock)	0	•	•	•	•	•	•	•	•	•	•	0
Kale and cow cabbage	0	•	•	•	•	•	•	•	•	•	•	0
Other roots/green crops	1	•	•	•	•	•	•	•	•	•	•	4
Peas	9	11	28	59	29	13	56	70	1	16	42	19
Beans	5	40	53	100	1	21	71	75	8	38	75	10
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	3
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	2
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	7
Other tillage	0	•	•	•	•	•	•	•	•	•	•	2
All tillage	129	90	70	70	25	149	76	81	134	53	57	277
Grass under 5 years	50	89	65	60	34	113	34	40	100	22	24	80
Grass 5 years and over	103	63	34	34	20	85	25	32	54	8	11	137
All grass	153	71	44	42	24	96	29	36	69	13	15	217
All crops & grass	281	80	56	55	25	123	56	62	99	31	34	494

Source: British Survey of Fertiliser Practice 1993

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

Table EW5.4 Average fertiliser practice on cropping/horticultural farms in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	52	99	76	80	11	142	48	54	142	36	43	125
Winter wheat	1256	99	73	64	8	190	66	70	188	48	45	2484
Spring barley	153	95	78	80	9	96	47	60	91	37	48	402
Winter barley	377	99	82	82	9	136	61	72	135	50	59	759
Oats	33	93	79	69	13	116	68	72	109	54	50	104
Rye	6	100	72	81	4	136	39	55	136	28	44	17
Early potatoes	16	94	86	86	33	162	183	203	152	158	175	50
Maincrop potatoes	78	98	95	96	35	203	199	285	199	190	273	280
Sugar beet	183	95	79	90	33	115	75	156	109	60	140	458
Oilseed rape	270	99	82	74	9	185	65	64	183	53	48	514
Linseed	116	89	44	45	6	68	51	55	61	23	25	292
Forage maize	16	80	57	56	66	87	63	64	69	36	36	58
Turnips (stock)	8	76	24	24	4	66	36	40	50	9	10	15
Kale and cow cabbage	1	97	81	81	13	113	55	58	110	45	47	11
Other roots/green crops	8	88	57	71	31	154	61	94	136	34	67	41
Peas	116	8	37	42	5	53	69	71	4	25	30	248
Beans	167	8	49	48	6	54	62	62	5	30	30	330
Vegetables (brassicae)	33	97	85	90	11	202	105	192	196	90	173	121
Vegetables (other)	26	83	67	79	6	109	84	138	91	57	109	117
Small fruit	2	65	66	63	5	98	54	89	63	36	56	29
Top fruit	11	58	55	54	4	67	38	58	39	21	31	39
Other tillage	42	60	44	43	10	144	52	89	86	23	39	129
All tillage	2970	89	72	69	11	161	70	86	143	50	59	6623
Grass under 5 years	208	83	52	54	15	200	54	77	166	28	42	556
Grass 5 years and over	391	78	38	37	10	137	38	45	107	14	17	779
All grass	599	80	42	43	12	160	45	59	127	19	25	1335
All crops & grass	3569	87	67	64	11	161	67	83	140	45	53	7958

Source: British Survey of Fertiliser Practice 1993

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

Table EW5.5 Average fertiliser practice on part-time+ farms in England and Wales 1993

	Ha. ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	5	•	•	•	•	•	•	•	•	•	•	2
Winter wheat	123	100	84	73	15	168	72	69	168	60	50	70
Spring barley	31	96	89	89	20	100	39	58	96	35	52	32
Winter barley	49	100	73	69	21	117	64	59	117	47	41	35
Oats	8	•	•	•	•	•	•	•	•	•	•	8
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	1
Maincrop potatoes	0	•	•	•	•	•	•	•	•	•	•	1
Sugar beet	8	•	•	•	•	•	•	•	•	•	•	5
Oilseed rape	32	100	44	44	7	153	71	78	153	31	34	17
Linseed	17	95	42	38	•	56	44	50	53	19	19	10
Forage maize	12	•	•	•	•	•	•	•	•	•	•	9
Turnips (stock)	1	•	•	•	•	•	•	•	•	•	•	1
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	1
Other roots/green crops	2	•	•	•	•	•	•	•	•	•	•	3
Peas	4	•	•	•	•	•	•	•	•	•	•	2
Beans	23	•	56	72	•	•	84	148	•	47	107	11
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	1
Other tillage	3	•	•	•	•	•	•	•	•	•	•	4
All tillage	320	87	70	66	15	138	66	76	120	46	50	213
Grass under 5 years	113	80	43	45	38	112	38	42	89	16	19	95
Grass 5 years and over	538	65	45	46	29	100	27	38	65	12	18	275
All grass	651	68	44	46	31	102	29	39	69	13	18	370
All crops & grass	971	74	53	53	26	116	45	54	86	24	28	583

+Part-time is defined as less than 250 Standard Man Days input per annum

Source: British Survey of Fertiliser Practice 1993

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

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SCOTLAND TABLES 1993

Table SC1.1 Total fertiliser use in Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	207	99	93	93	16	194	73	77	193	68	72	279
Spring barley	312	100	98	98	35	94	57	62	94	55	61	513
Winter barley	63	98	97	97	23	176	76	81	172	74	79	97
Oats	27	97	96	96	35	83	55	62	81	53	59	56
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	6	91	91	91	54	182	175	222	166	160	203	9
Maincrop potatoes	35	95	95	95	53	163	171	229	155	163	218	68
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	94	100	91	91	16	182	60	68	182	55	63	128
Linseed	4	•	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	16	97	97	97	62	78	115	88	76	113	86	59
Kale and cow cabbage	7	100	100	100	44	119	56	54	119	56	54	18
Other roots/green crops	13	99	99	99	31	109	79	74	107	77	73	27
Peas	11	30	72	72	6	18	49	57	5	36	41	14
Beans	3	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	6	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	6	91	89	89	24	129	109	131	117	97	116	15
Small fruit	1	•	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	3	•	•	•	•	•	•	•	•	•	•	7
All tillage **	+643	97	94	94	28	134	70	77	130	65	72	1316
Grass under 5 years	306	94	84	84	35	148	40	55	139	34	46	485
Grass 5 years and over	870	81	74	70	41	129	35	42	105	26	29	619
All grass	+1086	84	77	74	40	135	37	46	114	28	34	1104
All crops & grass **	+1729	89	82	81	36	134	49	58	119	41	47	2420

** Estimates on this row were 'post-stratified' using figures from the 1993 Agricultural Census for Scotland

* Estimated area under crop

+ Obtained directly from 1993 Agricultural Census

Source: British Survey of Fertiliser Practice 1993

Table SC1.2 Use of 'straight' fertiliser in Scotland 1993

	Ha. ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	4
Winter wheat	207	97	3	4	178	84	82	174	3	4	279
Spring barley	312	52	2	3	60	68	51	32	1	1	513
Winter barley	63	95	1	2	158	58	75	150	•	2	97
Oats	27	40	•	2	79	•	68	32	•	1	56
Rye	0	•	•	•	•	•	•	•	•	•	0
Early potatoes	6	28	•	•	23	•	•	6	•	•	9
Maincrop potatoes	35	6	•	•	61	150	•	4	•	•	68
Sugar beet	0	•	•	•	•	•	•	•	•	•	0
Oilseed rape	94	88	•	3	164	•	75	145	•	2	128
Linseed	4	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	16	6	4	•	43	204	•	3	9	•	59
Kale and cow cabbage	7	36	8	•	96	29	•	35	2	•	18
Other roots/green crops	13	31	10	4	83	41	75	26	4	3	27
Peas	11	•	•	•	•	•	•	•	•	•	14
Beans	3	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	6	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	6	60	52	52	146	119	134	88	61	69	15
Small fruit	1	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	0
Other tillage	3	•	•	•	•	•	•	•	•	•	7
All tillage **	+643	64	3	3	126	84	76	80	2	2	1316
Grass under five years	306	41	1	1	106	80	84	44	1	1	485
Grass five years and over	870	29	2	•	101	82	•	29	2	•	619
All grass	+1086	32	2	1	103	82	83	33	1	•	1104
All crops & grass **	+1729	43	2	1	114	83	77	49	2	1	2420

** Estimates on this row were 'post-stratified' using figures from the 1993 Agricultural Census for Scotland

+ Obtained directly from 1993 Agricultural Census

Source: British Survey of Fertiliser Practice 1993

Table SC1.3 Use of compound fertiliser in Scotland 1993

	Ha. ('000)	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	4
Winter wheat	207	49	91	92	40	72	74	20	65	69	279
Spring barley	312	93	97	97	67	56	61	62	54	59	513
Winter barley	63	62	97	97	36	76	79	22	74	77	97
Oats	27	90	96	96	55	55	60	49	53	58	56
Rye	0	•	•	•	•	•	•	•	•	•	0
Early potatoes	6	91	91	91	175	175	222	160	160	203	9
Maincrop potatoes	35	95	95	95	159	171	229	152	163	218	68
Sugar beet	0	•	•	•	•	•	•	•	•	•	0
Oilseed rape	94	76	91	91	50	60	66	38	55	60	128
Linseed	4	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	16	96	97	97	76	106	88	74	104	86	59
Kale and cow cabbage	7	92	100	100	91	54	54	84	54	54	18
Other roots/green crops	13	93	99	99	87	74	71	81	73	70	27
Peas	11	30	72	72	18	49	57	5	36	41	14
Beans	3	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	6	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	6	37	37	37	77	95	126	29	36	47	15
Small fruit	1	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	0
Other tillage	3	•	•	•	•	•	•	•	•	•	7
All tillage **	+643	77	92	93	65	68	75	50	63	70	1316
Grass under 5 years	306	81	84	83	118	40	54	96	33	45	485
Grass 5 years and over	870	72	74	70	104	33	42	75	24	29	619
All grass	+1086	75	76	74	108	35	45	81	27	33	1104
All crops & grass **	+1729	75	82	80	93	48	57	70	39	46	2420

** Estimates on this row were 'post-stratified' using figures from the 1993 Agricultural Census for Scotland

+ Obtained directly from 1993 Agricultural Census

Source: British Survey of Fertiliser Practice 1993

Table SC1.4 Use of lime in Scotland 1993

	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	2	•	•	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	207	3.5	•	6.1	•	•	9.8	2.3	•	2.5	•	•	2.5	278
Spring barley	311	6.8	•	16.9	•	0.1	23.9	2.3	•	•	•	1.5	•	513
Winter barley	63	2.0	•	18.8	•	0.4	21.8	1.8	•	2.4	•	1.5	2.3	97
Oats	27	3.3	•	19.4	•	2.9	25.5	2.7	•	2.6	•	0.6	2.4	56
Rye	0	•	•	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	5	•	•	•	•	•	•	•	•	•	•	•	•	9
Maincrop potatoes	34	0.5	•	•	•	•	0.5	2.7	•	•	•	•	2.7	66
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	94	1.5	•	13.8	•	•	16.1	2.3	•	2.4	•	•	2.4	128
Linseed	4	•	•	•	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	15	2.7	•	6.3	•	•	9.5	1.5	•	2.3	•	•	2.1	59
Kale and cow cabbage	6	•	•	11.1	•	•	11.1	•	•	2.6	•	•	2.6	18
Other roots/green crops	12	•	•	3.4	•	•	3.4	•	•	1.6	•	•	1.6	27
Peas	10	•	•	12.2	•	•	12.2	•	•	3.0	•	•	3.0	14
Beans	3	•	•	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	5	•	•	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	6	9.3	•	•	•	•	9.3	2.7	•	•	•	•	2.7	15
Small fruit	0	•	•	•	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage	2	•	•	•	•	•	•	•	•	•	•	•	•	5
All tillage	813	4.1	•	12.5	•	0.2	17.0	2.3	•	•	•	0.9	•	1311
Grass under 5 years	305	3.3	•	4.3	•	0.2	7.9	2.7	•	2.8	•	0.2	2.7	485
Grass 5 years & over	870	0.7	•	4.8	•	•	5.6	3.1	•	2.8	•	•	2.8	619
All grass	1175	1.4	•	4.7	•	0.1	6.2	2.9	•	2.8	•	0.2	2.8	1104
All crops & grass	1989	2.5	•	7.9	•	0.1	10.6	2.5	•	•	•	0.7	•	2415

*Estimated area under crop

Source: 1993 British Survey of Fertiliser Practice

Table SC1.5 Percentage of crop area by field application rate – N (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	•	•	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	1	•	•	1	2	4	4	36	45	8	•	•	279
Spring barley	•	1	5	14	33	35	11	1	•	•	•	•	513
Winter barley	2	•	•	•	3	4	14	55	21	1	•	•	97
Oats	3	1	16	26	22	14	18	1	•	•	•	•	56
Rye	•	•	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	9	•	•	•	•	•	13	50	11	18	•	•	9
Maincrop potatoes	3	1	•	•	1	10	18	48	13	6	•	•	68
Sugar beet	•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	•	•	•	8	5	15	11	9	31	20	1	•	128
Linseed	•	•	•	•	•	•	•	•	•	•	•	•	5
Forage maize	•	•	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	3	2	4	50	25	5	3	8	•	•	•	•	59
Kale and cow cabbage	•	•	4	8	15	10	34	30	•	•	•	•	18
Other roots/green crops	1	•	•	20	12	39	16	7	•	5	•	•	27
Peas	70	24	6	•	•	•	•	•	•	•	•	•	14
Beans	•	•	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	•	•	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	9	•	•	21	22	8	7	17	17	•	•	•	15
Small fruit	•	•	•	•	•	•	•	•	•	•	•	•	4
Top fruit	•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage	•	•	•	•	•	•	•	•	•	•	•	•	7
All tillage	2	1	3	10	16	19	10	18	18	5	•	•	1316
Grass under 5 years	6	•	5	13	13	8	14	18	16	4	4	•	485
Grass 5 years and over	19	1	7	20	7	11	8	9	8	5	4	•	619
All grass	16	1	7	18	9	10	10	11	10	5	4	•	1104
All crops & grass	10	1	5	15	11	14	10	14	13	5	2	•	2420

Source : British Survey of Fertiliser Practice 1993

Table SC1.6 Percentage of crop area by field application rate – P_2O_5 (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	•	•	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	7	2	5	44	38	2	1	•	1	•	•	•	279
Spring barley	2	4	28	50	13	1	•	1	•	•	•	•	513
Winter barley	3	•	6	32	56	•	3	•	•	•	•	•	97
Oats	4	4	37	39	16	•	•	•	•	•	•	•	56
Rye	•	•	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	9	•	•	•	•	•	16	58	•	18	•	•	9
Maincrop potatoes	3	•	•	1	1	3	13	64	11	4	•	•	68
Sugar beet	•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	9	2	21	47	21	•	•	•	•	•	•	•	128
Linseed	•	•	•	•	•	•	•	•	•	•	•	•	5
Forage maize	•	•	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	3	•	3	10	39	19	8	11	3	2	2	•	59
Kale and cow cabbage	•	•	44	25	31	•	•	•	•	•	•	•	18
Other roots/green crops	1	4	6	38	20	24	•	7	•	•	•	•	27
Peas	28	5	17	51	•	•	•	•	•	•	•	•	14
Beans	•	•	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	•	•	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	11	•	•	28	5	22	17	17	•	•	•	•	15
Small fruit	•	•	•	•	•	•	•	•	•	•	•	•	4
Top fruit	•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage	•	•	•	•	•	•	•	•	•	•	•	•	7
All tillage	6	3	17	42	24	2	2	4	1	•	•	•	1316
Grass under 5 years	16	21	37	18	4	1	1	1	•	•	•	•	485
Grass 5 years and over	26	25	30	14	3	1	•	1	•	•	•	•	619
All grass	23	24	32	15	3	1	•	1	•	•	•	•	1104
All crops & grass	16	15	26	26	12	1	1	2	•	•	•	•	2420

Source : British Survey of Fertiliser Practice 1993

Table SC1.7 Percentage of crop area by field application rate – K_2O (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	•	•	•	•	•	•	•	•	•	•	•	•	4
Winter wheat	7	•	5	37	41	7	2	1	•	•	•	•	279
Spring barley	2	3	21	48	21	4	•	1	•	•	•	•	513
Winter barley	3	•	6	23	60	4	3	2	•	•	•	•	97
Oats	4	3	29	39	16	7	•	2	•	•	•	•	56
Rye	•	•	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	9	•	•	•	•	•	•	21	26	44	•	•	9
Maincrop potatoes	3	•	1	•	•	•	4	16	27	39	8	•	68
Sugar beet	•	•	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	9	•	19	46	19	1	5	2	•	•	•	•	128
Linseed	•	•	•	•	•	•	•	•	•	•	•	•	5
Forage maize	•	•	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	3	•	4	22	49	19	•	3	1	•	•	•	59
Kale and cow cabbage	•	•	44	33	23	•	•	•	•	•	•	•	18
Other roots/green crops	1	4	10	43	20	17	•	•	4	•	•	•	27
Peas	28	5	17	35	10	6	•	•	•	•	•	•	14
Beans	•	•	•	•	•	•	•	•	•	•	•	•	5
Vegetables (brassicae)	•	•	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	11	•	•	10	•	35	9	35	•	•	•	•	15
Small fruit	•	•	•	•	•	•	•	•	•	•	•	•	4
Top fruit	•	•	•	•	•	•	•	•	•	•	•	•	0
Other tillage	•	•	•	•	•	•	•	•	•	•	•	•	7
All tillage	5	2	14	39	28	5	2	3	1	2	•	•	1316
Grass under 5 years	16	15	32	13	11	8	4	•	1	•	•	•	485
Grass 5 years and over	30	22	28	8	6	2	4	•	•	•	•	•	619
All grass	26	20	29	9	8	4	4	•	•	•	•	•	1104
All crops & grass	18	13	23	21	16	4	3	1	1	1	•	•	2420

Source: British Survey of Fertiliser Practice 1993

Table SC2.1 Average fertiliser practice by grassland utilisation in Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed – not mown	755	77	68	64	26	109	29	27	84	19	17	619
Grazed – mown	399	97	92	92	64	173	47	69	169	43	64	448
All grazings	1155	84	76	74	39	134	36	45	114	28	33	1067
Cut for seed grazed	0	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	0	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	0	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	309	98	93	94	67	191	49	76	189	46	72	314
Cut for silage not grazed	4	100	100	100	45	120	40	55	120	40	55	11
All cut for silage	313	98	93	94	66	190	49	76	188	46	71	325
Cut for hay grazed	90	94	90	88	55	107	37	40	101	34	36	134
Cut for hay not grazed	7	91	86	86	8	103	31	31	94	27	27	20
All cut for hay	97	93	90	88	52	107	37	40	100	33	35	154
All mowings	411	97	92	92	63	171	46	68	167	43	63	479
All grass	1175	84	76	73	39	134	36	45	113	28	33	1104

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

Table SC2.2 Percentage of grass area by field application rate – N (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	22	1	9	25	8	9	9	8	5	•	3	•	619
Grazed – mown	2	1	1	7	10	13	11	17	19	13	7	•	448
All grazings	15	1	6	19	8	11	10	11	10	5	4	•	1067
Cut for seed grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	1	•	•	4	6	12	10	16	24	17	9	•	314
Cut for silage not grazed	•	•	•	18	50	•	•	10	6	15	•	•	11
All cut for silage	1	•	•	4	7	12	10	16	24	17	8	•	325
Cut for hay grazed	6	2	4	17	21	15	14	21	2	•	•	•	134
Cut for hay not grazed	9	•	13	15	45	•	•	5	•	13	•	•	20
All cut for hay	6	2	5	17	22	13	13	20	2	1	•	•	154
All mowings	2	1	1	7	11	12	11	17	18	13	6	•	479
All grass	16	1	7	18	9	10	10	11	10	5	4	•	1104

Source : British Survey of Fertiliser Practice 1993

Table SC2.3 Percentage of grass area by field application rate – P2O5 (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	31	30	27	9	2	•	•	•	•	•	•	•	619
Grazed – mown	8	14	41	28	6	2	1	1	•	•	•	•	448
All grazings	23	24	32	15	3	1	•	1	•	•	•	•	1067
Cut for seed grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	7	10	41	30	7	2	1	1	•	•	•	•	314
Cut for silage not grazed	•	•	79	18	•	3	•	•	•	•	•	•	11
All cut for silage	7	10	41	30	7	2	1	1	•	•	•	•	325
Cut for hay grazed	10	25	43	17	1	2	•	1	1	•	•	•	134
Cut for hay not grazed	13	33	37	17	•	•	•	•	•	•	•	•	20
All cut for hay	10	26	43	17	1	2	•	1	1	•	•	•	154
All mowings	8	14	41	27	6	2	1	1	•	•	•	•	479
All grass	23	24	32	15	3	1	•	1	•	•	•	•	1104

Source : British Survey of Fertiliser Practice 1993

Table SC2.4 Percentage of grass area by field application rate – K2O (Scotland 1993)

row % kg/ha	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	36	28	29	5	2	•	•	•	•	•	•	•	619
Grazed – mown	7	6	29	18	18	11	11	•	•	•	•	•	448
All grazings	26	20	29	9	8	4	4	•	•	•	•	•	1067
Cut for seed grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for seed not grazed	•	•	•	•	•	•	•	•	•	•	•	•	0
All cut for seed	•	•	•	•	•	•	•	•	•	•	•	•	0
Cut for silage grazed	6	3	25	18	22	13	14	•	•	•	•	•	314
Cut for silage not grazed	•	•	79	•	6	3	•	12	•	•	•	•	11
All cut for silage	6	3	25	18	21	12	14	•	•	•	•	•	325
Cut for hay grazed	11	17	44	18	4	5	•	•	•	•	•	•	134
Cut for hay not grazed	13	33	37	17	•	•	•	•	•	•	•	•	20
All cut for hay	11	18	44	18	4	4	•	•	•	•	•	•	154
All mowings	7	7	30	18	17	10	11	•	•	•	•	•	479
All grass	26	20	29	9	8	4	4	•	•	•	•	•	1104

Source : British Survey of Fertiliser Practice 1993

Table SC3.1 Product type as percentage of all product used by crop group in Scotland 1993

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	All crops & grass
Calcium Ammonium Nitrate	•	0.1	•	•	•	0.1	0.1	0.1	•	•	•	•	0.1
Urea	•	1.6	•	•	1.4	•	0.9	1.6	•	0.1	•	0.8	0.8
Ammonium Nitrate	18.5	56.6	0.5	•	49.8	16.3	37	25.3	17	14.3	•	19.4	28.2
Other Straight N	0.7	1.3	0.6	•	3.4	•	1.3	0.1	0.4	0.8	•	0.4	0.8
Triple Super Phosphate	0.6	0.3	•	•	•	3.7	0.6	0.2	0.8	0.2	•	0.2	0.4
Single Super Phosphate	•	•	•	•	•	•	•	0.6	•	•	•	0.3	0.1
Other Straight P	•	0.2	0.1	•	•	1.3	0.2	0.2	1.5	0.2	•	0.3	0.3
Muriate of Potash	0.5	0.6	•	•	0.5	2.8	0.7	•	0.3	0.3	•	0.2	0.4
Other Straight K	•	•	•	•	•	•	•	•	•	•	•	•	•
NP	0.1	0.1	•	•	•	0.6	0.1	5.4	•	1.7	•	3.2	1.7
NK	0.4	1	•	•	•	•	0.5	0.6	•	7.1	80.3	3.8	2.2
PK	3	17.5	•	•	7.2	6	9.6	0.8	3.4	1.4	•	1.3	5.4
Very High N	0.9	0.1	•	•	0.5	2.1	0.6	37	27.7	27.9	•	31.9	16.3
High N	31.1	2.6	0.1	•	3.8	16.3	11.9	23.2	34.1	34.4	•	29.2	20.6
High P	2.1	1.3	4.6	•	•	9.7	2.2	•	•	•	•	•	1.1
High K	11.9	0.2	82.2	•	5.4	15.5	12.2	0.4	0.7	0.7	19.7	0.6	6.4
Low N	5.3	12.2	0.5	•	12.4	15.1	9.4	1.8	1.3	0.1	•	1	5.2
Low P	1.7	0.7	•	•	2.1	0.5	1.1	0.3	3.4	9.2	•	4.7	2.9
Equal NPK	22.9	3.1	11.3	•	13.4	9.3	11.5	2.2	2.1	1.2	•	1.7	6.6
Unknown	0.2	0.3	•	•	•	0.7	0.2	0.2	7.3	0.5	•	0.9	0.6
Total prod ('000 tonnes)	**158**	**222**	**44**	•	**74**	**38**	**536**	**245**	**41**	**253**	**2**	**542**	**1078**

Source: British Survey of Fertiliser Practice 1993

Table SC3.2 Use of product type by crop group in Scotland 1993

('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	•	51.1	•	•	•	7.1	58.2	41.8	•	•	•	41.8	0.6
Urea	0.5	41.1	•	•	11.6	•	53.2	43.1	•	3.8	•	46.8	8.9
Ammonium Nitrate	9.6	41.5	0.1	•	12.1	2	65.3	20.5	2.3	11.9	•	34.7	303.4
Other Straight N	12.5	31.7	3	•	27.4	•	74.5	1.7	1.6	22.2	•	25.5	9.1
Triple Super Phosphate	22.5	17.2	•	•	•	31.6	71.3	10.8	7.1	10.8	•	28.7	4.4
Single Super Phosphate	•	•	•	•	•	•	•	100	•	•	•	100	1.5
Other Straight P	•	19.1	1.9	•	•	17	38	18.1	22.5	21.4	•	62	2.8
Muriate of Potash	17.3	31.4	•	•	8.4	23.6	80.7	1.9	3	14.4	•	19.3	4.5
Other Straight K	•	•	•	•	•	•	•	•	•	•	•	•	•
NP	0.9	1.4	•	•	•	1.3	3.5	73	•	23.4	•	96.5	18.2
NK	2.4	9.7	•	•	•	•	12	6.2	•	75.6	6.2	88	23.7
PK	8.2	67.1	•	•	9.2	3.9	88.3	3.4	2.4	5.9	•	11.7	58.0
Very High N	0.8	0.2	•	•	0.2	0.5	1.7	51.6	6.5	40.2	•	98.3	176.0
High N	22.2	2.6	•	•	1.3	2.8	28.8	25.6	6.3	39.2	•	71.2	222.0
High P	28.1	24.4	17	•	•	30.5	100	•	•	•	•	•	12.0
High K	27.4	0.5	52.9	•	5.8	8.5	95.2	1.4	0.4	2.4	0.5	4.8	68.6
Low N	15.1	48.5	0.4	•	16.4	10.2	90.6	7.8	1	0.7	•	9.4	55.8
Low P	8.3	5.2	•	•	4.9	0.6	18.9	2.7	4.5	74	•	81.1	31.5
Equal NPK	51.2	9.7	7.1	•	13.9	5	86.8	7.7	1.2	4.3	•	13.2	70.9
Unknown	4.8	9.7	•	•	•	4.5	19	8.3	48.8	20.7	•	77.8	6.0
Total product	**14.7**	**20.6**	**4.1**	•	**6.8**	**3.5**	**49.3**	**22.8**	**3.8**	**23.5**	**0.2**	**50.3**	**1077.6**

Source: British Survey of Fertiliser Practice 1993

Table SC3.3 Product use in Scotland by month of application – 1993

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product ('000 tonnes)
Calcium Ammonium Nitrate	•	•	51	•	42	•	•	7	•	•	•	•	9
Urea	•	10	47	34	1	1	6	2	•	•	•	•	8
Ammonium Nitrate	•	6	25	37	16	7	5	3	1	•	•	•	303
Other Straight N	•	35	29	34	•	2	•	•	•	•	•	•	9
Triple Super Phosphate	6	16	23	27	3	9	1	•	•	•	14	2	4
Single Super Phosphate	•	•	84	16	•	•	•	•	•	•	•	•	1
Other Straight P	•	•	28	•	10	33	•	29	•	•	•	•	2
Muriate of Potash	4	24	20	16	1	19	2	•	•	•	13	•	4
Other Straight K	•	•	•	•	•	•	•	•	•	•	•	•	.
NP	•	5	47	42	4	1	•	•	•	•	•	•	18
NK	•	5	5	7	3	59	19	1	•	•	•	•	23
PK	•	15	10	4	4	•	•	4	23	25	3	12	58
Very High N	•	•	17	37	13	16	9	8	•	•	•	•	175
High N	•	2	24	37	20	10	5	1	•	•	•	•	222
High P	•	•	19	26	28	1	•	•	24	2	•	•	11
High K	•	11	22	43	18	2	•	4	•	•	•	•	68
Low N	•	12	15	4	13	2	•	6	22	21	5	•	55
Low P	•	4	8	8	50	22	7	2	•	•	•	•	31
Equal NPK	•	4	35	34	8	4	•	6	2	4	•	•	70
Unknown	•	14	•	4	81	•	•	•	•	1	•	•	6
All fertilisers	•	5	22	32	16	9	5	4	3	3	1	1	1077

Source: British Survey of Fertiliser Practice 1993

Table SC4.1 Average fertiliser practice in North East Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	37	100	99	99	16	179	81	89	179	80	88	58
Spring barley	119	100	99	99	46	90	59	64	89	59	63	231
Winter barley	13	100	100	100	38	185	84	93	185	84	93	20
Oats	6	100	100	100	67	68	60	68	68	60	68	11
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	8	85	85	85	72	116	151	182	99	128	155	18
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	32	100	88	88	27	144	54	60	144	48	53	47
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	7	98	98	98	70	82	124	82	80	122	80	27
Kale and cow cabbage	0	•	•	•	•	•	•	•	•	•	•	0
Other roots/green crops	2	•	•	•	•	•	•	•	•	•	•	8
Peas	0	•	•	•	•	•	•	•	•	•	•	0
Beans	0	•	•	•	•	•	•	•	•	•	•	1
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	2
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	1	•	•	•	•	•	•	•	•	•	•	2
All tillage	226	99	97	97	40	117	69	74	116	67	71	425
Grass under 5 years	121	95	86	87	22	134	36	48	127	31	41	234
Grass 5 years and over	94	73	63	62	21	120	25	34	88	16	21	158
All grass	215	85	76	76	21	129	32	43	110	24	32	392
All crops & grass	441	92	87	86	31	122	53	60	113	46	52	817

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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 in South East Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	2	•	•	•	•	•	•	•	•	•	•	3
Winter wheat	159	100	92	92	15	199	71	74	199	65	68	199
Spring barley	135	100	96	96	18	99	56	62	99	53	59	197
Winter barley	43	100	96	96	12	175	75	79	175	72	77	68
Oats	15	100	95	95	20	92	53	56	92	50	53	30
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	4	•	•	•	•	•	•	•	•	•	•	8
Maincrop potatoes	26	99	99	99	47	175	176	241	173	173	238	43
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	60	100	93	93	10	205	63	73	205	59	67	75
Linseed	4	•	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	7	96	96	96	60	73	111	95	71	107	91	24
Kale and cow cabbage	4	100	100	100	35	110	61	57	110	61	57	10
Other roots/green crops	10	100	100	100	31	114	80	77	114	80	77	17
Peas	10	25	70	70	7	11	48	53	3	34	37	13
Beans	2	•	•	•	•	•	•	•	•	•	•	3
Vegetables (brassicae)	6	•	•	•	•	•	•	•	•	•	•	7
Vegetables (other)	6	93	91	91	26	132	109	130	123	99	118	13
Small fruit	1	•	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	0	•	•	•	•	•	•	•	•	•	•	1
All tillage	494	98	93	93	18	157	73	82	154	68	77	720
Grass under 5 years	93	97	80	81	22	147	41	57	143	33	46	144
Grass 5 years and over	296	77	66	63	24	108	36	35	83	24	22	197
All grass	389	82	69	67	24	119	37	42	97	26	28	341
All crops & grass	883	91	82	82	20	142	60	68	129	49	55	1061

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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 in South West Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	1
Winter wheat	7	85	89	89	44	163	76	79	138	68	71	14
Spring barley	37	99	99	99	67	80	43	47	79	42	46	48
Winter barley	8	•	•	•	•	•	•	•	•	•	•	9
Oats	4	•	•	•	•	•	•	•	•	•	•	9
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	1	•	•	•	•	•	•	•	•	•	•	1
Maincrop potatoes	0	•	•	•	•	•	•	•	•	•	•	5
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	1	•	•	•	•	•	•	•	•	•	•	2
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	1	•	•	•	•	•	•	•	•	•	•	5
Kale and cow cabbage	3	•	•	•	•	•	•	•	•	•	•	8
Other roots/green crops	0	•	•	•	•	•	•	•	•	•	•	2
Peas	0	•	•	•	•	•	•	•	•	•	•	0
Beans	0	•	•	•	•	•	•	•	•	•	•	1
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	1
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	2	•	•	•	•	•	•	•	•	•	•	4
All tillage	64	93	96	96	63	105	55	59	97	52	57	110
Grass under 5 years	80	89	86	86	72	180	48	66	160	41	56	84
Grass 5 years and over	437	87	85	80	60	148	37	47	128	31	38	228
All grass	516	87	85	81	62	153	38	50	133	33	41	312
All crops & grass	580	88	86	83	62	147	40	51	129	35	42	422

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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

Table SC5.1 Average fertiliser practice on general cropping farms in Scotland 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	•	•	•	•	•	•	•	•	•	•	•	3
Winter wheat	167	100	92	93	10	199	72	76	199	67	70	226
Spring barley	184	100	96	96	24	104	61	69	104	59	66	294
Winter barley	40	100	100	100	6	183	77	81	183	77	81	63
Oats	15	96	95	95	15	89	55	59	86	52	56	31
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	6	•	•	•	•	•	•	•	•	•	•	9
Maincrop potatoes	32	97	98	97	54	164	172	230	160	168	224	56
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	71	100	92	92	11	196	61	69	196	57	64	94
Linseed	4	•	•	•	•	•	•	•	•	•	•	5
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	5	100	100	100	36	79	127	100	79	127	100	22
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	2
Other roots/green crops	1	•	•	•	•	•	•	•	•	•	•	3
Peas	11	30	72	72	6	18	49	57	5	36	41	14
Beans	2	•	•	•	•	•	•	•	•	•	•	4
Vegetables (brassicae)	6	•	•	•	•	•	•	•	•	•	•	8
Vegetables (other)	6	93	93	93	23	130	109	131	121	101	122	12
Small fruit	1	•	•	•	•	•	•	•	•	•	•	4
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	1	•	•	•	•	•	•	•	•	•	•	3
All tillage	555	98	94	94	18	155	75	84	152	70	79	853
Grass under 5 years	68	94	79	80	11	157	43	67	147	34	54	127
Grass 5 years and over	66	75	49	50	12	114	38	39	86	18	20	107
All grass	134	85	64	66	11	138	41	57	117	26	37	234
All crops & grass	689	95	88	88	17	152	70	80	145	62	71	1087

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	8	100	84	84	31	188	66	86	188	56	72	14
Spring barley	21	98	98	98	56	74	43	46	73	42	45	39
Winter barley	6	•	•	•	•	•	•	•	•	•	•	8
Oats	1	•	•	•	•	•	•	•	•	•	•	2
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	0	•	•	•	•	•	•	•	•	•	•	3
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	3	•	•	•	•	•	•	•	•	•	•	5
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	0	•	•	•	•	•	•	•	•	•	•	1
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	4
Other roots/green crops	2	•	•	•	•	•	•	•	•	•	•	4
Peas	0	•	•	•	•	•	•	•	•	•	•	0
Beans	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	0
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	2	•	•	•	•	•	•	•	•	•	•	3
All tillage	45	98	95	95	49	126	59	71	124	56	68	83
Grass under 5 years	47	100	89	91	81	186	46	68	186	41	62	52
Grass 5 years and over	163	98	90	89	69	191	41	53	186	37	47	95
All grass	211	98	90	89	72	190	42	56	186	38	50	147
All crops & grass	256	98	91	90	68	179	45	59	175	41	53	230

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	0	•	•	•	•	•	•	•	•	•	•	0
Winter wheat	20	95	98	98	31	165	81	84	156	79	82	26
Spring barley	32	98	97	97	57	90	56	52	89	55	51	48
Winter barley	12	91	86	86	51	158	76	82	144	65	70	21
Oats	5	•	•	•	•	•	•	•	•	•	•	9
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	1	•	•	•	•	•	•	•	•	•	•	4
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	15	100	87	87	25	123	50	53	123	43	46	18
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	3	•	•	•	•	•	•	•	•	•	•	9
Kale and cow cabbage	1	•	•	•	•	•	•	•	•	•	•	1
Other roots/green crops	1	•	•	•	•	•	•	•	•	•	•	3
Peas	0	•	•	•	•	•	•	•	•	•	•	0
Beans	1	•	•	•	•	•	•	•	•	•	•	1
Vegetables (brassicae)	0	•	•	•	•	•	•	•	•	•	•	0
Vegetables (other)	0	•	•	•	•	•	•	•	•	•	•	3
Small fruit	0	•	•	•	•	•	•	•	•	•	•	0
Top fruit	0	•	•	•	•	•	•	•	•	•	•	0
Other tillage	0	•	•	•	•	•	•	•	•	•	•	0
All tillage	91	94	93	93	45	122	66	67	115	61	62	143
Grass under 5 years	62	91	80	80	20	145	39	51	132	31	41	91
Grass 5 years and over	151	65	61	61	21	106	28	28	70	17	17	107
All grass	213	73	67	66	21	120	32	36	88	21	24	198
All crops & grass	305	79	75	74	28	121	44	47	96	33	35	341

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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) 1993

	Ha.* ('000)	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	1	•	•	•	•	•	•	•	•	•	•	1
Winter wheat	11	100	100	100	72	174	73	86	174	73	86	13
Spring barley	75	100	100	100	46	77	50	55	77	50	55	132
Winter barley	4	•	•	•	•	•	•	•	160	79	79	5
Oats	6	100	100	100	64	75	46	55	75	46	55	14
Rye	0	•	•	•	•	•	•	•	•	•	•	0
Early potatoes	0	•	•	•	•	•	•	•	•	•	•	0
Maincrop potatoes	1	•	•	•	•	•	•	•	•	•	•	5
Sugar beet	0	•	•	•	•	•	•	•	•	•	•	0
Oilseed rape	5	100	86	86	38	123	59	59	123	51	51	11
Linseed	0	•	•	•	•	•	•	•	•	•	•	0
Forage maize	0	•	•	•	•	•	•	•	•	•	•	0
Turnips (stock)	7	100	100	100	77	73	107	74	73	107	74	27
Kale and cow cabbage	4	100	100	100	44	126	55	51	126	55	51	11
Other roots/green crops	8	100	100	100	31	111	77	66	111	77	66	17
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	123	100	99	99	49	94	59	61	94	59	61	237
Grass under 5 years	128	94	86	85	39	129	38	46	121	33	39	215
Grass 5 years and over	490	81	76	70	42	112	34	41	91	26	29	310
All grass	618	83	78	73	41	116	35	42	97	27	31	525
All crops & grass	741	86	82	78	43	112	40	46	97	33	36	762

*Estimated area under crop

Source: British Survey of Fertiliser Practice 1993

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