THE STATIONERY OFFICE

THE BRITISH SURVEY OF

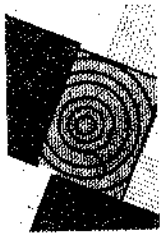
Fertiliser Practice

FERTILISER USE ON FARM CROPS FOR CROP YEAR 1996

MAFF Ministry of Agriculture Fisheries and Food

FMA Fertiliser Manufacturers Association

THE SCOTTISH OFFICE
Agriculture, Environment and Fisheries Department



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

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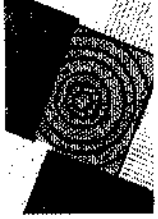

FOREWORD

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

The Survey is organised and funded jointly by the Fertiliser Manufacturers' Association (FMA), the Ministry of Agriculture, Fisheries and Food (MAFF) and the Scottish Office Agriculture, Environment and Fisheries Department (SOAEFD). 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 1996 Survey were carried out at the University of Edinburgh; the farm interviews in 1996 were undertaken by Produce Studies Ltd.

March 1997

ACKNOWLEDGEMENTS

The organisers gratefully acknowledge the co-operation of all farmers taking part in the Survey.

The authors of the report would like to thank all those involved for their assistance and support in the design, conduct and analysis of the 1996 British Survey of Fertiliser Practice.

The agronomic interpretation of the Survey results benefited from advice from Chris Dawson (Chris Dawson Associates) - Agronomic consultant to the Fertiliser Manufacturers' Association.

The authors would also like to thank the sponsors of the survey for their continuing support.

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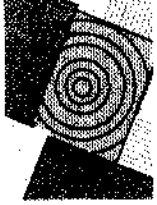

EXECUTIVE SUMMARY

The British Survey of Fertiliser Practice is an annual, nationally representative survey, based on the selection, each year, of a random stratified sample of about 1,500 farms from mainland Britain. The main purpose is to estimate average application rates of nitrogen, phosphate and potash used for agricultural crops and grassland. Information is also collected on applications of sulphur fertiliser products, organic manures and lime.

The main findings from the 1996 Survey for Great Britain are:

- Total nitrogen usage on tillage crops was 145 kg/ha, down by 4 kg/ha. On grassland it was 115 kg/ha, down by 3 kg/ha, following three successive years of gradual recovery from the substantial fall in usage on grassland in 1992.

- The nitrogen application rate on winter wheat and spring barley fell back from the 1995 high, and also fell on winter barley. The rate continued to decline on maincrop potatoes. The reduction on sugar beet was particularly pronounced. The overall rate on oilseed rape remained unchanged, confirming a recovery to 188 kg/ha.

- Total nitrogen usage applied to grass for silage fell by 13 kg/ha, down 7% to 172 kg/ha. Although the rate used for hay increased, the rate applied to grazed pasture also dropped, accompanied by a reduction in the extent of grassland used for grazing.

- The overall rates of application of phosphate and potash continued to remain comparatively stable, with minor reductions in the application of phosphate on some crop and grass types.

- There is now survey information on the use of fertilisers containing sulphur. This indicates an increase in the proportion of oilseed rape fields being dressed, and increases in the rate of application to cereals and oilseed rape.

In England and Wales, in 1996:

- There were reductions in the use of straight nitrogen on cereal crops, maincrop potatoes and sugar beet. (These were reflected in the reduced estimates given for overall nitrogen in Great Britain.)

Highlights of special interest in Scotland in 1996 include:

- Very large decreases in overall nitrogen rates on both tillage crops and grassland in comparison with 1995, when nitrogen use on tillage crops was at the highest recorded level since 1983.

- Small changes in phosphate and potash use on tillage crops but large decreases in application rates of both nutrients on grassland.

SECTION A - THE BRITISH SURVEY OF FERTILISER PRACTICE

A1 INTRODUCTION

The British Survey of Fertiliser Practice is the principal source of estimates for fertiliser applications in Great Britain. The Survey is used by the British fertiliser industry, by Government and by the wider agricultural community. Estimates from the survey may be used in conjunction with estimates of crop area from the annual agricultural Census[1], to estimate the amount of fertiliser used.

Rates of fertiliser application for 1996 are reported in detail in Section D. The Tables are grouped and referenced by geographic coverage: Great Britain (GB), England and Wales (EW) and Scotland (SC). There are tables covering the major crop groups, grassland, product types and farm types. Figures for 'total', 'straight', and 'compound' products are presented in separate tables. For example, Table EW 1.2 contains information on the application of straight nitrogen, phosphate and potash 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 based at the Edinburgh University Data Library - see Burnhill, Chalmers and Fairgrieve (1995)[2]. Publications with information on past survey results and trends include those by Chalmers, Kershaw and Leech (1990)[3], Church and Lewis (1977)[4] and Yates and Boyd (1965)[5].

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[1] Agricultural census data 1996 MAFF

[2] Burnhill, P M,Chalmers, A G & Fairgrieve, J (1995) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1994*, HMSO, Edinburgh 1995 ISBN 0 11 495304 X

[3] 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

[4] 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

[5] Yates, F & Boyd, D A (1965) 'Two decades of Surveys of Fertiliser Practice' *Outlook on Agriculture* 4 pp 20321

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

TRENDS

Commentary on results and trends is included in Section B of this report. Recent and past changes in agricultural policies and financing affect fertiliser practice and interpretative commentary is provided where there is evidence of this. Summary tables on both the average field rates and the overall rates of application have been included to illustrate possible changes in farmers' fertiliser practice.

SAMPLING

The 1996 British Survey of Fertiliser Practice involved the random selection of a nationally representative sample of 1,349 farm holdings in Great Britain (1115 from England and Wales and 234 from Scotland). As part of the selection process farms with less than 20 hectares of crops and grass were excluded from the survey. The remainder were stratified according to four size groups and five farm type groups (three for England and Wales and two for Scotland). 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 methodology and sampling variation).

FIELDWORK

The farms in the sample were visited by Produce Studies Ltd., who carried out interviews with farmers and farm managers between mid-June and September 1996, recording information on fertiliser use during the 1995-96 growing season. Information on about 13,000 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 no one outside the survey team may identify individual farm data.

A2 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 1995 to 30 September 1996, corresponding to the 1996 growing year or the post-1995 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 1995. Two areas within the same natural boundary receiving different treatments (crops or fertilisers) were recorded separately. Agricultural land which had been set aside under the Arable Area Payment Scheme was recorded, but was not included in analyses unless it was 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.

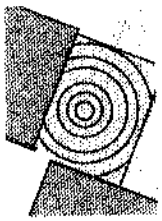
5. The abbreviation N is used for nitrogen; $P_2 0_5$ or P for phosphate; $K_2 0$ or K for Potash and FYM for farmyard manure. The phrase total use includes both straight and compound products.

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 estimates from the Agricultural Census, these overall application rates provide a means of estimating tonnages 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, 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 cannot be greater than the average field rate of application.



SECTION B – COMMENTARY ON FERTILISER USE IN GREAT BRITAIN

This commentary is about rates of application in mainland Britain of fertilisers containing nitrogen (N), phosphate (P_2O_5), potash (K_2O) and sulphur (SO_3) on tillage crops and grassland (excluding rough grazing). Section B1 of the report covers the five-year period 1992 to 1996, the period for which the data is available from a single source as the British Survey of Fertiliser Practice. Comments on longer term trends are made in Section B2, using data available from what earlier were two separate surveys of fertiliser practice, for England and Wales and for Scotland.

The survey estimates of overall application rates relate to usage on the farm during the 1996 growing season: they form the basis of estimates of tonnages used when combined with statistics on crop areas from the annual Agricultural Census(es). Dependent on the level of stocks held, those estimates of volume translate into indicators of sales of fertiliser products bought in preparation for the next growing season. The estimates of the average field rates provide a more direct indication of actual agronomic practice.

The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 8.9 Mha in England and Wales and about 1.8 Mha in Scotland. In what is otherwise a commentary on Britain as a whole, remarks on the separate countries are only made to highlight particular trends of interest. Readers interested in recent trends for Scotland, or for England and Wales, can use the tables in section D of this report in conjunction with the summary tables in the 1995 report[1].

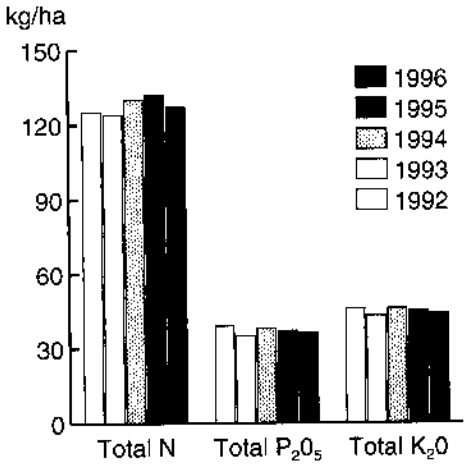
[1] Burnhill P M, Chalmers A G and Fairgrieve J (1996) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1995.* HMSO: Edinburgh.

B1 RECENT TRENDS, 1992 - 1996

B1.1 Overview of fertiliser use on all crops and grass

The statistics reported in Table B1.1 for the all crops and grassland category are illustrated in Figure B1.1. Definitions of terms used are set out in the previous section, Section A.

Figure B1.1 Overall fertiliser usage on all crops & grass, Great Britain 1992-1996



B1.1.1 NITROGEN

Table B1.1 Overall nitrogen usage Great Britain 1992 -1996

Total nitrogen (kg/ha)

	tillage	*grass*	*all crops and grass*
1992	145	106	125
1993	137	112	124
1994	147	116	130
1995	149	118	132
1996	145	115	128

Straight nitrogen (kg/ha)

tillage	*grass*	*all crops and grass*
123	51	86
113	56	82
120	51	84
125	52	85
121	53	84

Compound nitrogen (kg/ha)

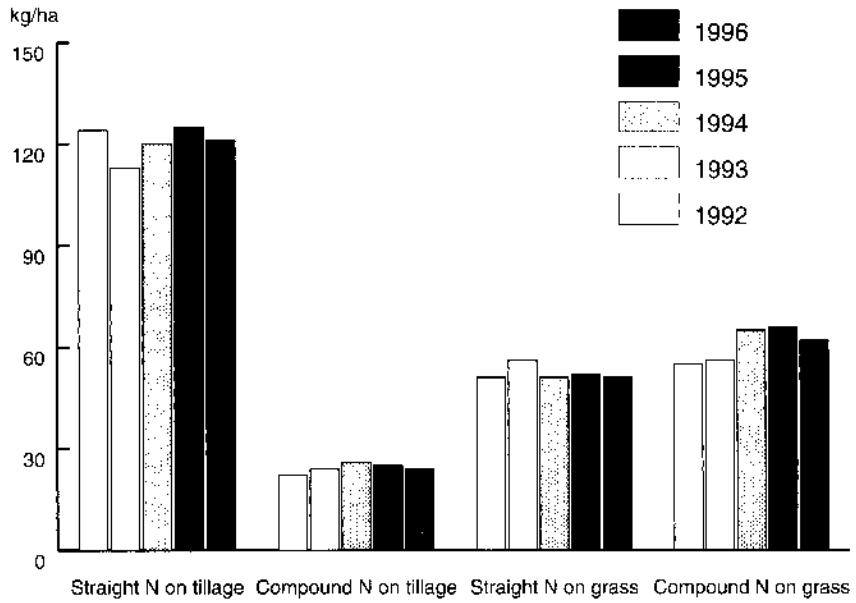
	tillage	*grass*	*all crops and grass*
1992	22	55	39
1993	24	56	41
1994	26	65	47
1995	25	66	47
1996	24	62	45

The overall rate of use of total N on all crops and grass dropped in 1996 by 4 kg/ha, to 128 kg/ha (Table B1.1). The decline in the rate of total nitrogen usage reflected two factors: a fall from the 1995 increase in application rates of straight nitrogen on tillage crops; and a reduced compound nitrogen rate on grassland (Figure B1.2).

The overall application rate of total nitrogen on tillage crops was 145 kg/ha in 1996, down by 4 kg/ha. On grassland it was 115 kg/ha, down by 3 kg/ha, following three successive years of gradual recovery from the substantial fall in usage on grassland in 1992 experienced in England and Wales.

In Scotland, there was a dramatic fall in the overall nitrogen use on tillage crops in 1996, to 122 kg/ha, the lowest recorded figure since 1986, down from the record level of 140 kg/ha reported in 1995. In the previous period, 1992-94, total nitrogen rates had been in the range of 125 to 130 kg/ha.

Figure B1.2 Straight and Compound nitrogen usage, Great Britain 1992 -1996



Overall application rates of straight nitrogen on tillage crops over the last five years have been in the range of 120 to 125 kg/ha, except for the low of 113 kg/ha in 1993. On grassland, the yearly straight nitrogen rate was around 51 kg/ha, except in 1993 when the overall rate rose to 56 kg/ha because of an increase, in England and Wales, in the proportion of land receiving a dressing of straight nitrogen fertiliser[2].

There has been little net change in the use of compound nitrogen on tillage in the period since 1992 (Figure B1.2). Compound nitrogen rates on grassland, however, have increased over the period, from 55 kg/ha to 62 kg/ha, despite the recent reduction of 4 kg/ha in 1996.

The total nitrogen rate on tillage crops in 1996 was at about the same level as in 1992 (at around 145 kg/ha), but it has varied by up to 12 kg/ha during this five year period. For example, there was a large, temporary decrease in 1993, the combined result of a sharp fall, in England and Wales, in straight nitrogen use and a fall in the proportion of the total tillage area cropped with cereals and oilseed rape. The latter may be attributed to the introduction of the Arable Area Payment Scheme and widespread uptake of rotational set-aside. This change in cropping pattern also contributed to the decrease in overall nitrogen rate on the all tillage category that year.

In 1996, the annual rise in the rate of nitrogen applied to grassland in Great Britain over the period 1992 to 1995 came to an end. This rise, from 106 kg/ha to 118 kg/ha, represented only a partial recovery in the overall rate, as the figure recorded for 1992 in England and Wales was very low in comparison with estimates for the previous three years: 132 kg/ha in 1990; 104 kg/ha in 1992. The low figure for 1992 was attributed at the time to a decrease in dressing cover, rather than to any major change in average field rate[3].

[2] Burnhill P M, Chalmers A G and Fairgrieve J (1994) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1993.* HMSO: Edinburgh.

[3] Burnhill P M, Chalmers A G and Fairgrieve J (1993) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1992.* HMSO: Edinburgh.

B1.1.2 PHOSPHATE AND POTASH

Table B1.2 Overall phosphate and potash usage, Great Britain 1992 - 1996

Total phosphate (kg/ha)				Total potash (kg/ha)		
tillage	*grass*	*all crops and grass*		*tillage*	*grass*	*all crops and grass*
54	22	38	*1992*	63	28	45
52	21	35	*1993*	60	29	43
53	24	38	*1994*	63	31	46
53	24	37	*1995*	61	31	45
52	23	36	*1996*	61	30	44

In 1996 there was little change in the overall rates of phosphate and potash. Annual overall rates of phosphate and potash have varied by 2-3 kg/ha between 1992 and 1996: there is some indication of net decreases, of 2 kg/ha, in the application rate for both nutrients on tillage crops over the period and slight increases of 1-2 kg/ha on grassland (Table B1.2).

B1.2 Fertiliser use on major tillage crops

Overall and average field rates of fertiliser for major tillage crops in Great Britain over the past five years are summarised in Tables B1.3 and B1.4. More detailed statistics for 1996 are presented in Section D.

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

B1.2.1. NITROGEN

Winter Wheat

The overall rate of nitrogen applied to winter wheat has been very consistent over the past five years, at around 185 kg/ha, except in 1995, when the rate rose to 193 kg/ha (Table B1.3). In 1996, the overall rate fell back to 185 kg/ha. The average field rate, which is a more direct reflection of farmer's practice, has been similarly consistent, but, in 1996, dropped back by 5 kg/ha to 188 kg/ha (Table B1.4). The rise in the average rate for total nitrogen observed in 1995 for Britain was due to an increase in England and Wales in the average field rates and a change in their distribution. The proportion of crop area receiving less than 100 kg/ha declined and the proportion receiving over 200 kg/ha increased. The subsequent return, in 1996, to the more usual overall application rate was the result of changes in field application rates for both straight and compound nitrogen products.

In general, the overall application rate of compound nitrogen products to winter wheat since 1992 had been increasing, until the fall reported for 1996 for both compound and straight nitrogen products.

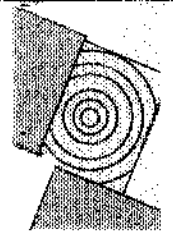


Table B1.3 Overall fertiliser usage on major tillage crops, Great Britain 1992 - 1996

Total nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	186	91	142	172	196	115
1993	185	92	137	185	180	110
1994	186	95	143	194	179	122
1995	193	99	144	176	188	118
1996	185	94	140	171	188	107

Straight nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	178	32	130	22	178	88
1993	173	40	124	30	160	86
1994	170	45	125	42	156	92
1995	177	45	130	33	165	96
1996	174	41	125	25	168	84

Compound nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	8	59	13	150	18	27
1993	12	52	13	158	20	24
1994	15	50	18	152	23	30
1995	16	54	14	143	22	22
1996	11	52	16	146	20	23

Total phosphate (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	52	47	57	187	55	59
1993	52	47	52	182	52	58
1994	52	42	52	194	50	57
1995	51	47	53	185	49	51
1996	51	47	52	178	52	40

Total potash (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	50	43	62	264	53	136
1993	49	55	61	256	50	139
1994	53	52	62	254	52	127
1995	52	55	63	255	50	111
1996	53	56	60	248	~~52~~ 49	96

Table B1.4 Average field rates on major tillage crops, Great Britain 1992 - 1996

Total nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	188	92	143	181	197	122
1993	186	94	138	191	181	115
1994	187	96	144	197	182	127
1995	194	99	145	182	190	122
1996	188	96	143	180	197	112

Straight nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	182	69	137	113	183	107
1993	178	72	131	114	170	105
1994	175	78	134	123	169	108
1995	184	76	136	108	175	113
1996	179	77	137	111	183	100

Compound nitrogen (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	40	69	47	166	44	80
1993	47	66	46	172	45	72
1994	44	66	45	173	46	86
1995	52	65	44	163	50	77
1996	48	67	51	162	50	74

Total phosphate (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	69	51	67	197	67	77
1993	68	52	66	191	64	74
1994	68	49	68	208	65	80
1995	66	51	63	192	63	70
1996	68	53	64	190	65	67

Total potash (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*	*oilseed rape*	*sugar beet*
1992	74	58	77	263	72	152
1993	71	60	73	268	66	156
1994	73	59	76	270	70	144
1995	72	59	75	265	69	133
1996	74	62	73	259	67	129

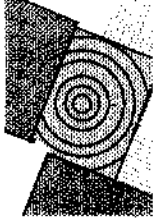


Table B1.5 Average field application rates of nitrogen on cereals by market use, Great Britain 1992 - 1996

Total nitrogen (kg/ha)

	winter wheat		*spring barley*		*winter barley*	
	milling	*non milling*	*malting*	*non malting*	*malting*	*non malting*
1992	197	186	94	90	124	149
1993	198	183	95	93	118	145
1994	208	189	97	95	133	157
1995	205	191	102	96	132	152
1996	198	185	97	93	129	152

Nitrogen fertiliser requirements for winter wheat depend on intended end use and expected yield level, as well as upon soil type and the residual nitrogen fertility from previous cropping. For example, between 1992 and 1996, the application rate of nitrogen on milling wheats was 11 to 19 kg/ha higher, on average, than on other (feed or seed) wheats (Table B1.5). Milling varieties are usually grown as second wheats and often receive extra nitrogen, either as a solid dressing or late foliar urea spray, in order to improve the chances of achieving an adequate grain protein content for a milling premium. It is the high yielding feed crops, rather than lower yielding milling varieties, which are normally grown as first winter wheats, after a break crop, in order to exploit the yield potential and the larger nitrogen supply in the soil. However, what is clear from Table B1.5 is that, in 1996, average field rates fell on winter wheat grown for both milling and non-milling purposes.

Crop area estimates from this Survey suggest that 20% of the winter wheat area in Great Britain was grown for milling use in 1996 (Table B1.6), unchanged from 1995. The Home-Grown Cereals Authority (HGCA) estimated that 14% of the total winter wheat area in the United Kingdom (UK) was planted to Group 1 (i.e. favoured for breadmaking) varieties[4]; in 1995 their estimate was 16%.

Table B1.6 Percentage distribution of cereal crop area, Great Britain 1992 - 1996

Crop area (%)

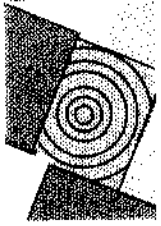
	winter wheat		*spring barley*		*winter barley*	
	milling	*non milling*	*malting*	*non malting*	*malting*	*non malting*
1992	21	79	47	53	23	77
1993	24	76	50	50	29	71
1994	26	74	53	47	29	71
1995	20	80	63	37	32	68
1996	20	80	65	35	30	70

SPRING BARLEY

The overall rates of total nitrogen application on spring barley have been increasing over the years since 1992, reaching a peak of 99 kg/ha in 1995 (Table B1.3). During the period, overall rates of straight nitrogen have increased, but compound nitrogen rates have declined, consistent with a possible shift towards more top dressing of crop nitrogen requirement and less application of seedbed nitrogen as compound fertiliser.

The average field rates of application of nitrogen fertiliser on the spring barley which is grown for malting were consistently higher than those for other, non-malting (feed and seed) types of spring barley (Table B1.5).

[4] HGCA Weekly Digest, Volume 23, No.2, 8 July 1996.



- On face value this is contrary to expectation as lower rates are recommended for spring malting barley, for given conditions of soil type and nitrogen fertility level, than for the feed varieties of barley crops[5]. This is done in order to reduce the risk of high grain nitrogen content which would adversely affect some malting processes. However, malting crops are normally grown on soils with low nitrogen fertility and the average field rates of nitrogen reported for malting varieties over the period are generally in the range recommended for mineral soil types with low nitrogen residues (90-100 kg/ha).

- Feed crops, on the other hand, are often grown in more fertile conditions, with mixed rotations which need less nitrogen fertiliser and this may explain why the average rate actually applied is higher on malting than on other types of spring barley. Estimates from this survey suggest that 65% of the spring barley area in Great Britain was grown for malting in 1996 (Table B1.6), very close to the corresponding HGCA estimate for the UK.[6]

WINTER BARLEY

In the period 1992 to 1995, the overall application rate for total nitrogen on winter barley has varied little from 143 kg/ha, apart from a temporary drop to 137 kg/ha in 1993 (Table B1.3). In 1996, it fell to 140 kg/ha, because of a fall in the average field rate, down to the same level reported in 1992 (Table B1.4). Overall rates for both straight and compound nitrogen have fluctuated over the period. The overall rate for straight nitrogen has tended to decrease, while that for compound nitrogen has gone up slightly. However, the average field rates for straight nitrogen have been slowly returning to the 1992 level of 137 kg/ha, indicating that the dressing cover for straight nitrogen has been declining.

Field application rates of nitrogen vary according to intended market use: rates for malting winter barleys, in the period from 1992 to 1996, were less on average, by 20 to 27 kg/ha, than for other types of winter barleys (Table B1.5). In 1996, 30% of the winter barley crop area was grown for malting in Great Britain (Table B1.6).

MAINCROP POTATOES

Overall total rates of nitrogen have varied widely over the last five years, from 171 to 194 kg/ha (Table B1.3); this reflects the variation in the average field rate (Table B1.4). In 1996, the average field rate was slightly down on 1995, confirming the drop back to the 1992 level, after two years of apparently high rates in 1993 and 1994. Most use is through dressings of compound nitrogen products, rather than as straight nitrogen, and the field rates for compound nitrogen were lower in 1995 and 1996 than they were in previous years, as is evident in the overall rates. In 1996, there was a reduction in the proportion of area of main crop potatoes receiving a dressing of straight nitrogen, leading to a reduction in the overall rate for total nitrogen on potatoes.

OILSEED RAPE

The overall rate for total nitrogen on oilseed rape in 1996 remained unchanged, confirming the recovery in 1995, although not yet back to the estimated rate for 1992 (Table B1.3). The average field rate of application, however, is now back to the 1992 level (Table B1.4). In 1995, a rise in the average field application rate of total nitrogen resulted in an increase of 9 kg/ha in the overall rate. In 1996, however, the impact of a further increase in the field application rate was masked by a decline in the proportion of the oilseed rape crop receiving a dressing of nitrogen. Consequently, the overall rate remained unchanged at 188 kg/ha.

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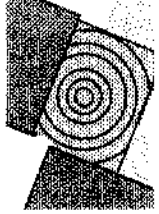
[5] Fertiliser Recommendations for Agricultural and Horticultural Crops. MAFF Reference Book 209 (Sixth edition). HMSO, London; (Nitrogen Index 0)

[6] HGCA Weekly Digest, Volume 23, No.2, 8 July 1996.



Changes in total nitrogen rate on oilseed rape since 1992 largely reflect the changes in the use of straight nitrogen products. The overall rate for straight nitrogen declined in 1994, to 156 kg/ha, but it has since recovered to 168 kg/ha. The smaller usage of compound products moved in the opposite direction. The average field rate of application of straight nitrogen products has now fully recovered to 183 kg/ha, and average field rate of application of compound products has stabilised at 50 kg/ha.

The increase, in 1995, in the overall rate of total nitrogen use on oilseed rape, sustained in 1996, can be attributed to a shift away from spring sowing, resulting in a larger proportion of winter crop, which, on average, receives a much higher field rate of application (Table B1.7). The increases in rapeseed commodity prices, and subsequent economic incentive to raise yield, may also have encouraged the higher rate of application evident on spring oilseed rape.

Table B1.7 Average field application rates of nitrogen on oilseed rape and percentage distribution of crop area, Great Britain 1992 - 1996

	Total nitrogen (kg/ha)		*% crop area*	
	winter sown	*spring sown*	*winter sown*	*spring sown*
1992	209	123	87	13
1993	212	121	66	34
1994	212	121	66	34
1995	210	121	79	21
1996	212	127	81	19

The earlier decrease, in the 1993 and 1994 seasons, in total nitrogen use on oilseed rape (Table B1.3), was attributed in previous reports to the effects of the introduction of the Transitional Oilseeds Scheme in 1992 and its subsequent inclusion into the Arable Area Payment Scheme[7] in the following year. The change within these schemes in the system of subsidy payment, from a tonnage-based system to one based upon area, led to the commodity price for rapeseed being halved, with a consequent reduction in the economic incentive to achieve maximum yield.

The small range of variation observed in the overall application rate of total nitrogen on oilseed rape in Britain is the net effect of a continued increase in the rate in England and Wales (up from 187 kg/ha to 190 kg/ha) and a decrease in Scotland (down to 175 kg/ha from the high rate of 190 kg/ha recorded in 1995.

SUGAR BEET

Overall rates of application for sugar beet have fluctuated over the past five years (Table B1.3): the drop recorded in 1993 to 110 kg/ha was followed by recovery over the next two seasons to levels around 120 kg/ha, and then by a significant decrease, to 107 kg/ha, in 1996. This sequence reflects changes in the average field rate for total nitrogen, which fell by 10 kg/ha from 122 kg/ha in 1995 to 112 kg/ha in 1996. Most of the fall in 1996 was due to a reduction in the rate of straight nitrogen use. In contrast, overall rates of compound use have held steady, albeit with a declining average field rate of application.

B1.2.2 PHOSPHATE AND POTASH

Overall rates of phosphate (P_2O_5) applied to winter wheat have been highly consistent in the period since 1992, at about 51 kg/ha (Table B1.3), with field-specific averages of about 68 kg/ha (Table B1.4). Total phosphate rates for spring barley were also stable at 47 kg/ha, although the rate dropped to 42 kg/ha in 1994. However, phosphate use on maincrop potatoes has varied over the period, falling back in the past two years to an

[7] MAFF (1992). Arable Area Payments 1992/93. Explanatory Guide. London: MAFF Publications, HMSO.

overall rate of 178 kg/ha and a field rate average of 190 kg/ha. For oilseed rape, overall phosphate rates over the past four years have been in the range of 49 to 52 kg/ha, and the average field rates at about 64 kg/ha. Rates of phosphate use on sugar beet have declined significantly since 1992, particularly over the last two years, down to 40 kg/ha in 1996. Field applications to winter barley remained consistent until 1994, but have declined marginally over the last two years.

Overall application rates of potash (K_2O) on the major cereals and on oilseed rape have, for the most part, been very consistent over the last five years: at about 52 kg/ha for winter wheat, 55 kg/ha for spring barley, 62 kg/ha for winter barley and at 52 kg/ha for oilseed rape (Table B1.3). Potash use on maincrop potatoes has varied from 248 to 256 kg/ha, a smaller fluctuation than the 16 kg/ha variation in the annual overall rate of phosphate. The overall potash rate on sugar beet has declined markedly over the period, from 136 kg/ha in 1992 to 96 kg/ha in 1996.

In 1996, the reductions in the overall application rates on tillage crops in Scotland were appreciable: phosphate down 3 kg/ha and potash down by 9 kg/ha.

B1.2.3 SULPHUR

Sulphur is an essential nutrient required for plant growth, and the risk of sulphur deficiency is becoming increasingly prevalent. The sulphur supply which is available to crops depends upon residual levels in the soil augmented by sulphur inputs from atmospheric deposition (wet and dry), sulphur released through the mineralisation of organic matter and applications of fertiliser containing sulphur. Plants derive a significant amount of their sulphur requirement from atmospheric sources, and measures taken in support of public policy to reduce sulphur dioxide emissions and associated atmospheric pollution have caused a steady decline in annual levels of atmospheric sulphur deposition over the past twenty years. This trend is expected to continue into the future. Crops with a large sulphur requirement are at particular risk from sulphur deficiency if they are grown on sandy or shallow soils, if they are in areas of Britain where atmospheric deposition is now less than 50 kg/ha sulphur (as SO_3) per annum[8], or if they receive little or no organic manure. The risk of sulphur deficiency is greater in Scotland than elsewhere in Great Britain, because of the lower rates of atmospheric sulphur deposition.

Sulphur in fertilisers is an important supplement for crop growth, especially for such crops as oilseed rape, cereals and intensively cut grass which have a higher sulphur requirement. The survey has only gathered information on sulphur since 1993 (Table B1.8) and this indicates that the proportion of crop area receiving additional sulphur has increased for winter cereals and oilseed rape, although not, apparently, for spring barley. Estimates of average field rate for sulphur show no clear trend for applications. Nevertheless, it does look as though the use of sulphur will become more prevalent in future, as an awareness of potential deficiency becomes more widespread and a wider range of soil types become affected.

[8] McGrath, S P, Zhao, F J and Withers, P J A (1996). Development of sulphur deficiency in crops and its treatment. *Proceedings No. 379.* The Fertiliser Society, Peterborough

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on major tillage crops, Great Britain 1993 - 1996

Dressing Cover (%)

	winter wheat	*spring barley*	*winter barley*	*oilseed rape*
1993	4	6	3	8
1994	6	7	7	11
1995	11	11	11	22
1996	8	7	10	30

Average field rate (kg/ha)

	winter wheat	*spring barley*	*winter barley*	*oilseed rape*
1993	20	17	24	32
1994	28	32	34	63
1995	29	30	29	45
1996	46	26	47	48

Average field rates for winter cereals had been similar to the amounts recommended for potentially deficient crops, 25 to 35 kg/ha SO_3 (as a water soluble form), but in 1996 the average rates being recorded increased, by about 17 kg/ha. Oilseed rape has a larger sulphur requirement than cereals with 75 kg/ha SO_3 being recommended where there is a risk of deficiency. Average field rates over the 1993-96 period have, however, been consistently less than the recommended amount of sulphur (Table B1.8). A greater percentage of crop area was dressed with fertiliser containing sulphur in Scotland in 1996: 46% of oilseed rape; about 20% of winter wheat and winter barley; and 8% of spring barley.

B1.3 Fertiliser use on grassland

Overall fertiliser usage, previously shown in Table B1.1, is repeated below in summary form as Table B1.9 The corresponding estimates of dressing cover are shown in Table B1.10

Table B1.9 Overall fertiliser usage on grassland, Great Britain 1992 - 1996 (kg/ha)

	straight nitrogen	compound nitrogen	total nitrogen	total phosphate	total potash
1992	51	55	106	22	28
1993	56	56	112	21	29
1994	51	65	116	24	31
1995	52	66	118	24	31
1996	53	62	115	23	30

Table B1.10 Dressing cover on grassland, Great Britain 1992 - 1996 (%)

	straight nitrogen	compound nitrogen	total nitrogen	total phosphate	total potash
1992	36	59	77	63	39
1993	44	59	80	61	40
1994	39	64	81	64	42
1995	43	66	84	68	44
1996	42	66	86	68	47

B1.3.1 NITROGEN

The overall rate of total nitrogen use on grassland in Great Britain was 115 kg/ha in 1996, down by 3 kg/ha, due to a drop in the use of compound nitrogen (Table B1.9). This marked the end of the recovery in nitrogen use since the dramatic fall in 1992, which was largely brought about by the fall in the dressing cover for straight nitrogen in England and Wales. The dressing cover for straight nitrogen has subsequently recovered and the dressing cover for compound nitrogen has also increased over the last three years (Table B1.10).

Nutrient requirements and usage vary according to the different purposes for which grass is grown. For example, grass is predominantely grown for grazing (Table B1.11), and during the period 1993-96, the average field rate of total nitrogen from manufactured fertiliser applied to grazed grass was in the range 133 to 136 kg/ha; it was 128 kg/ha in 1996 (Table B1.12). The average field rate applied for silage production was much higher, in the range 180 to 190 kg/ha; it was 178 kg/ha in 1996. For hay the rate applied has been lower, in the range 107 to 110 kg/ha.

The distribution of the total grassland area between grazing and cutting management regimes in the survey is summarised in Table B1.11. These should not be taken as authoritative national estimates of grassland utilisation, as the survey is designed to estimate application rates, not crop areas. However, it is clear that the percentage of grass being used for grazing dropped sharply in 1996, as it had in 1994, to 88%. The percentage of grazed grass had been consistently high in 1992 and 1993, and even higher than that in previous years, as stated in earlier reports. The proportion of grassland cut for silage has gradually increased from 26 to 30 percent over the 1992-96 period, but the percentage cut for hay has remained steady at 11-12 percent, apart from a small, temporary increase in 1995.

Table B1.11 Grassland utilisation, Great Britain 1992 - 1996 (% of grass area)

	grazed[1]	*silage*[2]	*hay*[2]
1992	95	26	11
1993	96	28	11
1994	87	29	12
1995	91	29	14
1996	88	30	12

[1] may also be mown
[2] may also be grazed

- The explanation offered for the earlier fall in the percentage of grass being used for grazing was the wet spring in 1994, which had resulted in surplus grass production for grazing requirements, and which was thought to have led to farmers taking more first silage cuts than usual. A number of factors could be considered as contributing to the drop in 1996. In 1996 there was a cold, dry spring which produced low yields of first cut silage and farmers took extra cuts later in the season to obtain sufficient conserved forage for winter feeding. Also, feed requirements for the 1996 - 97 winter were increased on many livestock farms where cattle were kept longer than normal because of the measures implemented in 1996 to eradicate future incidence of bovine spongiform encephalopathy (BSE) in the national cattle herd.

After dropping to 102 kg/ha in 1992, largely because there was a reduction in the dressing cover in England and Wales from 82% to 75%. The overall rate of nitrogen application on grazed grass in recent years has fluctuated in the range 108 to 114 kg/ha (Table B1.12). In 1996, the overall rate fell to 110 kg/ha. This was a result of the fall in the average field rate, not a change in the dressing cover (Table B1.10), and was associated with a reduction in the application of compound nitrogen products (Table B1.13). As stated, this fall coincided with a reduction in the percentage of grassland used for grazing.

The overall rate of nitrogen application on grass cut for silage has fluctuated in recent years, reaching 185 kg/ha in 1995 and falling to 172 kg/ha in 1996 (Table B1.12), with reductions in the overall rate of application for both straight and compound nitrogen products (Table B1.13). The percentage of grassland used for silage production has, however, slowly increased, reaching 30% in 1996.

Only about 12% of grass is cut for hay and the overall application rates for grass cut for hay are lower than those for silage, fluctuating in recent years in the range 83 kg/ha to 94 kg/ha, due largely to variations in the use of straight nitrogen.

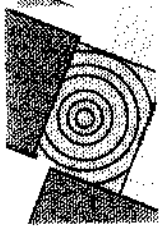


Table B1.12 Fertiliser application rate by grassland utilisation, Great Britain 1992 - 1996

Total nitrogen (kg/ha)

Overall application rate				Average field rate		
grazed[1]	silage[2]	hay[2]		grazed[1]	silage[2]	hay[2]
102	180	85	*1992*	132	190	107
111	174	91	*1993*	138	180	109
108	177	83	*1994*	133	185	107
114	185	88	*1995*	136	187	110
110	172	94	*1996*	128	178	107

Total phosphate (kg/ha)

Overall application rate				Average field rate		
grazed[1]	silage[2]	hay[2]		grazed[1]	silage[2]	hay[2]
22	36	21	*1992*	36	45	34
20	32	20	*1993*	33	42	34
21	36	19	*1994*	34	46	32
23	35	21	*1995*	34	43	33
22	34	21	*1996*	33	43	31

Total potash (kg/ha)

Overall application rate				Average field rate		
grazed[1]	silage[2]	hay[2]		grazed[1]	silage[2]	hay[2]
28	59	27	*1992*	45	72	44
28	57	24	*1993*	46	71	40
27	61	23	*1994*	44	73	38
28	61	26	*1995*	44	72	42
27	58	26	*1996*	42	69	40

Table B1.13 Straight and compound nitrogen use by grassland utilisation, Great Britain 1992 - 1996

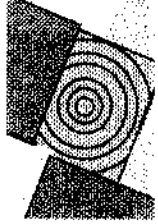
Straight nitrogen (kg/ha)

Overall application rate				Average field rate		
grazed[1]	silage[2]	hay[2]		grazed[1]	silage[2]	hay[2]
44	75	36	*1992*	125	139	109
55	78	47	*1993*	126	131	105
49	70	37	*1994*	125	128	111
50	74	39	*1995*	120	124	101
52	71	46	*1996*	125	127	106

Compound nitrogen (kg/ha)

Overall application rate				Average field rate		
grazed[1]	silage[2]	hay[2]		grazed[1]	silage[2]	hay[2]
57	105	48	*1992*	98	135	80
56	95	43	*1993*	94	126	76
59	107	45	*1994*	93	132	77
63	111	49	*1995*	97	135	80
58	101	48	*1996*	90	129	79

[1] may also be mown
[2] may also be grazed



B1.3.2 PHOSPHATE AND POTASH

Overall rates of phosphate and potash on grassland have increased slightly since 1992 (Table B1.9). The average field rate for phosphate on grass has changed little over the last four years, although field rates for grazing and silage were lower in 1996 than they were in 1992 (Table B1.12). However, changes in dressing cover have meant that overall rates are little changed.

Potash use has been very steady on grazed grass at around 27 kg/ha, but overall potash rates on cut grass have varied by up to 4 kg/ha between years, with a fall in 1996 in the application rate of potash on grass cut for silage, following a fall in the average field rate.

The rates of phosphate and potash use on grassland decreased in Scotland by 8 and 11 kg/ha, down to a rate of 23 kg/ha for both, which (as for nitrogen) were the lowest recorded estimates since the beginning of the survey in Scotland. These decreases in overall rates of nitrogen, phosphate and potash on grassland were all related to changes in dressing cover, rather than average field rates.

B1.3.3 SULPHUR

The percentage of grassland dressed with fertiliser containing sulphur was very low, although this varied according to the purpose for which the grass is used (Table B1.14). Grassland which is cut intensively for silage is at greater risk of sulphur deficiency than grass that is taken for hay or predominantly used for grazing. The effect of sulphur deficiency on grassland used in silage production is usually to reduce yields in second and subsequent cuts, rather than first cut, unless the deficiency is very severe.

The differences in dressing cover between the three systems of management reflect these relative differences in the risk of sulphur deficiency, with around 6% to 8% of the grass cut for silage receiving sulphur and no more than 4% of the other two grass categories.

Table B1.14 Sulphur use on grassland, Great Britain 1993-1996

Dressing cover %

	grazed	*silage*	*hay*	*All grass*
1993	2	5	1	2
1994	4	8	2	4
1995	4	8	4	5
1996	3	6	1	3

Average application rate SO_3 (kg/ha)

	grazed	*silage*	*hay*	*All grass*
1993	34	39	20	35
1994	39	42	35	38
1995	33	35	40	34
1996	40	45	24	42

The average field rates of sulphur application in Table B1.14 exhibit wide variation, although recent data suggest that, with the exception of hay, rates are not closely linked to the immediate use of the crop. Applications to grass cut for silage and grazed grass appear to fluctuate annually from around 34 kg/ha to 42 kg/ha. This range is broadly comparable to the recommended rate of 40 kg/ha SO_3 for each silage cut considered to be at risk from sulphur deficiency. The risk of sulphur deficiency is greater in Scotland than elsewhere in Great Britain, because of lower rates of atmospheric sulphur deposition. The percentage dressing cover of fertilisers containing sulphur is accordingly approximately twice that of England and Wales.

B2. LONGER TERM TRENDS IN FERTILISER APPLICATION RATES

The British Survey of Fertiliser Practice was first conducted as an integrated British survey in 1992. Before that date the annual Survey of Fertiliser Practice was carried out separately, for England and Wales and for Scotland. Survey statistics from these earlier surveys have been collated in order to report an aggregated series for total nitrogen use for the twelve-year period, 1985 to 1996. Other series are presented for England and Wales dating from 1970, and for Scotland from 1983.

B2.1 Longer term trends for nitrogen

B2.1.1 NITROGEN USE IN GREAT BRITAIN

Figure B2.1 Overall use of total nitrogen, Great Britain 1985 -1996

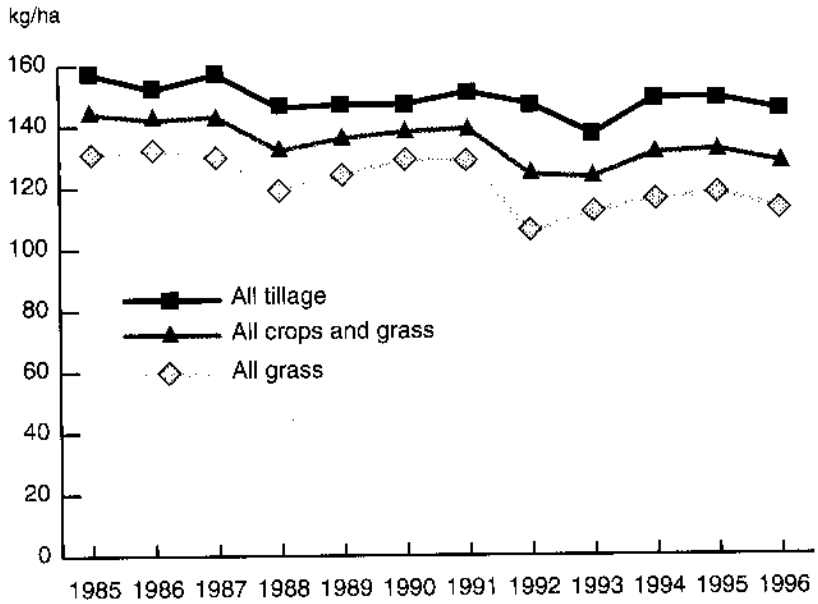


Table B2.1 Total overall nitrogen rates, Great Britain 1985-1996 (kg/ha)

	All tillage	*All grass*	*All crops and grass*
1985	157	131	144
1986	152	132	142
1987	157	130	143
1988	146	119	132
1989	147	124	136
1990	147	129	138
1991	151	129	139
1992	147	105	124
1993	137	112	123
1994	149	116	131
1995	149	118	132
1996	145	115	128

The overall application rates for total nitrogen in Great Britain shown in Figure B2.1 are taken from Table B2.1. The rate for all tillage shows a general decline over the period 1985 to 1996, from 157 to 145 kg/ha. The annual rates in this series can be characterised as four three-year time frames:

1985 to 1987 - rates as high as 157 kg/ha

1988 to 1990 - a sharp fall to lower rates, around 147 kg/ha

1991 to 1993 - partial recovery to 151 kg/ha, decline to 137 kg/ha

1994 to 1996 - another partial recovery to 149 kg/ha, then down to 145 kg/ha.

The long term trends for overall rates of total nitrogen on grass can be viewed within three time frames:

1985 to 1987 - stability at a high rate of about 131 kg/ha

1988 to 1991 - sharp fall to 119 kg/ha, with recovery to 129 kg/ha

1992 to 1995 - sharp fall to 105 kg/ha, with recovery to 118 kg/ha.

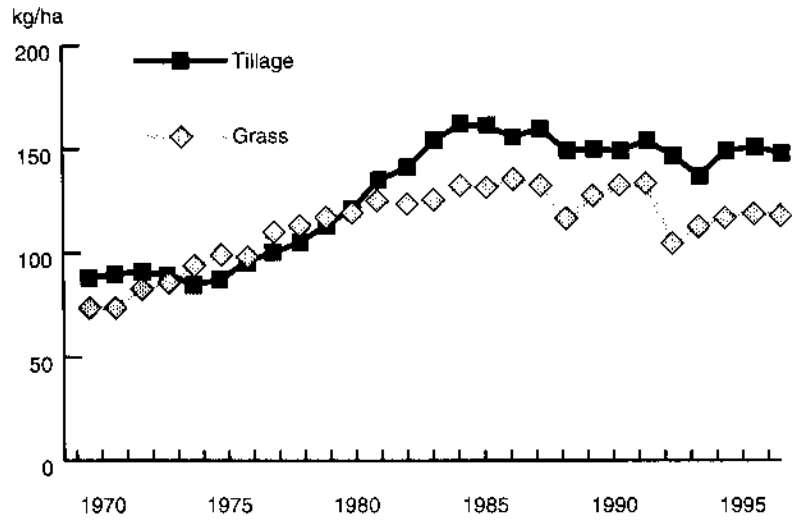
It is too soon to know how to regard the lower rate of 115 kg/ha in 1996.

The series for the overall application rate of total nitrogen on tillage and grass is, therefore, an aggregation of two separate rates which would seem to have moved differently. However, it is clear that the overall rates of total nitrogen recently observed, although higher than in the 1991 - 1992 period, are well below the rates recorded in the mid-1980s. The rate during the 1994 and 1995 seasons was about 132 kg/ha, up on the low rates of 124 kg/ha in 1992 and 1993, but below the 143 kg/ha observed in 1985 - 1987. In the 1996 growing season, the rate fell to 128 kg/ha.

B2.1.2 NITROGEN USE IN ENGLAND AND WALES

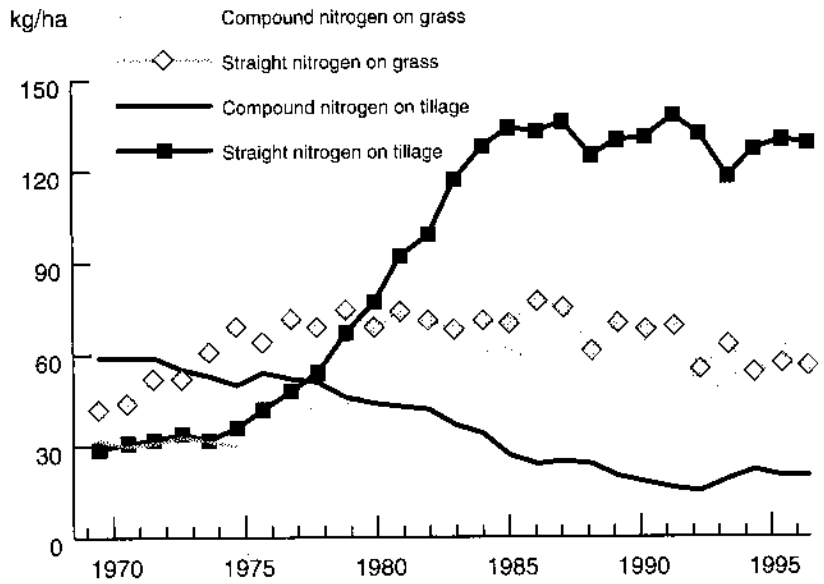
The earlier surveys for England and Wales, which accounts for around 83% (8.9 Mha) of the agricultural land in Britain, provide a longer time series. With this perspective it is clear that overall rates of application have risen steadily over the previous ten to fifteen years before reaching a plateau of higher application rates from 1984 to 1987 (Figure B2.2). The steeper rise in nitrogen rate on tillage crops than on grassland for the period from 1975 could be attributed, in part, to improvements in the breeding and yield potential of cereal cultivars. The period since the 1988 growing season has been one of net decline, characterised, more markedly in grassland farming, by a repeated pattern of sharp decline and partial recovery.

Figure B2.2 Nitrogen use in England and Wales 1970-1996



Most of the total nitrogen application to tillage crops in England and Wales is in straight form, where change in the rate of straight nitrogen use on tillage crops largely explains that of total nitrogen rates since 1970 (Figures B2.2 and B2.3). There were appreciable annual increases in the overall application rate of straight nitrogen on tillage from the mid-1970s until the mid-1980s, from 36 kg/ha to 134 kg/ha. There were then falls in 1988 and 1993, each followed by sustained recovery, although with a small net decline over the last ten years. The rate of compound nitrogen use on tillage crops, on the other hand, has been in long term decline from 1970 until 1992, with indications of a slight upturn since then.

Figure B2.3 Overall use of straight and compound nitrogen, England and Wales 1970-1996

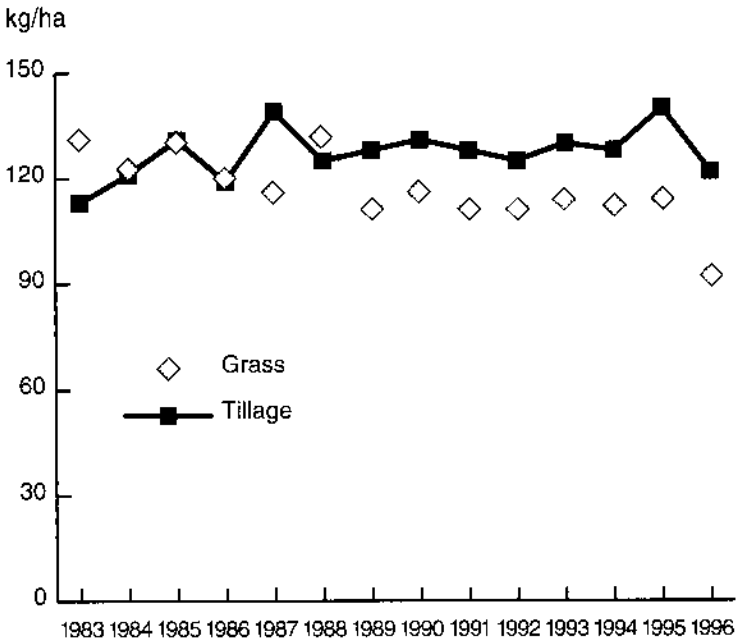


On grassland, in contrast, the long term trend in the straight nitrogen application rate in England and Wales has been one of gradual increase in the 1970s, slow decline and recovery in the early 1980s, and thereafter, one of net decline to the present, with notable falls in the 1988 and 1992 seasons (Figure B2.3). The overall rate of compound nitrogen also rose from the mid 1970s until the mid 1980s, then slowly declining before rising to an all time high in 1990. The rate fell dramatically in 1992, but recovered in 1994. Since then use of compound nitrogen products on grassland in England and Wales has been greater than use of straight nitrogen.

B2.1.3 NITROGEN USE IN SCOTLAND

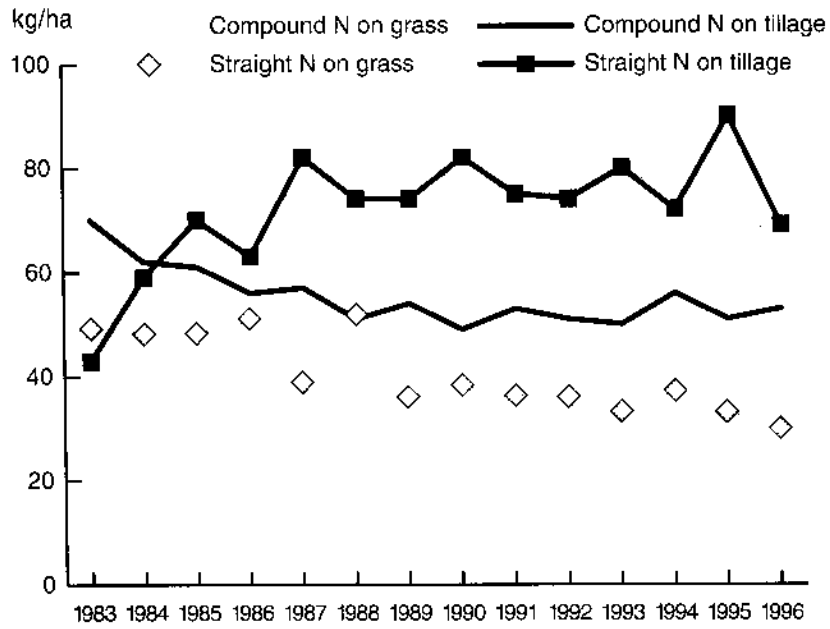
The series of total nitrogen application rates recorded for Scotland started in 1983, when the survey was first carried out (Figure B2.4). The trends differ from those for England and Wales: the annual rates of total nitrogen on both tillage and grassland show larger annual fluctuation during the first period from 1983 to 1987, fluctuating from 111 to 139 kg/ha, before remaining fairly stable until recently. In 1995 and 1996, annual rates have begun to fluctuate once again.

Figure B2.4 Overall use of total nitrogen in Scotland 1983-1996



In Scotland, overall rates of straight nitrogen on tillage crops, which have been about 40% lower than in England and Wales, also increased in the period from 1983 to 1987. Since then the rate has oscillated, slowly until 1994, and then more widely (Table B2.4). Before 1985, there was greater use of compound than straight nitrogen products. However, during the 1980s, the rate of compound nitrogen use on tillage crops declined. Since 1988 it has fluctuated, representing about 40% of total nitrogen use; the overall rate of compound product in Scotland is generally over twice that in England and Wales.

Figure B2.5 Overall use of straight and compound nitrogen, Scotland 1983-1996



About two thirds of the total nitrogen applied to grassland in Scotland is in compound, rather than straight, form. Moreover, there were sharp falls in use of straight nitrogen on grassland in 1987 and 1989, with a decline since then; the compound nitrogen rate for grassland shows little long term change relative to annual fluctuations, although it fell sharply in 1996.

B2.2 Longer term trends for phosphate and potash

B2.2.1 PHOSPHATE AND POTASH USE IN GREAT BRITAIN

Figure B2.6 Phosphate and potash use, Great Britain 1985-1996

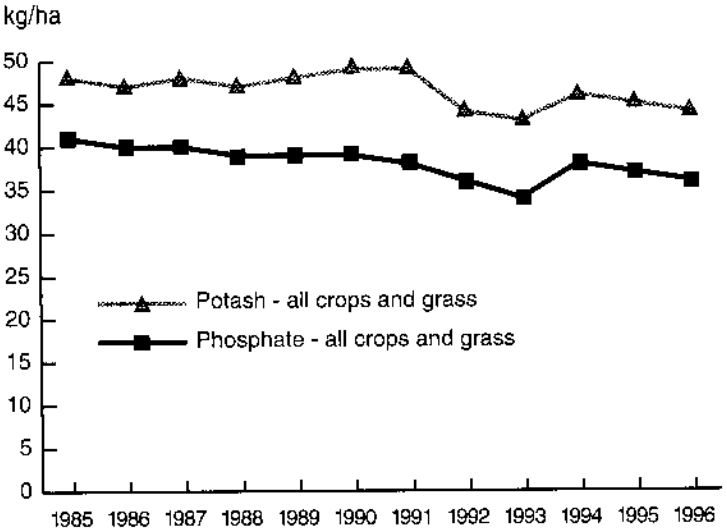


Table B2.2 Phosphate and potash application rates, Great Britain 1985-1996 (kg/ha)

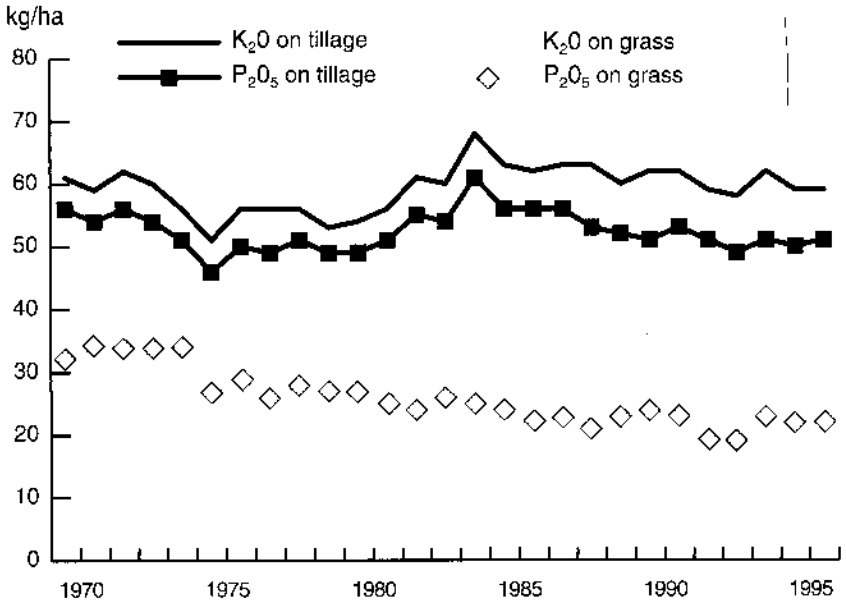
	All tillage		*All grass*		*All crops and grass*	
	phosphate	*potash*	*phosphate*	*potash*	*phosphate*	*potash*
1985	58	64	25	32	41	48
1986	57	62	23	33	40	47
1987	58	64	24	33	40	48
1988	56	63	23	31	39	47
1989	54	62	24	34	39	48
1990	53	64	25	36	39	49
1991	54	63	23	34	38	49
1992	53	61	21	28	36	44
1993	51	60	21	28	34	43
1994	53	63	24	31	38	46
1995	53	61	24	31	37	45
1996	52	61	23	30	36	44

The figures for overall phosphate application rates in Britain (Table B2.2) indicate a gradual decline over the past 11 years. Despite the small recovery in the 1994 growing season, rates in 1996 were approximately 10% below the 1985 estimates.

Potash rates in Great Britain remained stable from 1985 until 1990, but have since gradually declined by around 8% (Table B2.2). Small fluctuations in the potash rate over that period (Figure B2.6) follow similar patterns to those seen for nitrogen (Figure B2.1).

B2.2.2 PHOSPHATE AND POTASH USE IN ENGLAND AND WALES

Figure B2.7 Overall use of phosphate and potash in England and Wales 1970-1996

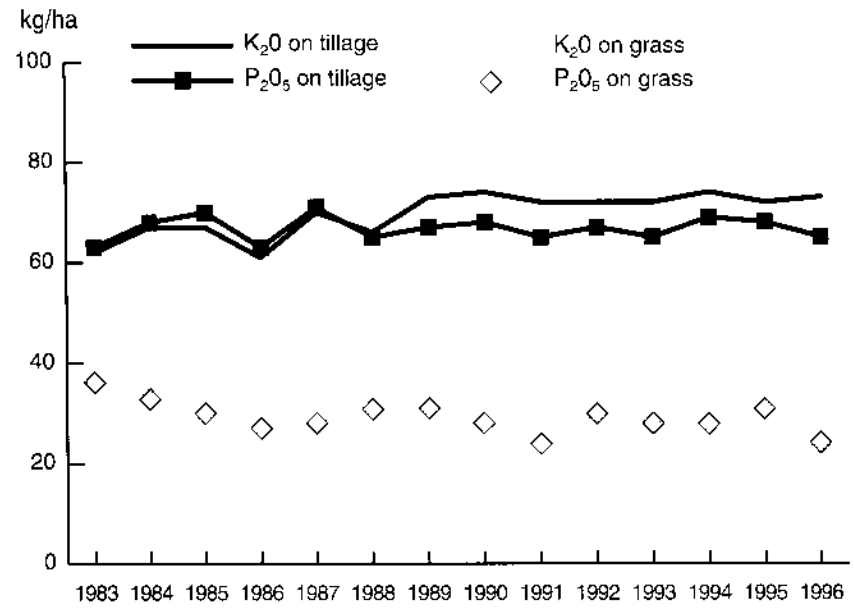


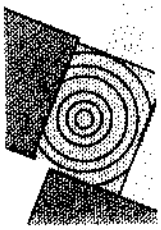
Phosphate and potash rates on tillage crops show a very similar pattern of annual fluctuations and have only marginally declined over the last 25 years. The phosphate application rate on grass was 32 kg/ha in 1970; it then gradually declined but since the mid 1980s has stabilised at around 22 kg/ha. Potash rates on grass increased consistently to a peak in 1990, but are now marginally (5 kg/ha) above their 1970 level (Figure B2.7). Compared with the early 1970s, overall rates on tillage crops during the last ten years suggest no net change in potash use, but a slight long term decrease in phosphate use. Annual potash use on grassland, although variable, has tended to increase slightly since 1970, whereas phosphate use has gradually declined.

B2.2.3 PHOSPHATE AND POTASH USE IN SCOTLAND

Overall rates of phosphate and potash have been relatively stable since 1983, apart from the large drop in application rates of both nutrients for grassland in 1996 (Figure B2.8). It may be noted that, in Scotland, application rates for both nutrients on both crops and tillage tend to be higher than those shown for England and Wales (Figure B2.7).

Figure B2.8 Overall use of phosphate and potash, Scotland 1983-1996





SECTION C SURVEY METHODOLOGY AND SAMPLING VARIATION

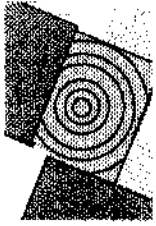
The British Survey of Fertiliser Practice has a nationally representative sampling design resulting in high precision estimates. Although 'random' sampling is involved, the design used leads to estimates that are more precise than those which would have been obtained by a 'simple random sampling' of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

Table C1 Sampling characteristics for the year 1996, Great Britain.

	farm holdings in population in 1995	total crops & grass in 1995	notional sampling fraction	target sample size	achieved sample size	achieved sample fraction
		column				
ENGLAND & WALES		%	%	ha	ha	%
Livestock						
(MAFF 'robust' types 4 - 7)						
crops & grass area 20-50 *ha*	25626	9.7	0.42	107	104	0.41
51-100 *ha*	18354	14.7	0.94	173	171	0.93
101-200 *ha*	8217	12.6	1.80	148	145	1.76
200+ *ha*	2674	12.0	4.86	130	123	4.60
Crops & mixed						
(MAFF robust types 1,2,8)						
crops & grass area 20-50 ha	10738	4.2	0.43	46	43	0.40
51-100 ha	10797	8.9	0.99	107	105	0.97
101-200 ha	9185	14.7	1.91	175	159	1.73
200+ ha	5591	22.7	4.81	269	243	4.35
Horticulture						
(MAFF robust type 3)						
crops & grass area 20-50 ha	569	0.2	1.41	8	8	1.41
51-100 ha	177	0.1	3.39	6	5	2.82
101-200 ha	77	0.1	9.09	7	5	6.49
200+ ha	29	0.1	17.24	5	4	13.79
Total for England and Wales	**92034**	**100%**		**1181**	**1115**	

NB Farm holdings predominantly engaged in horticulture were deliberately oversampled in order to provide sufficient precision in estimation of fertiliser dressings on such crops.

SCOTLAND						
Cereal/gen. cropping/hort.						
(SOAFD 'robust' groups 1-3))						
crops & grass area 20-50 ha	1091	2.5	0.55	6	6	0.55
51-100 ha	1370	6.8	1.17	16	16	1.17
101-200 ha	1266	11.9	2.37	30	28	2.21
200+ ha	555	11.5	5.23	29	28	5.05
Livestock & mixed						
(SOAFD 'robust' groups 4-8)						
crops & grass area 20-50 ha	4026	9.2	0.55	22	22	0.55
51-100 ha	4177	20.2	1.20	50	44	1.05
101-200 ha	2542	23.3	2.28	58	56	2.20
200+ ha	742	14.5	4.72	35	34	4.58
Total for Scotland	**15769**	**100%**		**246**	**234**	



As in past years, farms with less than 20 hectares of crops and grass were excluded from the survey because they are excluded from the agricultural census which acts as a sampling frame. The farms included in the census are stratified according to four size groups and five farm types (three for England and Wales and two for Scotland), in order, thereby, to reflect the variability in fertiliser practice across Britain. This produced twelve stratification cells for England and Wales and eight stratification cells for Scotland.

The fraction of farm holdings sampled from within each cell was proportioned to the total area of crops and grass. In many respects the survey only samples farms in order to survey farmed area. A 'variable fraction stratification' scheme is set out in Table C1. 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 SOAEFD. This resulted in a target sample of 1427, of which 1349 farms were successfully surveyed, an achieved 'sampling fraction' of 1.2% of farms (Table C2).

Table C2 Summary sampling characteristics 1996

	farm holdings in population 1995	total crops & grass in 1995 (million ha)	target sample size (ha)	achieved sample size (ha)	achieved sampling fraction (%)
England & Wales	95672	8.7	1181	1115	1.2
Scotland	15769	1.8	246	234	1.5
Great Britain	111441	10.5	1427	1349	1.2

Note that the farms were stratified according to information collected in the 1995 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 1427 farms in the target sample for the 1996 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 1349 farms: 1140 of these responses were from the 'main' sample and 209 responses were from a 'reserve' sample. The reserve sample was constructed by selecting, within each stratification cell, the farm having the next (adjacent) 'county-parish-holding number' to each member of the main sample, enhancing the extent of similarity and exchangeability. The use of a reserve sample, adopted in previous surveys, is a strategy designed to counter the threat of bias from the non-response to the main sample; any over-sampling created thereby is discounted subsequently through the use of sampling weights. The use of a reserve sample also means that there can be no one simple 'response rate', although the net response rate (excluding the farms discovered to be invalid) to the main sample, was 82% in 1996, and is the most appropriate for comparison with previous years and with other surveys.

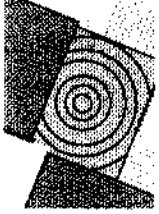


Table C3 Response to main and reserve samples

				1995	1996
				%	%
issued from Main Sample	**1427**				
response to Main Sample	**1140**		crude response rate	82.0	**79.9**
non-response	**287**	of which 30 invalid	net response rate	83.7	**81.7**
issued from Reserve Sample	**284**				
response to Reserve Sample	**209**	crude response rate		64.3	**73.6**
non-response	**75**	of which 9 invalid	net response rate	66.5	**75.7**
achieved sample size	**1349**		achieved rate	93.9	**94.5**

Table C4 Analysis of non response 1992 - 1996

		1992	1993	1994	1995	1996
a)	**net response rate**	%	%	%	%	%
	main sample	87	86	81	84	**81**
	reserve sample	89	85	71	67	**75**
	'overall' achieved rate (inc. 1994 'boost')	88	86	80	81	**80**
b)	**refusal rate**	9.6	11.3	16.5	14.1	**16.3**
	main reasons for refusal	%	%	%	%	%
	too busy	31.3	34.2	38.1	28.5	**42.0**
	not interested	22.1	11.2	21.1	29.7	**21.5**
	don't do surveys	14.1	9.2	9.2	15.2	**6.0**
	want payment	12.3	4.6	4.6	4.5	**3.4**
	too much paperwork (IACS)	–	19.9	6.8	5.8	**14.0**
c)	**non-contact rate**	2.5	2.6	4.0	3.9	**7.9**

SAMPLING VARIATION

Statistics calculated from survey data are only estimates subject to a degree of sampling variation. Ideally, estimates from a survey would be both unbiased and reliable. Cross-checks with sources outside the survey and rigorous attention to survey practice help ensure a lack of bias. Reliability is easier to assess. By 'reliable' is meant that the results obtained from the sample of farms are very similar to the results that would have been obtained had the sampling scheme provided a different set of farms to survey - a notion that justifies all random sampling. An indication of the reliability of a survey estimate is given by its 'standard error'. A selected number of standard errors is set out in Table C5.

Table C5 Standard errors for application rates for the major crops in 1996

GREAT BRITAIN

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	**total N**	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	
Winter wheat	0.7	0.8	0.9	0.8	0.3	0.8	0.3	1.5	0.3	0.4	2948
Oilseed rape	0.2	1.1	1.2	1.2	0.7	0.9	0.7	1.7	0.7	0.8	673
Winter barley	1.5	1.5	0.5	0.8	0.6	1.2	0.9	1.4	0.7	0.6	1161
Spring barley	0.8	1.4	0.6	0.6	0.4	0.7	1.0	0.4	0.5	0.3	940
M C potatoes	1.7	3.6	5.2	1.4	4.4	1.3	10.1	3.3	1.8	1.1	233
Sugar beet	1.7	0.6	2.0	0.6	4.9	2.2	2.0	5.2	2.3	5.9	339
All tillage crops	0.7	0.6	0.2	0.3	0.4	0.8	0.5	0.2	0.1	0.4	7768
All grass	1.1	0.8	0.9	0.3	0.4	0.8	1.7	0.3	0.2	0.3	5599

ENGLAND & WALES

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	**total N**	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	
Winter wheat	0.8	0.7	0.8	0.7	0.3	0.9	0.3	1.7	0.3	0.5	2774
Oilseed rape	0.4	1.4	1.6	1.5	0.3	0.9	0.9	2.8	0.9	0.4	596
Winter barley	1.7	2.0	0.4	0.7	0.8	1.6	1.2	1.8	0.8	0.6	1036
Spring barley	2.2	2.8	0.6	1.1	0.7	1.9	1.1	0.7	0.7	0.5	444
M C potatoes	0.5	5.8	6.3	1.2	5.1	3.0	10.1	4.1	1.8	1.1	187
Sugar beet	1.7	0.5	1.9	0.6	4.9	2.2	2.0	5.2	2.3	5.9	337
All tillage crops	1.1	1.0	0.1	0.4	0.4	1.1	0.7	0.2	0.1	0.6	6667
All grass	1.8	1.3	1.7	0.3	0.6	1.1	2.0	1.4	0.2	0.6	4028

SCOTLAND

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	**total N**	**str't N**	**comp N**	**total P_2O_5**	**total K_2O**	
Winter wheat	1.8	2.4	1.7	0.7	1.4	1.8	1.6	1.3	0.8	0.3	174
Oilseed rape	2.0	1.7	1.0	0.9	3.3	1.1	1.5	1.5	0.6	3.1	77
Winter barley	2.4	4.4	2.3	1.9	1.6	3.0	3.1	1.4	0.9	0.8	125
Spring barley	0.4	0.8	0.8	0.3	0.2	0.3	1.2	0.5	0.4	0.3	496
M C potatoes	2.7	.	2.7	1.7	1.5	1.2	.	1.2	2.9	1.7	46
All tillage crops	0.6	0.4	0.3	0.2	0.4	0.2	0.4	0.1	0.2	0.1	1101
All grass	1.1	1.9	2.2	0.4	0.5	0.6	1.1	3.1	0.5	0.5	2672

The size of the 'standard error' is influenced by several factors, some of which vary across years. Changes in sample design have been kept to a minimum, but changes in the variability of application rates across farms in Britain, and therefore in the sample, may have had 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.

A reliable estimate is one which is large relative to its standard error; standard errors which are relatively large show up poorly determined survey estimates. This is particularly 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 size of standard errors for the application rates in the survey actually depends 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 1996, in Great Britain, the estimated overall application rate of total nitrogen use on winter wheat was 185 kg/ha. This is large relative to the value of the corresponding standard error of 0.7 kg/ha, indicating very high reliability (good precision), a 'relative error' near to 0.38% (the ratio of 0.7 to 185, as percentage). The application of nitrogen on sugar beet provides another example with good precision: the estimated overall application rate was 107 kg/ha, with a corresponding standard error of 1.7 kg/ha, a 'relative error' of 1.6%. The application of nitrogen on vegetables (brassicae) is estimated with much less precision: 201 kg/ha with a corresponding standard error of 14.4 kg/ha, resulting in a much larger 'relative error' of 7.2% due, in part, to the small number (82) of fields of brassicae 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 nitrogen would have a narrower Confidence Interval: with a lower bound of 183.6 (185 - 2 x 0.7) and an upper bound of 186.4 (185 + 2 x 0.7). 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 nitrogen 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 observed change in a given dressing-crop application rate between two years. 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 three or more times the size of the standard error of one year's estimate.

For example, the overall application rate of potash on maincrop potatoes in Britain, in 1996, was estimated at 248 kg/ha, an apparent decrease from 255 kg/ha in 1995. The difference is 7 kg/ha. The standard error in 1996 was 4.4 kg/ha. The observed difference of 7 kg/ha is not greater than 3 times 4.4 (= 13.2) kg/ha and may therefore be attributable to sampling variation alone.

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 rule of thumb for statistical significance of such differences is equivalent to twice the standard error of the difference. The approximation used above, only taking note of differences greater than three times standard error (of a point estimate), assumes that the standard

error of each estimate was the same. Inevitably there will be some variation in the standard error estimate each year, even if the sampling design has remained the same. For example, in 1995 the standard error for phosphate on oilseed rape, in England and Wales, was reported as 0.3, providing a standard error for the between year difference of 1.53 (square root of 0.32+1.52): the observed difference of 2 kg/ha, between 1995 and 1996, is not greater than twice this standard error of the difference (3.06).

ESTIMATING THE STANDARD ERROR

The procedure required to obtain correct standard errors for a complex survey design is not straightforward. The 'classical' approach to estimating standard errors from such a complex survey design is to use complex formulae, appropriate to each statistic of interest, from the standard texts. With sufficient farms and fields in the sample, statistical theory provides methods to assess the reliability of estimates using the variability in the sample and knowledge of the sampling scheme used - the explicit stratification and clustering described above. This approach, in part developed at Rothamsted Experimental Station[9], and used for earlier (pre-1992) surveys, has an advantage in terms of precision of standard error estimation, but it may be regarded as having unwanted bias, in that it fails to measure the gain in precision (reliability) obtained from the implicit stratification in the systematic selection. It also fails to measure sources of non-sampling variation. Moreover, it is computationally complex and difficult to extend to a wide variety of estimators.

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

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

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

SECTION D - TABLES

CONTENTS

The numbering of these tables corresponds to the numbering used in the 1992 - 1995 BSFP Reports.

GREAT BRITAIN TABLES 1996

ENGLAND AND WALES TABLES 1996

SCOTLAND TABLES 1996

Note: Row percentages may not sum exactly to 100 due to rounding.

Table GB1.1 Total fertiliser use, Great Britain 1996

	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	100	53	54	28	154	42	49	154	22	27	39
Winter wheat	98	75	71	11	188	68	74	185	51	53	2948
Spring barley	97	89	90	29	96	53	62	94	47	56	940
Winter barley	98	82	82	18	143	64	73	140	52	60	1161
Oats	96	76	76	18	116	65	74	111	50	56	165
Rye	100	67	69	10	129	43	61	129	29	42	27
Early potatoes	97	90	90	28	162	195	227	157	175	204	62
Maincrop potatoes	95	94	96	33	180	190	259	171	178	248	233
Sugar beet	96	60	75	33	112	67	129	107	40	96	339
Oilseed rape	96	79	74	11	197	65	67	188	52	49	673
Linseed	73	31	32	11	70	58	82	51	18	26	101
Forage maize	70	64	51	89	75	72	85	52	46	43	156
Turnips (stock)	94	94	93	47	72	96	87	68	90	81	78
Kale and cow cabbage	99	93	89	66	98	51	50	97	48	44	40
Other roots/green crops	93	91	90	46	102	93	104	95	84	94	56
Peas	10	48	50	10	23	61	71	2	29	36	213
Beans	8	51	44	6	90	65	68	7	33	30	195
Vegetables (brassicae)	93	87	88	13	217	79	197	201	69	173	82
Vegetables (other)	80	75	78	9	117	91	124	94	68	97	68
Small fruit	81	52	78	37	95	85	97	77	44	75	28
Top fruit	76	49	45	.	65	36	50	50	17	23	99
Other tillage	46	40	41	27	112	56	70	51	23	28	65
All tillage	92	75	74	18	158	69	82	145	52	61	7768
Grass under 5 years	96	75	78	47	173	44	66	165	33	51	1572
Grass 5 years and over	84	66	65	47	122	31	39	103	21	25	4027
All grass	86	68	67	47	133	34	45	115	23	30	5599
All crops & grass	89	71	70	34	145	51	63	128	36	44	13367

Source: British Survey of Fertiliser Practice 1996

Table GB1.2 Use of straight fertiliser, Great Britain 1996

	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	77	.	.	148	.	.	115	.	.	39
Winter wheat	97	6	4	179	74	93	174	5	4	2948
Spring barley	54	1	3	77	117	102	41	1	3	940
Winter barley	91	4	5	137	86	77	125	4	4	1161
Oats	77	4	3	119	105	141	92	4	4	165
Rye	82	4	8	127	29	37	103	1	3	27
Early potatoes	18	.	3	70	.	134	12	.	4	62
Maincrop potatoes	23	2	10	111	207	189	25	3	19	233
Sugar beet	84	.	12	100	159	147	84	1	17	339
Oilseed rape	92	7	3	183	67	88	168	5	3	673
Linseed	62	.	.	69	.	75	43	.	.	101
Forage maize	30	12	17	91	77	97	27	9	17	156
Turnips (stock)	10	.	.	71	58	75	7	.	.	78
Kale and cow cabbage	26	4	.	95	173	.	25	7	.	40
Other roots/green crops	19	.	5	122	.	150	23	.	7	56
Peas	2	2	6	45	71	86	1	2	5	213
Beans	.	8	2	60	70	75	.	5	1	195
Vegetables (brassicae)	56	.	1	135	.	150	75	.	2	82
Vegetables (other)	63	.	2	74	.	183	46	.	4	68
Small fruit	49	1	45	81	57	55	40	1	25	28
Top fruit	48	8	7	74	61	111	35	5	8	99
Other tillage	30	3	2	100	70	225	30	2	4	65
All tillage	78	5	5	154	78	103	121	4	5	7768
Grass under 5 years	58	2	4	143	88	100	83	2	4	1572
Grass 5 years and over	39	1	1	118	85	82	46	1	1	4027
All grass	42	1	1	124	86	92	53	1	1	5599
All crops & grass	59	3	3	143	80	100	84	2	3	13367

Source: British Survey of Fertiliser Practice 1996

Table GB1.3 Use of compound fertiliser, Great Britain 1996

	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	48	53	54	82	42	49	39	22	27	39
Winter wheat	23	69	67	48	67	72	11	46	49	2948
Spring barley	78	88	89	67	53	60	52	47	54	940
Winter barley	31	77	78	51	63	73	16	49	56	1161
Oats	37	73	73	53	63	71	19	46	52	165
Rye	55	63	67	46	44	58	26	28	39	27
Early potatoes	86	90	90	169	195	222	145	175	199	62
Maincrop potatoes	90	93	93	162	189	247	146	175	229	233
Sugar beet	32	59	66	74	67	120	23	40	79	339
Oilseed rape	40	73	70	50	65	65	20	47	46	673
Linseed	13	31	32	60	58	82	8	18	26	101
Forage maize	52	55	36	49	66	72	25	36	26	156
Turnips (stock)	89	94	92	68	96	87	61	90	80	78
Kale and cow cabbage	90	93	89	80	43	50	72	41	44	40
Other roots/green crops	83	91	88	86	93	98	72	84	87	56
Peas	8	46	45	19	60	67	2	28	30	213
Beans	7	43	42	91	64	68	7	28	29	195
Vegetables (brassicae)	88	87	88	143	79	195	126	69	171	82
Vegetables (other)	54	75	76	88	91	123	48	68	93	68
Small fruit	32	51	51	116	86	99	37	44	50	28
Top fruit	34	43	40	41	28	37	14	12	14	99
Other tillage	29	39	39	73	54	63	21	21	24	65
All tillage	36	71	70	66	69	80	24	49	56	7768
Grass under 5 years	71	73	75	115	43	64	81	31	48	1572
Grass 5 years and over	64	66	64	89	30	39	57	20	25	4027
All grass	66	67	66	94	32	44	62	22	29	5599
All crops & grass	52	69	68	85	50	61	45	34	42	13367

Source: British Survey of Fertiliser Practice 1996

Table GB1.4 Use of lime, Great Britain 1996

	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	2.5	3.8	.	3.6	.	9.9	2.5		2.5	.	6.2	.	3.8	39
Winter wheat	5.5	1.3	1.6	0.3	0.6	9.5	2.6		2.6	2.6	4.7	3.1	2.7	2948
Spring barley	8.7	0.1	7.1	.	0.7	16.7	2.1		3.7	2.2	3.7	4.1	2.2	940
Winter barley	7.3	2.4	3.6	0.3	1.0	14.6	2.1		3.1	4.7	5.3	2.9	3.0	1161
Oats	2.0	2.0	1.3	.	0.3	5.6	2.5		2.7	2.6	.	2.5	2.6	165
Rye	.	1.4	.	.	4.8	6.2	.		2.5	.	.	0.4	0.8	27
Early potatoes	.	0.7	0.6	.	.	6.3	.		3.7	3.4	.	.	0.7	62
Maincrop potatoes	5.2	0.3	0.2	.	.	5.6	2.6		1.3	2.7	.	.	2.5	233
Sugar beet	10.6	5.3	5.2	2.6	0.3	23.9	2.3		2.0	2.0	5.1	12.4	2.6	339
Oilseed rape	7.2	4.9	1.9	0.8	1.0	16.2	2.3		2.2	2.1	2.9	3.6	2.3	673
Linseed	3.4	0.9	.	0.5	0.3	5.1	2.0		3.0	.	6.2	2.5	2.6	101
Forage maize	9.8	1.6	0.1	.	0.6	12.2	2.3		2.7	2.6	.	0.4	2.2	156
Turnips (stock)	4.4	.	2.1	.	.	6.5	1.5		.	2.9	.	.	2.0	78
Kale and cow cabbage	7.4	.	39.9	.	.	47.3	2.7		.	2.8	.	.	2.8	40
Other roots/green crops	2.9	.	9.4	.	9.4	21.7	2.1		.	1.9	.	2.1	2.0	56
Peas	2.4	8.9	2.4	0.2	.	14	2.5		1.8	0.8	6.2	.	1.8	213
Beans	5.0	0.7	0.7	.	0.1	6.5	2.3		2.1	2.7	.	2.5	2.3	195
Vegetables (brassicae)	3.8	3.2	4.6	.	.	11.6	2.8		3.3	3.5	.	.	3.2	82
Vegetables (other)	3.4	2.6	1.3	2.5	1.7	11.5	2.2		3.3	2.1	1.2	3.7	2.5	68
Small fruit	.	.	.	.	.	.	.		.	.	.	.	.	28
Top fruit	0.4	2.6	2.5	.	0.5	6.0	2.5		1.4	1.9	.	1.3	1.7	99
Other tillage	2.3	.	1.8	.	0.3	4.4	2.5		.	2.1	.	0.6	2.2	65
All tillage	6.3	2.0	2.8	0.4	0.7	12.3	2.4		2.5	2.8	4.5	3.2	2.6	7768
Grass under 5 years	8.7	0.4	2.1	.	1.1	12.5	2.2		1.4	2.8	.	2.5	2.3	1572
Grass 5 years & over	2.4	0.4	2.0	.	0.2	5.0	2.2		2.7	2.7	2.5	2.9	2.5	4027
All grass	3.6	0.4	2.0	.	0.4	6.4	2.2		2.4	2.7	2.5	2.7	2.4	5599
All crops & grass	4.8	1.1	2.4	0.2	0.5	9.1	2.3		2.5	2.8	4.5	3.0	2.5	13367

Source: British Survey of Fertiliser Practice 1996

Table GB3.0 Product and nutrient use by month of application, Great Britain 1996

(a) Product Use

	row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total product ('000 tonnes)
Straight N		0	5	30	40	14	5	3	2	1	0	0	0	2167
Straight P		0	12	10	21	4	4	3	12	13	15	5	0	52
Straight K		2	15	14	10	6	3	4	2	14	18	7	5	56
Compounds		1	4	22	24	12	9	4	4	8	9	2	0	2440
Unknown		8	6	21	15	2	5	2	1	6	17	9	8	58
All fertilisers		1	5	26	31	12	7	3	3	5	5	2	0	4772

(b) Nutrient Use

	row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total nutrient ('000 tonnes)
N		0	5	28	37	14	8	4	3	1	1	0	0	1120
P_2O_5		1	5	20	20	8	3	2	4	14	17	5	1	319
K_2O		1	6	19	18	9	7	3	4	12	14	4	1	389
Total		1	5	25	30	12	7	3	3	6	6	2	0	1828

Note: '*product use*' refers to total tonnage of the products used by farmers in the survey year 1996
'*nutrient use*' refers to the tonnage of each nutrient contained in the products used (eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P2O5 and 10kg of K_2O;
100kg of ammonium nitrate, one of the the 'straight N' products contains, typically, 34.5 kg of N)

Source: British Survey of Fertiliser Practice 1996

Table EW1.1 Total fertiliser use, England and Wales 1996

	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	100	53	54	28	154	42	49	154	22	27	39
Winter wheat	98	74	70	11	188	67	73	185	49	51	2774
Spring barley	95	77	81	20	100	48	62	95	37	50	444
Winter barley	98	81	82	18	141	63	73	138	51	59	1036
Oats	99	75	73	13	126	69	79	125	51	58	131
Rye	100	63	65	.	126	49	70	126	31	45	26
Early potatoes	96	88	88	25	166	202	235	160	178	207	51
Maincrop potatoes	94	93	95	39	189	196	269	178	183	256	187
Sugar beet	96	60	75	33	112	67	129	107	40	96	337
Oilseed rape	95	77	70	11	200	66	65	190	51	46	596
Linseed	75	31	32	9	71	56	80	53	17	26	96
Forage maize	70	64	51	89	75	72	85	52	46	43	156
Turnips (stock)	88	85	85	40	65	52	70	57	44	59	23
Kale and cow cabbage	97	86	86	58	96	65	53	93	56	45	27
Other roots/green crops	91	87	87	59	88	90	121	80	79	106	33
Peas	10	50	52	10	24	61	71	2	30	37	202
Beans	8	51	44	6	90	65	68	7	33	30	194
Vegetables (brassicae)	92	87	87	10	218	80	201	201	69	176	79
Vegetables (other)	80	74	78	10	119	90	126	96	67	98	65
Small fruit	82	53	78	37	95	85	97	78	45	76	27
Top fruit	76	49	45	.	65	36	50	50	17	23	99
Other tillage	60	51	51	38	106	54	71	63	28	36	45
All tillage	91	73	71	17	163	69	83	148	51	59	6667
Grass under 5 years	96	72	76	52	185	45	73	177	32	56	1049
Grass 5 years and over	85	65	64	51	125	31	41	106	20	26	2979
All grass	87	66	66	51	136	33	47	118	22	31	4028
All crops & grass	89	69	68	35	149	52	65	133	36	45	10695

Source: British Survey of Fertiliser Practice 1996

Table EW1.2 Use of straight fertiliser, England & Wales 1996

	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	77	-	-	148	-	-	115	-	-	39
Winter wheat	97	6	4	180	76	91	174	5	4	2774
Spring barley	60	1	5	92	113	111	55	1	5	444
Winter barley	92	4	5	134	90	80	124	4	4	1036
Oats	92	5	4	120	105	141	110	5	5	131
Rye	80	4	8	126	29	37	100	1	3	26
Early potatoes	17	-	4	52	-	134	9	-	5	51
Maincrop potatoes	28	2	11	111	207	194	31	4	21	187
Sugar beet	84	-	12	100	159	147	84	1	17	337
Oilseed rape	93	7	3	187	71	84	174	5	3	596
Linseed	65	-	-	69	-	75	45	-	-	96
Forage maize	30	12	17	91	77	97	27	9	17	156
Turnips (stock)	16	1	1	78	58	75	12	-	-	23
Kale and cow cabbage	29	9	-	92	173	-	26	15	-	27
Other roots/green crops	25	-	3	90	-	150	22	-	5	33
Peas	2	2	6	45	71	87	1	2	6	202
Beans	-	8	2	60	70	75	-	5	1	194
Vegetables (brassicae)	54	-	2	136	-	150	73	-	2	79
Vegetables (other)	64	-	2	74	-	183	47	-	4	65
Small fruit	50	1	45	81	57	55	40	1	25	27
Top fruit	48	8	7	74	61	111	35	5	8	99
Other tillage	38	3	3	114	48	225	43	1	6	45
All tillage	81	5	5	158	79	103	129	4	5	6667
Grass under 5 years	64	3	5	148	85	99	94	2	5	1049
Grass 5 years and over	42	1	1	120	90	80	50	1	1	2979
All grass	46	1	1	126	88	91	58	1	1	4028
All crops and grass	63	3	3	146	81	100	92	3	3	10695

Source: British Survey of Fertiliser Practice 1996

Table EW1.3 Use of compound fertiliser, England and Wales 1996

	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	48	53	54	82	42	49	39	22	27	39
Winter wheat	21	68	66	49	66	71	11	45	47	2774
Spring barley	57	76	78	68	47	58	39	36	45	444
Winter barley	28	76	77	52	61	72	15	47	55	1036
Oats	27	70	70	53	65	75	15	46	53	131
Rye	50	59	63	51	50	66	26	30	42	26
Early potatoes	87	88	88	174	202	229	151	178	202	51
Maincrop potatoes	88	92	92	166	195	256	147	179	235	187
Sugar beet	32	59	66	74	66	120	23	39	79	337
Oilseed rape	34	70	67	49	65	64	17	46	43	596
Linseed	13	31	32	61	56	80	8	17	26	96
Forage maize	52	55	36	49	66	72	25	36	26	156
Turnips (stock)	72	84	84	62	52	70	45	44	59	23
Kale and cow cabbage	79	86	86	84	47	53	67	41	45	27
Other roots/green crops	73	87	84	79	90	120	58	79	101	33
Peas	8	47	47	20	60	67	2	28	31	202
Beans	7	44	43	91	64	68	7	28	29	194
Vegetables (brassicae)	87	87	87	146	80	198	128	69	174	79
Vegetables (other)	53	74	75	90	90	124	48	67	94	65
Small fruit	32	52	52	116	86	99	38	44	51	27
Top fruit	34	43	40	41	28	37	14	12	14	99
Other tillage	36	48	48	56	55	62	20	26	30	45
All tillage	30	68	67	67	68	81	20	46	54	6667
Grass under 5 years	67	69	72	124	44	70	83	30	51	1049
Grass 5 years and over	63	64	63	89	30	40	56	19	25	2979
All grass	63	65	65	95	32	46	60	21	30	4028
All crops & grass	47	66	66	87	50	63	41	33	41	10695

Source: British Survey of Fertiliser Practice 1996

Table EW1.4 Use of lime, England and Wales 1996

	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	2.5	3.8	.	3.6	.	9.9	2.5	2.5	.	6.2	.	3.8	39
Winter wheat	5.6	1.4	1.4	0.4	0.6	9.4	2.6	2.6	2.8	4.7	3.1	2.8	2774
Spring barley	4.3	0.3	2.0	0.1	1.5	8.1	2.5	3.7	2.8	3.7	4.1	2.9	444
Winter barley	7.2	2.6	2.6	0.3	1.0	13.8	2.1	3.1	5.6	5.3	3.2	3.1	1036
Oats	1.5	2.6	0.6	.	0.4	5.1	2.5	2.7	2.5	.	2.5	2.6	131
Rye	.	1.6	.	.	5.3	6.9	.	2.5	.	.	0.4	0.8	26
Early potatoes	.	0.8	.	.	.	6.7	.	3.7	.	.	.	0.5	51
Maincrop potatoes	6.0	0.3	0.2	.	.	6.5	2.7	1.3	2.7	.	.	2.6	187
Sugar beet	10.6	5.3	5.2	2.6	0.3	23.9	2.3	2.0	2.0	5.1	12.4	2.6	337
Oilseed rape	7.6	5.6	1.1	1.0	1.0	16.7	2.3	2.2	1.9	2.9	3.7	2.3	596
Linseed	3.5	1.0	.	0.5	0.3	5.3	2.0	3.0	.	6.2	2.5	2.6	96
Forage maize	9.8	1.6	0.1	.	0.6	12.2	2.3	2.7	2.6	.	0.4	2.2	156
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	.	.	23
Kale and cow cabbage	4.5	.	10.9	.	.	15.5	3.4	.	2.7	.	.	2.9	27
Other roots/green crops	3.5	.	.	.	17.6	21.1	1.9	.	.	.	2.1	2.1	33
Peas	2.5	9.3	1.4	0.2	.	13.6	2.5	1.8	0.5	6.2	.	1.9	202
Beans	5.1	0.7	0.7	.	0.1	6.6	2.3	2.1	2.7	.	2.5	2.3	194
Vegetables (brassicae)	3.9	3.3	4.7	.	.	12	2.8	3.3	3.5	.	.	3.2	79
Vegetables (other)	1.7	2.7	0.7	2.6	1.7	9.4	3.7	3.3	2.7	1.2	3.7	2.8	65
Small fruit	.	.	.	.	.	.	.	.	.	.	.	.	27
Top fruit	0.4	2.6	2.5	.	0.5	6.0	2.5	1.4	1.9	.	1.3	1.7	99
Other tillage	2.7	.	.	.	.	2.7	2.5	.	.	.	.	2.5	45
All tillage	6.0	2.3	1.7	0.5	0.7	11.3	2.4	2.5	3.3	4.5	3.3	2.7	6667
Grass under 5 years	10.4	0.6	1.7	.	1.5	14.2	2.3	1.4	2.8	.	2.6	2.3	1049
Grass 5 years & over	2.7	0.4	1.6	.	0.3	5.0	2.3	2.7	2.8	2.5	3.2	2.5	2979
All grass	4.0	0.5	1.6	.	0.5	6.6	2.3	2.4	2.8	2.5	2.9	2.4	4028
All crops & grass	4.9	1.4	1.7	0.2	0.6	8.8	2.4	2.5	3.0	4.5	3.1	2.6	10695

Source: British Survey of Fertiliser Practice 1996

Table EW1.5 Percentage of crop area by field application rate – N, England and Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	.	.	8	1	20	2	11	36	4	18	.	.	39
Winter wheat	2	.	1	2	3	4	7	39	36	4	2	1	2774
Spring barley	5	.	6	12	26	29	13	6	.	1	.	.	444
Winter barley	2	.	3	3	8	16	27	33	6	2	.	.	1036
Oats	1	.	3	4	16	19	38	14	.	4	.	1	131
Rye	.	.	.	2	41	23	14	11	.	10	.	.	26
Early potatoes	4	.	12	.	4	.	.	48	27	2	3	.	51
Maincrop potatoes	6	1	3	1	4	5	2	34	33	6	3	.	187
Sugar beet	4	.	12	9	17	18	27	8	2	1	2	.	337
Oilseed rape	5	.	1	3	3	2	8	24	36	15	2	.	596
Linseed	25	2	30	18	11	2	4	7	.	.	.	.	96
Forage maize	30	12	10	16	9	6	14	3	.	.	.	.	156
Turnips (stock)	12	6	14	36	28	4	.	.	.	.	.	.	23
Kale and cow cabbage	3	.	3	23	21	16	31	1	2	.	.	.	27
Other roots/green crops	9	.	5	36	17	11	14	8	.	.	.	.	33
Peas	90	7	3	.	.	.	.	.	.	.	.	.	202
Beans	92	2	2	1	.	.	1	2	.	.	.	.	194
Vegetables (brassicae)	8	.	1	8	3	2	14	7	22	29	.	5	79
Vegetables (other)	20	6	4	9	11	17	4	27	3	1	.	.	65
Small fruit	18	24	3	1	15	7	3	29	.	.	.	.	27
Top fruit	24	35	4	5	8	3	16	3	1	.	.	.	99
Other tillage	40	.	12	18	6	5	1	11	8	.	.	.	45
All tillage	9	1	3	4	7	8	12	28	22	4	1	.	6667
Grass under 5 yrs	4	.	5	9	8	9	13	13	14	12	11	2	1049
Grass 5 yrs and over	15	1	11	18	12	8	8	11	7	3	4	1	2979
All grass	13	1	9	16	12	8	9	11	8	4	5	2	4028
All crops & grass	11	1	7	11	9	8	10	20	15	4	3	1	10695

Source : British Survey of Fertiliser Practice 1996

Table EW1.6 Percentage of crop area by field application rate – P_2O_5, England and Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	fields in sample
Spring wheat	47	8	28	17	.	.	.	.	.	.	.	.	39
Winter wheat	26	3	11	34	20	4	1	.	.	.	.	.	2774
Spring barley	23	6	33	30	5	1	.	1	.	.	.	.	444
Winter barley	19	4	18	34	20	3	1	1	.	.	.	.	1036
Oats	25	4	13	31	20	1	.	5	.	.	.	.	131
Rye	37	.	41	13	6	3	.	.	.	.	.	.	26
Early potatoes	12	.	.	4	3	2	.	29	41	5	5	.	51
Maincrop potatoes	7	3	4	1	5	8	1	18	31	12	10	.	187
Sugar beet	40	9	20	13	7	4	2	2	2	.	.	.	337
Oilseed rape	23	4	11	37	20	3	1	1	.	.	.	.	596
Linseed	69	1	14	11	.	6	.	.	.	.	.	.	96
Forage maize	36	6	8	27	9	8	3	3	.	.	.	.	156
Turnips (stock)	15	2	45	20	10	6	2	.	.	.	.	.	23
Kale and cow cabbage	14	.	40	36	.	2	.	.	9	.	.	.	27
Other roots/green crops	13	.	15	3	48	9	.	11	.	.	.	.	33
Peas	50	2	12	28	5	2	.	.	1	.	.	.	202
Beans	49	2	9	25	11	3	1	.	.	.	.	.	194
Vegetables (brassicae)	13	8	12	34	8	11	7	3	.	4	.	.	79
Vegetables (other)	26	1	4	22	25	10	8	2	1	.	.	1	65
Small fruit	47	1	2	31	3	.	.	15	.	.	.	.	27
Top fruit	51	26	.	16	6	.	.	.	.	.	.	.	99
Other tillage	49	7	20	15	3	3	1	2	.	.	.	.	45
All tillage	27	4	14	30	17	4	1	1	1	.	.	.	6667
Grass under 5 years	28	17	27	19	6	2	1	.	.	.	.	.	1049
Grass 5 years and over	35	27	28	7	2	.	.	.	.	.	.	.	2979
All grass	34	25	28	9	2	1	.	.	.	.	.	.	4028
All crops & grass	31	15	21	19	9	2	1	1	1	.	.	.	10695

Source : British Survey of Fertiliser Practice 1996

Table EW1.7 Percentage of crop area by field application rate – K_2O, England & Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	46	4	25	23	3	.	.	.	.	.	.	.	39
Winter wheat	30	3	10	25	24	6	1	2	1	.	.	.	2774
Spring barley	19	2	25	30	17	5	1	1	.	.	.	.	444
Winter barley	18	2	14	25	29	7	2	1	.	.	.	.	1036
Oats	27	3	6	26	25	7	2	3	1	.	.	.	131
Rye	35	.	14	26	17	.	7	.	.	.	.	.	26
Early potatoes	12	.	.	2	.	.	1	27	27	12	15	5	51
Maincrop potatoes	5	.	6	.	1	2	2	9	8	22	40	6	187
Sugar beet	25	3	8	7	14	10	8	12	5	4	2	1	337
Oilseed rape	30	4	15	27	20	3	1	1	.	.	.	.	596
Linseed	68	1	7	13	5	1	.	6	.	.	.	.	96
Forage maize	49	3	5	11	19	5	1	6	1	.	.	.	156
Turnips (stock)	15	2	33	14	17	13	.	7	.	.	.	.	23
Kale and cow cabbage	14	.	33	41	7	6	.	.	.	.	.	.	27
Other roots/green crops	13	.	4	3	28	18	11	18	.	5	.	.	33
Peas	48	1	14	21	7	4	2	3	.	.	.	.	202
Beans	56	.	7	21	12	3	.	1	.	.	.	.	194
Vegetables (brassicae)	13	1	.	.	9	3	4	12	45	.	14	.	79
Vegetables (other)	22	.	3	11	6	16	12	25	2	1	.	.	65
Small fruit	22	1	26	1	10	7	19	12	4	.	.	.	27
Top fruit	55	12	11	12	6	.	2	2	.	.	.	.	99
Other tillage	49	.	28	12	.	2	2	3	4	.	.	.	45
All tillage	29	2	12	23	21	5	2	3	1	1	1	.	6667
Grass under 5 years	24	10	20	15	11	9	3	6	2	.	.	.	1049
Grass 5 years and over	36	22	26	7	4	2	1	1	1	.	.	.	2979
All grass	34	20	25	8	5	4	1	2	1	.	.	.	4028
All crops & grass	32	12	19	15	13	5	1	2	1	1	1	.	10695

Source : British Survey of Fertiliser Practice 1996

Table EW2.1 Average fertiliser practice by grassland utilisation, England and Wales 1996

	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	81	60	57	42	115	29	30	93	17	17	1932
Grazed - mown	94	73	76	63	157	38	61	148	28	46	1562
All grazings	86	65	64	50	133	33	44	114	21	28	3494
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	100	75	75	.	145	67	77	145	50	58	10
All cut for seed	100	75	75	.	145	67	77	145	50	58	10
Cut for silage grazed	97	77	82	68	181	41	70	175	32	57	1064
Cut for silage not grazed	95	75	82	68	179	41	72	170	31	60	359
All cut for silage	96	77	82	68	180	41	70	174	32	58	1423
Cut for hay grazed	89	65	64	51	102	30	37	91	19	24	492
Cut for hay not grazed	81	66	67	38	112	31	49	91	21	32	137
All cut for hay	87	65	64	49	104	30	39	91	20	25	629
All mowings	94	73	77	62	159	38	63	149	28	48	2062
All grass	87	66	66	51	136	33	47	118	22	31	4028

Source: British Survey of Fertiliser Practice 1996

Table EW2.2 Percentage of grass area by field application rate – N, England and Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown	19	2	12	19	12	8	7	9	4	2	3	2	1932
Grazed - mown	6	1	6	14	10	8	12	16	13	7	8	1	1562
All grazings	14	1	10	17	11	8	9	12	8	4	5	1	3494
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	.	.	.	.	18	.	43	29	11	.	.	.	10
All cut for seed	.	.	.	.	18	.	43	29	11	.	.	.	10
Cut for silage grazed	3	.	4	11	8	7	11	18	17	9	11	2	1064
Cut for silage not grazed	5	1	5	8	8	7	15	13	16	10	9	3	359
All cut for silage	4	.	4	10	8	7	12	16	16	9	10	2	1423
Cut for hay grazed	11	2	11	20	15	11	14	11	4	1	.	.	492
Cut for hay not grazed	19	1	15	13	22	4	15	2	2	4	.	3	137
All cut for hay	13	2	12	18	17	10	14	9	4	2	.	1	629
All mowings	6	1	6	13	10	8	13	14	13	7	7	2	2062
All grass	13	1	9	16	12	8	9	11	8	4	5	2	4028

Source : British Survey of Fertiliser Practice 1996

Table EW2.3 Percentage of grass area by field application rate – P_2O_5, England and Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown	40	28	24	5	1	.	.	1	.	.	.	.	1932
Grazed - mown	27	22	33	13	3	1	1	.	.	.	.	.	1562
All grazings	35	26	27	8	2	1	.	.	.	.	.	.	3494
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	25	.	35	11	24	.	.	4	.	.	.	.	10
All cut for seed	25	.	35	11	24	.	.	4	.	.	.	.	10
Cut for silage grazed	23	19	35	16	4	2	1	.	.	.	.	.	1064
Cut for silage not grazed	25	21	34	11	7	1	.	.	.	.	.	.	359
All cut for silage	23	20	34	15	5	2	1	.	.	.	.	.	1423
Cut for hay grazed	35	27	29	8	.	.	.	.	.	.	.	.	492
Cut for hay not grazed	34	25	30	8	3	.	.	.	.	.	.	.	137
All cut for hay	35	26	30	8	1	.	.	.	.	.	.	.	629
All mowings	27	21	33	13	4	1	.	.	.	.	.	.	2062
All grass	34	25	28	9	2	1	.	.	.	.	.	.	4028

Source : British Survey of Fertiliser Practice 1996

Table EW2.4 Percentage of grass area by field application rate – K_2O, England and Wales 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown	43	25	24	5	2	1	.	.	.	.	.	.	1932
Grazed - mown	24	15	26	12	9	7	2	4	1	1	.	.	1562
All grazings	36	21	25	7	4	3	1	1	1	.	.	.	3494
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	25	.	18	28	7	17	.	4	.	.	.	.	10
All cut for seed	25	.	18	28	7	17	.	4	.	.	.	.	10
Cut for silage grazed	18	12	24	13	12	10	3	5	1	1	.	.	1064
Cut for silage not grazed	18	12	23	14	12	10	3	3	3	.	.	.	359
All cut for silage	18	12	24	13	12	10	3	5	2	1	.	.	1423
Cut for hay grazed	36	20	31	9	3	1	.	.	1	.	.	.	492
Cut for hay not grazed	33	20	28	7	6	.	.	2	3	.	.	.	137
All cut for hay	36	20	30	8	3	1	.	.	1	.	.	.	629
All mowings	23	14	26	12	9	7	2	4	2	1	.	.	2062
All grass	34	20	25	8	5	4	1	2	1	.	.	.	4028

Source : British Survey of Fertiliser Practice 1996

Table EW3.0 Product and nutrient use by month of application, England & Wales 1996

(a) Product Use row%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total product ('000 tonnes)
Straight N	0	5	31	39	13	4	3	2	1	0	0	0	1973
Straight P	0	11	11	18	4	4	3	12	13	16	6	1	48
Straight K	2	14	14	9	6	3	5	2	15	18	7	6	53
Compounds	1	5	24	20	11	9	4	4	9	10	3	1	1946
Unknown	9	7	22	14	2	4	2	1	7	16	10	8	55
All fertilisers	1	5	27	29	12	6	3	3	5	6	2	0	4075

(b) Nutrient Use row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total nutrient ('000 tonnes)
N	0	5	30	36	14	7	4	3	1	1	0	0	962
P_2O_5	1	6	20	15	7	3	2	4	16	19	5	1	260
K_2O	2	6	20	14	8	7	3	4	13	16	5	1	325
Total	1	5	26	28	11	7	3	3	6	7	2	0	1547

Note: '*product use*' refers to total tonnage of the products used by farmers in the survey year 1996
'*nutrient use*' refers to the tonnage of each nutrient contained in the products used (eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P_2O_5 and 10kg of K_2O; 100kg of ammonium nitrate, one of the the 'straight N' products, contains typically 34.5 kg of N)

Source: British Survey of Fertiliser Practice 1996

Table EW5.1 Average fertiliser practice on dairy farms, England and Wales 1996

	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
Winter wheat	99	65	67	30	162	65	76	160	42	51	109
Spring barley	97	85	80	67	85	38	48	83	33	38	50
Winter barley	99	80	81	50	132	60	69	131	48	56	112
Oats	.	.	.	.	.	.	.	.	.	.	8
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	3
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	9
Sugar beet	.	.	.	.	.	.	.	.	.	.	2
Oilseed rape	.	.	.	.	.	.	.	.	.	.	9
Linseed	.	.	.	.	.	.	.	.	.	.	2
Forage maize	71	60	42	95	76	67	83	53	40	35	85
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	3
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	8
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	5
Peas	.	.	.	.	.	.	.	.	.	.	0
Beans	.	.	.	.	.	.	.	.	.	.	2
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	4
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	6
All tillage	90	71	67	59	125	64	79	113	45	52	422
Grass under 5 years	98	70	78	65	225	46	90	220	32	71	356
Grass 5 years and over	92	68	68	66	180	35	58	166	24	39	804
All grass	93	68	70	66	189	37	66	177	25	46	1160
All crops & grass	93	69	69	65	180	42	67	167	29	47	1582

Source: British Survey of Fertiliser Practice 1996

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, England and Wales 1996

	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
Winter wheat	96	89	82	18	180	68	80	172	60	66	57
Spring barley	91	86	88	56	100	44	52	92	38	46	68
Winter barley	95	70	73	45	140	56	65	133	39	47	104
Oats	94	89	89	31	90	57	60	84	51	53	19
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	0
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	6
Sugar beet	.	.	.	.	.	.	.	.	.	.	1
Oilseed rape	.	.	.	.	.	.	.	.	.	.	8
Linseed	.	.	.	.	.	.	.	.	.	.	7
Forage maize	66	68	75	81	91	92	75	60	62	57	29
Turnips (stock)	83	97	97	61	50	65	73	42	63	70	13
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	9
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	8
Peas	.	.	.	.	.	.	.	.	.	.	1
Beans	.	.	.	.	.	.	.	.	.	.	5
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	2
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	4
All tillage	90	79	79	45	135	61	67	121	48	53	342
Grass under 5 years	96	84	81	61	139	35	49	134	29	40	324
Grass 5 years and over	81	70	68	52	89	26	29	72	18	20	1390
All grass	83	71	69	53	96	28	32	79	20	22	1714
All crops & grass	83	72	70	53	99	30	35	82	22	24	2056

Source: British Survey of Fertiliser Practice 1996

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, England and Wales 1996

	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
Winter wheat	100	76	79	16	183	59	72	182	45	56	478
Spring barley	94	73	83	17	105	43	69	99	32	57	65
Winter barley	100	79	83	26	140	61	76	140	48	63	204
Oats	99	75	76	13	131	56	74	129	42	56	37
Rye	.	.	.	.	.	.	.	.	.	.	7
Early potatoes	.	.	.	.	.	.	.	.	.	.	6
Maincrop potatoes	95	87	93	52	173	193	247	165	168	229	27
Sugar beet	95	70	84	30	88	51	110	84	36	93	28
Oilseed rape	95	75	73	25	184	64	67	175	48	48	102
Linseed	.	.	.	.	.	.	.	.	.	.	6
Forage maize	77	76	55	85	58	57	79	45	44	43	28
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	6
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	3
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	9
Peas	16	26	35	34	25	47	70	4	12	25	19
Beans	21	52	52	4	140	80	87	30	42	45	21
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	6
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	4
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	2
Other tillage	.	.	.	.	.	.	.	.	.	.	4
All tillage	95	76	78	22	157	64	83	149	49	65	1064
Grass under 5 years	93	60	67	39	184	55	75	172	33	50	178
Grass 5 years and over	80	45	45	28	115	36	40	92	16	18	320
All grass	84	50	52	31	138	43	54	116	21	28	498
All crops & grass	90	64	67	26	150	57	73	135	37	49	1562

Source: British Survey of Fertiliser Practice 1996

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, England and Wales 1996

	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	100	44	44	25	169	47	50	169	21	22	31
Winter wheat	98	73	68	9	190	69	73	187	51	50	2130
Spring barley	95	75	79	8	101	52	64	96	39	51	261
Winter barley	98	83	82	6	142	65	73	139	53	60	616
Oats	99	72	70	9	129	77	85	128	55	59	67
Rye	100	56	59	0	136	48	67	136	27	39	19
Early potatoes	97	85	85	14	165	209	232	160	177	196	42
Maincrop potatoes	93	94	96	29	198	202	280	185	191	268	145
Sugar beet	96	58	73	33	116	70	132	111	41	97	306
Oilseed rape	95	77	70	8	202	66	65	192	51	46	477
Linseed	78	24	25	6	73	66	93	56	16	23	81
Forage maize	53	62	64	70	76	100	121	41	62	77	14
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	1
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	7
Other roots/green crops	90	67	67	19	77	76	91	69	51	61	11
Peas	9	52	53	8	24	61	71	2	32	38	182
Beans	6	51	44	6	73	63	66	4	32	29	166
Vegetables (brassicae)	91	89	89	5	242	75	199	221	66	176	67
Vegetables (other)	76	70	75	12	114	91	130	86	64	97	61
Small fruit	82	53	78	37	95	85	97	78	45	76	27
Top fruit	75	51	48	0	59	36	50	44	18	24	97
Other tillage	55	42	38	20	112	62	75	61	26	28	31
All tillage	90	72	70	10	169	71	85	153	51	59	4839
Grass under 5 years	91	66	70	13	177	61	82	162	41	57	191
Grass 5 years and over	84	45	44	10	128	41	50	108	19	22	465
All grass	86	50	50	11	141	47	61	121	24	30	656
All crops & grass	90	69	67	10	166	69	83	149	48	56	5495

Source: British Survey of Fertiliser Practice 1996

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

Table SC1.1 Total fertiliser use, Scotland 1996

	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
Winter wheat	100	93	95	10	190	80	90	190	74	86	174
Spring barley	100	99	99	37	93	57	63	93	56	62	496
Winter barley	97	89	88	24	168	77	80	162	68	71	125
Oats	85	83	83	37	74	54	56	63	45	47	34
Rye	100	100	100	100	154	13	13	154	13	13	1
Early potatoes	100	100	100	49	142	158	185	142	158	185	11
Maincrop potatoes	97	97	97	11	144	164	220	140	160	214	46
Sugar beet	100	100	100	27	76	159	93	76	159	93	2
Oilseed rape	98	98	98	15	179	63	74	175	61	72	77
Linseed	32	29	29	68	54	104	122	17	30	36	5
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	97	98	96	49	75	112	94	73	109	90	55
Kale and cow cabbage	100	100	93	74	100	40	47	100	40	43	13
Other roots/green crops	95	95	93	32	119	95	86	112	90	80	23
Peas	18	18	20	13	13	60	57	2	11	12	11
Beans	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	100	100	100	100	194	65	100	194	65	100	3
Vegetables (other)	85	100	100	.	39	115	63	33	115	63	3
Small fruit	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	23	23	23	10	138	62	67	32	14	16	20
All tillage	96	93	93	29	128	70	78	122	65	73	1101
Grass under 5 years	95	82	82	32	139	41	49	133	34	40	523
Grass 5 years and over	81	74	69	31	109	32	34	89	24	23	1048
All grass	85	76	73	31	118	35	38	100	26	28	1571
All crops & grass	89	82	80	30	122	49	55	108	40	44	2672

Source: British Survey of Fertiliser Practice 1996

Table SC1.2 Use of straight fertiliser, Scotland 1996

	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	.	.	.	.	.	.	.	.	.	0
Winter wheat	98	5	8	168	28	105	165	1	8	174
Spring barley	49	.	1	61	135	75	30	.	1	496
Winter barley	83	2	2	161	10	10	134	.	.	125
Oats	26	.	.	102	.	.	27	.	.	34
Rye	100	.	.	129	.	.	129	.	.	1
Early potatoes	21	.	.	148	.	.	32	.	.	11
Maincrop potatoes	.	.	6	.	.	150	.	.	9	46
Sugar beet	.	.	.	.	.	.	.	.	.	2
Oilseed rape	87	3	6	149	10	103	130	.	6	77
Linseed	2	.	.	13	.	.	.	.	.	5
Forage maize	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	8	.	.	65	.	.	5	.	.	55
Kale and cow cabbage	24	.	.	97	.	.	23	.	.	13
Other roots/green crops	12	.	6	197	.	150	24	.	9	23
Peas	.	.	2	.	.	2	.	.	.	11
Beans	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	100	.	.	129	.	.	129	.	.	3
Vegetables (other)	.	.	.	.	.	.	.	.	.	3
Small fruit	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	0
Other tillage	17	2	.	51	111	.	9	3	.	20
All tillage	58	1	3	119	32	94	69	.	3	1101
Grass under 5 years	44	1	1	124	122	103	55	1	1	523
Grass 5 years and over	23	2	.	104	70	104	24	1	.	1048
All grass	29	1	.	112	76	104	32	1	.	1571
All crops & grass	39	1	1	116	59	96	45	1	1	2672

Source: British Survey of Fertiliser Practice 1996

Table SC1.3 Use of compound fertiliser, Scotland 1996

	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	.	.	.	.	.	.	.	.	.	0
Winter wheat	61	88	88	39	83	89	24	73	78	174
Spring barley	96	99	99	66	56	62	63	56	61	496
Winter barley	61	87	86	47	78	82	29	68	70	125
Oats	70	83	83	52	54	56	36	45	47	34
Rye	100	100	100	25	13	13	25	13	13	1
Early potatoes	79	100	100	140	158	185	110	158	185	11
Maincrop potatoes	97	97	97	144	164	211	140	160	205	46
Sugar beet	100	100	100	76	159	93	76	159	93	2
Oilseed rape	87	94	93	52	65	71	45	61	66	77
Linseed	29	29	29	57	104	122	17	30	36	5
Forage maize	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	97	98	96	70	112	94	68	109	90	55
Kale and cow cabbage	100	100	93	76	40	47	76	40	43	13
Other roots/green crops	95	95	93	93	95	76	88	90	71	23
Peas	18	18	18	13	60	63	2	11	11	11
Beans	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	100	100	100	65	65	100	65	65	100	3
Vegetables (other)	85	100	100	39	115	63	33	115	63	3
Small fruit	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	0
Other tillage	19	23	23	124	50	67	23	12	16	20
All tillage	82	92	91	64	70	77	53	65	70	1101
Grass under 5 years	82	82	82	95	41	48	78	33	39	523
Grass 5 years and over	72	73	69	89	31	33	64	23	23	1048
All grass	75	76	73	91	34	38	68	25	27	1571
All crops & grass	77	82	79	81	48	54	62	39	42	2672

Source: British Survey of Fertiliser Practice 1996.

Table SC1.4 Use of lime, Scotland 1996

	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	.	.	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	3.8	.	6.7	.	0.3	10.8	1.9	.	2.1	.	2.5	2.0	174
Spring barley	12.5	.	11.5	.	.	23.9	1.9	.	2.1	.	.	2.0	496
Winter barley	8.0	.	13.5	.	1.7	23.1	2.2	.	2.9	.	1.2	2.5	125
Oats	3.8	.	3.6	.	.	7.4	2.5	.	2.7	.	.	2.6	34
Rye	.	.	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	.	.	3.9	.	.	3.9	.	.	3.4	.	.	3.4	11
Maincrop potatoes	1.9	.	.	.	.	1.9	1.2	.	.	.	.	1.2	46
Sugar beet	26.5	.	.	.	.	26.5	2.5	.	.	.	.	2.5	2
Oilseed rape	3.8	.	8.1	.	0.9	12.8	1.9	.	2.2	.	2.8	2.2	77
Linseed	.	.	.	.	.	.	.	.	.	.	.	.	5
Forage maize	.	.	.	.	.	.	.	.	.	.	.	.	.
Turnips (stock)	6.4	.	3.0	.	.	9.3	1.5	.	2.9	.	.	2.0	55
Kale and cow cabbage	9.9	.	65	.	.	74.9	2.5	.	2.8	.	.	2.8	13
Other roots/green crops	2.3	.	20.2	.	.	22.5	2.5	.	1.9	.	.	2.0	23
Peas	.	.	23.2	.	.	23.2	.	.	1.0	.	.	1.0	11
Beans	.	.	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	.	.	3
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	.	.	3
Small fruit	.	.	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	.	.	.
Other tillage	1.5	.	4.8	.	0.8	7.2	2.5	.	2.1	.	0.6	2.0	20
All tillage	8.4	.	10.4	.	0.3	19.1	2.0	.	2.3	.	1.7	2.1	1101
Grass under 5 years	4.2	.	3.2	.	0.3	7.9	1.9	.	2.7	.	1.3	2.2	523
Grass 5 years & over	1.0	.	3.9	.	0.1	5.0	1.9	.	2.6	.	0.6	2.4	1048
All grass	1.9	.	3.7	.	0.2	5.8	1.9	.	2.6	.	0.9	2.3	1571
All crops & grass	4.2	.	6.0	.	0.2	10.5	1.9	.	2.4	.	1.3	2.2	2672

Source: British Survey of Fertiliser Practice 1996

Table SC1.5 Percentage of crop area by field application rate , N, Scotland 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	.	.	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	.	2	1	.	6	2	6	36	40	8	.	.	174
Spring barley	.	1	8	12	28	42	6	3	.	.	.	.	496
Winter barley	3	3	.	2	2	6	25	31	21	4	3	.	125
Oats	15	.	14	41	7	17	4	2	.	.	.	.	34
Rye	.	.	.	.	.	.	.	100	.	.	.	.	1
Early potatoes	.	.	.	17	2	19	31	11	20	.	.	.	11
Maincrop potatoes	3	.	2	2	12	4	44	23	9	1	.	.	46
Sugar beet	.	.	.	73	.	27	.	.	.	.	.	.	2
Oilseed rape	2	2	.	2	6	23	6	15	28	13	3	.	77
Linseed	68	2	.	29	.	.	.	.	.	.	.	.	5
Forage maize	.	.	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	3	.	12	36	29	12	7	.	.	.	.	.	55
Kale and cow cabbage	.	.	8	4	58	3	11	7	9	.	.	.	13
Other roots/green crops	5	1	.	18	26	23	5	.	21	.	.	.	23
Peas	82	18	.	.	.	.	.	.	.	.	.	.	11
Beans	100	.	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	.	.	.	.	100	.	.	.	.	3
Vegetables (other)	15	.	85	.	.	.	.	.	.	.	.	.	3
Small fruit	100	.	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	.	.	0
Other tillage	77	.	.	7	2	3	.	10	.	.	2	.	20
All tillage	4	1	5	9	17	24	10	14	12	3	1	.	1101
Grass under 5 yrs	5	1	5	14	17	11	12	14	12	6	4	.	523
Grass 5 yrs and over	19	1	12	20	13	9	8	9	3	4	2	.	1048
All grass	15	1	10	18	14	9	9	10	5	4	2	.	1571
All crops & grass	11	1	8	15	15	15	9	12	8	4	2	.	2672

Source : British Survey of Fertiliser Practice 1996

Table SC1.6 Percentage of crop area by field application rate – P_2O_5, Scotland 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	.	.	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	7	3	8	15	55	11	.	.	.	.	.	.	174
Spring barley	1	6	29	46	18	.	.	.	.	.	.	.	496
Winter barley	11	4	6	22	49	4	3	1	.	.	.	.	125
Oats	17	4	33	26	14	6	.	.	.	.	.	.	34
Rye	.	100	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	.	.	.	.	13	20	10	21	36	.	.	.	11
Maincrop potatoes	3	.	.	.	6	12	24	36	12	5	3	.	46
Sugar beet	.	.	.	.	.	27	.	73	.	.	.	.	2
Oilseed rape	2	7	9	58	23	.	.	.	.	.	.	.	77
Linseed	71	.	.	.	.	29	.	.	.	.	.	.	5
Forage maize	.	.	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	2	1	4	9	27	22	9	20	5	.	.	.	55
Kale and cow cabbage	.	6	68	21	5	.	.	.	.	.	.	.	13
Other roots/green crops	5	3	10	49	.	7	.	24	3	.	.	.	23
Peas	82	.	.	18	.	.	.	.	.	.	.	.	11
Beans	100	.	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	100	.	.	.	.	.	.	.	.	3
Vegetables (other)	.	.	.	25	.	15	60	.	.	.	.	.	3
Small fruit	100	.	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	.	.	0
Other tillage	77	5	9	3	.	4	2	.	.	.	.	.	20
All tillage	7	5	19	34	26	4	2	3	1	.	.	.	1101
Grass under 5 years	18	23	36	11	9	1	1	1	.	.	.	.	523
Grass 5 years and over	26	31	30	9	3	.	1	.	.	.	.	.	1048
All grass	24	29	32	9	4	1	1	1	.	.	.	.	1571
All crops & grass	18	21	27	18	12	2	1	1	.	.	.	.	2672

Source : British Survey of Fertiliser Practice 1996

Table SC1.7 Percentage of crop area by field application rate – K_2O, Scotland 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Spring wheat	.	.	.	.	.	.	.	.	.	.	.	.	0
Winter wheat	5	3	4	10	52	20	2	4	.	.	.	.	174
Spring barley	1	3	22	43	27	2	1	.	.	.	.	.	496
Winter barley	12	4	5	17	51	6	4	1	.	.	.	.	125
Oats	17	4	29	30	11	9	.	.	.	.	.	.	34
Rye	.	100	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	.	.	.	.	11	20	.	24	36	.	10	.	11
Maincrop potatoes	3	.	.	.	2	8	11	10	27	29	9	3	46
Sugar beet	.	.	.	.	73	27	.	.	.	.	.	.	2
Oilseed rape	2	5	10	47	30	.	.	5	.	.	2	.	77
Linseed	71	.	.	.	.	29	.	.	.	.	.	.	5
Forage maize	.	.	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	4	1	7	12	38	19	3	16	.	.	.	.	55
Kale and cow cabbage	7	0	71	16	5	.	.	.	.	.	.	.	13
Other roots/green crops	7	1	12	36	16	14	.	14	1	.	.	.	23
Peas	80	2	.	18	.	.	.	.	.	.	.	.	11
Beans	100	.	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	.	.	100	.	.	.	.	.	.	3
Vegetables (other)	.	.	25	60	15	.	.	.	.	.	.	.	3
Small fruit	100	.	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	.	.	0
Other tillage	77	5	9	3	.	4	.	.	2	.	.	.	20
All tillage	7	4	15	30	31	7	2	2	1	1	.	.	1101
Grass under 5 years	18	21	31	10	11	6	1	.	.	.	.	.	523
Grass 5 years and over	31	29	26	8	3	2	1	.	.	.	.	.	1048
All grass	27	27	27	9	5	3	1	.	.	.	.	.	1571
All crops & grass	20	19	23	16	15	4	1	1	.	.	.	.	2672

Source : British Survey of Fertiliser Practice 1996

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 1996

	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	80	71	66	20	97	27	26	77	19	18	1021
Grazed - mown	98	90	89	65	152	49	57	148	44	51	320
All grazings	83	75	71	29	110	32	34	92	24	24	1341
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	.	.	.	.	.	.	.	.	.	.	0
All cut for seed	.	.	.	.	.	.	.	.	.	.	0
Cut for silage grazed	99	97	97	73	165	51	60	164	50	58	228
Cut for silage not grazed	95	92	89	50	168	55	67	159	50	60	165
All cut for silage	97	95	94	64	166	53	63	162	50	59	393
Cut for hay grazed	94	72	71	46	119	43	48	112	30	34	92
Cut for hay not grazed	98	78	78	33	134	35	37	131	27	29	56
All cut for hay	96	74	74	42	124	40	44	118	29	33	148
All mowings	97	89	88	58	155	50	59	150	44	52	541
All grass	85	76	73	31	118	35	38	100	26	28	1571

Source: British Survey of Fertiliser Practice 1996

Table SC2.2 Percentage of grass area by field application rate – N, Scotland 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown	20	2	12	24	14	8	5	8	3	2	2	.	1023
Grazed - mown	3	1	2	4	17	12	21	20	8	11	1	.	322
All grazings	17	2	10	20	15	9	8	10	4	4	2	.	1345
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
All cut for seed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for silage grazed	2	1	.	2	12	14	22	21	11	14	2	.	230
Cut for silage not grazed	52	.	2	4	5	7	5	5	10	5	4	.	171
All cut for silage	31	.	1	4	8	10	12	12	10	9	3	.	401
Cut for hay grazed	6	.	7	9	28	8	20	18	2	3	.	.	92
Cut for hay not grazed	2	.	12	5	23	17	14	8	3	2	12	.	56
All cut for hay	4	.	9	8	26	11	18	14	2	3	4	.	148
All mowings	26	.	3	4	12	10	13	12	8	8	3	.	549
All grass	22	1	9	17	13	9	8	9	5	4	2	.	1581

Source: British Survey of Fertiliser Practice 1996

Table SC2.3 Percentage of grass area by field application rate – P_2O_5, Scotland 1996

row %	0	<25	25-	50-	75-	kg/ha 100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed – not mown	26	30	30	10	2	1	•	1	•	•	•	•	1009
Grazed - not mown	29	34	30	5	1	.	.	.	.	.	.	.	1021
Grazed - mown	10	17	32	21	13	2	3	.	.	.	.	.	320
All grazings	25	31	30	9	4	.	1	.	.	.	.	.	1341
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
All cut for seed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for silage grazed	3	14	35	27	14	3	4	.	.	.	.	.	228
Cut for silage not grazed	8	16	38	16	11	1	2	6	1	.	.	.	165
All cut for silage	5	15	36	23	13	2	3	3	.	.	.	.	393
Cut for hay grazed	28	24	26	8	12	.	.	.	.	1	.	.	92
Cut for hay not grazed	22	13	58	7	.	.	.	.	.	.	.	.	56
All cut for hay	26	20	37	8	8	.	.	.	.	.	.	.	148
All mowings	11	16	36	19	11	2	2	2	.	.	.	.	541
All grass	24	29	32	9	4	1	1	1	.	.	.	.	1571

Source: British Survey of Fertiliser Practice 1996

Table SC2.4 Percentage of grass area by field application rate – K_2O, Scotland 1996

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+	Fields in sample
Grazed - not mown	34	33	27	5	1	1	.	.	.	.	.	.	1021
Grazed - mown	11	16	23	21	18	9	2	.	.	.	.	.	320
All grazings	29	29	26	8	5	2	.	.	.	.	.	.	1341
Cut for seed grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for seed not grazed	.	.	.	.	.	.	.	.	.	.	.	.	0
All cut for seed	.	.	.	.	.	.	.	.	.	.	.	.	0
Cut for silage grazed	3	13	24	25	22	11	2	.	.	.	.	.	228
Cut for silage not grazed	11	12	27	16	15	12	4	3	.	1	.	.	165
All cut for silage	6	12	26	21	19	11	3	1	.	1	.	.	393
Cut for hay grazed	29	25	20	10	10	3	3	.	.	.	.	.	92
Cut for hay not grazed	22	13	52	11	2	.	.	.	.	.	.	.	56
All cut for hay	26	21	31	10	7	2	2	.	.	.	.	.	148
All mowings	12	15	27	18	16	9	3	1	.	.	.	.	541
All grass	27	27	27	9	5	3	.	.	.	.	.	.	1571

Source: British Survey of Fertiliser Practice 1996

Table SC3.0 Product and nutrient use by month of application, Scotland 1996

(a) Product Use

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total product ('000 tonnes)
Straight N	0	3	20	43	16	8	6	2	1	0	0	0	194
Straight P	0	23	2	57	3	0	0	0	14	0	0	0	4
Straight K	0	21	18	30	5	7	1	0	0	19	0	0	3
Compounds	0	1	18	42	14	9	3	4	4	4	1	0	497
Unknown	0	0	3	28	0	29	0	0	0	40	0	0	3
All fertilisers	0	2	18	42	15	9	4	3	3	3	0	0	702

(b) Nutrient Use

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total nutrient ('000 tonnes)
N	0	2	19	44	16	9	4	3	1	1	0	0	158
P_2O_5	0	2	19	39	13	5	2	4	7	8	1	0	59
K_2O	0	2	18	38	13	8	2	4	7	8	1	0	64
Total	0	2	18	42	15	8	3	3	4	4	1	0	281

Note: product use refers to total tonnage of the products used by farmers in the survey year 1996
nutrient use refers to the tonnage of each nutrient contained in the products used (eg 100kg of a 20:10:10 compound contains 20kg of N, 10kg of P_2O_5 and 10kg of K_2O;
100kg of ammonium nitrate, one of the the 'straight N' products, contains typically 34.5 kg of N)

Source: British Survey of Fertiliser Practice 1996

Table SC5.1 Average fertiliser practice on general cropping farms, Scotland 1996

	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
Winter wheat	100	95	98	6	191	81	94	191	76	92	120
Spring barley	99	99	98	21	100	59	69	100	58	68	242
Winter barley	94	92	93	12	182	80	83	171	73	77	62
Oats	.	.	.	.	.	.	.	.	.	.	7
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	8
Maincrop potatoes	97	97	97	11	145	162	225	140	157	219	42
Sugar beet	.	.	.	.	.	.	.	.	.	.	1
Oilseed rape	98	98	98	12	184	61	74	181	60	73	63
Linseed	.	.	.	.	.	.	.	.	.	.	1
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	100	100	100	35	77	110	108	77	110	108	19
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	0
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	7
Peas	19	19	21	9	13	60	57	2	12	12	10
Beans	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	3
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	3
Small fruit	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	6
All tillage	96	94	95	16	141	74	88	135	70	83	596
Grass under 5 years	92	70	70	28	130	43	50	120	30	35	98
Grass 5 years and over	78	68	63	19	146	33	37	114	22	23	122
All grass	85	69	66	23	137	38	44	117	26	29	220
All crops & grass	93	87	87	18	140	66	78	130	57	68	816

Source: British Survey of Fertiliser Practice 1996

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, Scotland 1996

	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
Winter wheat	100	84	84	35	208	99	97	208	83	81	14
Spring barley	98	98	98	63	95	57	58	93	56	57	38
Winter barley	100	100	100	50	165	83	83	165	83	83	11
Oats	.	.	.	.	.	.	.	.	.	.	0
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	1
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	2
Sugar beet	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	.	.	.	.	.	.	.	.	.	.	1
Linseed	.	.	.	.	.	.	.	.	.	.	0
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	1
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	0
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	1
Peas	.	.	.	.	.	.	.	.	.	.	0
Beans	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	8
All tillage	89	87	87	53	132	72	69	117	62	60	77
Grass under 5 years	97	95	92	64	177	40	55	172	38	51	62
Grass 5 years and over	93	83	81	40	122	30	37	113	25	30	160
All grass	94	85	83	43	130	32	40	122	27	33	222
All crops & grass	93	85	83	45	131	40	46	121	34	38	299

Source: British Survey of Fertiliser Practice 1996

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 1996

	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
Winter wheat	100	86	86	17	183	73	74	183	63	64	33
Spring barley	100	99	99	50	87	55	58	87	55	58	109
Winter barley	100	100	93	6	147	70	76	147	70	71	22
Oats	100	95	95	62	79	53	58	79	51	55	16
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	2
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	1
Sugar beet	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	93	93	93	19	127	70	70	118	65	65	11
Linseed	.	.	.	.	.	.	.	.	.	.	3
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	93	93	93	65	67	115	74	62	107	68	14
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	4
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	6
Peas	.	.	.	.	.	.	.	.	.	.	0
Beans	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	2
Other tillage	.	.	.	.	.	.	.	.	.	.	223
All tillage	95	93	92	37	109	65	66	104	61	61	125
Grass under 5 years	100	85	86	22	157	42	44	157	36	38	149
Grass 5 years and over	90	78	78	16	103	28	31	93	22	24	274
All grass	94	81	81	19	128	34	37	120	28	30	497
All crops & grass	95	86	85	26	120	48	50	114	41	42	

Source: British Survey of Fertiliser Practice 1996

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 1996

	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
Winter wheat	100	86	86	17	183	73	74	183	63	64	33
Spring barley	100	99	99	50	87	55	58	87	55	58	109
Winter barley	100	100	93	6	147	70	76	147	70	71	22
Oats	100	95	95	62	79	53	58	79	51	55	16
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	2
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	1
Sugar beet	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	93	93	93	19	127	70	70	118	65	65	11
Linseed	.	.	.	.	.	.	.	.	.	.	3
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	93	93	93	65	67	115	74	62	107	68	14
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	4
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	6
Peas	.	.	.	.	.	.	.	.	.	.	0
Beans	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	2
All tillage	95	93	92	37	109	65	66	104	61	61	223
Grass under 5 years	100	85	86	22	157	42	44	157	36	38	125
Grass 5 years and over	90	78	78	16	103	28	31	93	22	24	149
All grass	94	81	81	19	128	34	37	120	28	30	274
All crops & grass	95	86	85	26	120	48	50	114	41	42	497

Source: British Survey of Fertiliser Practice 1996

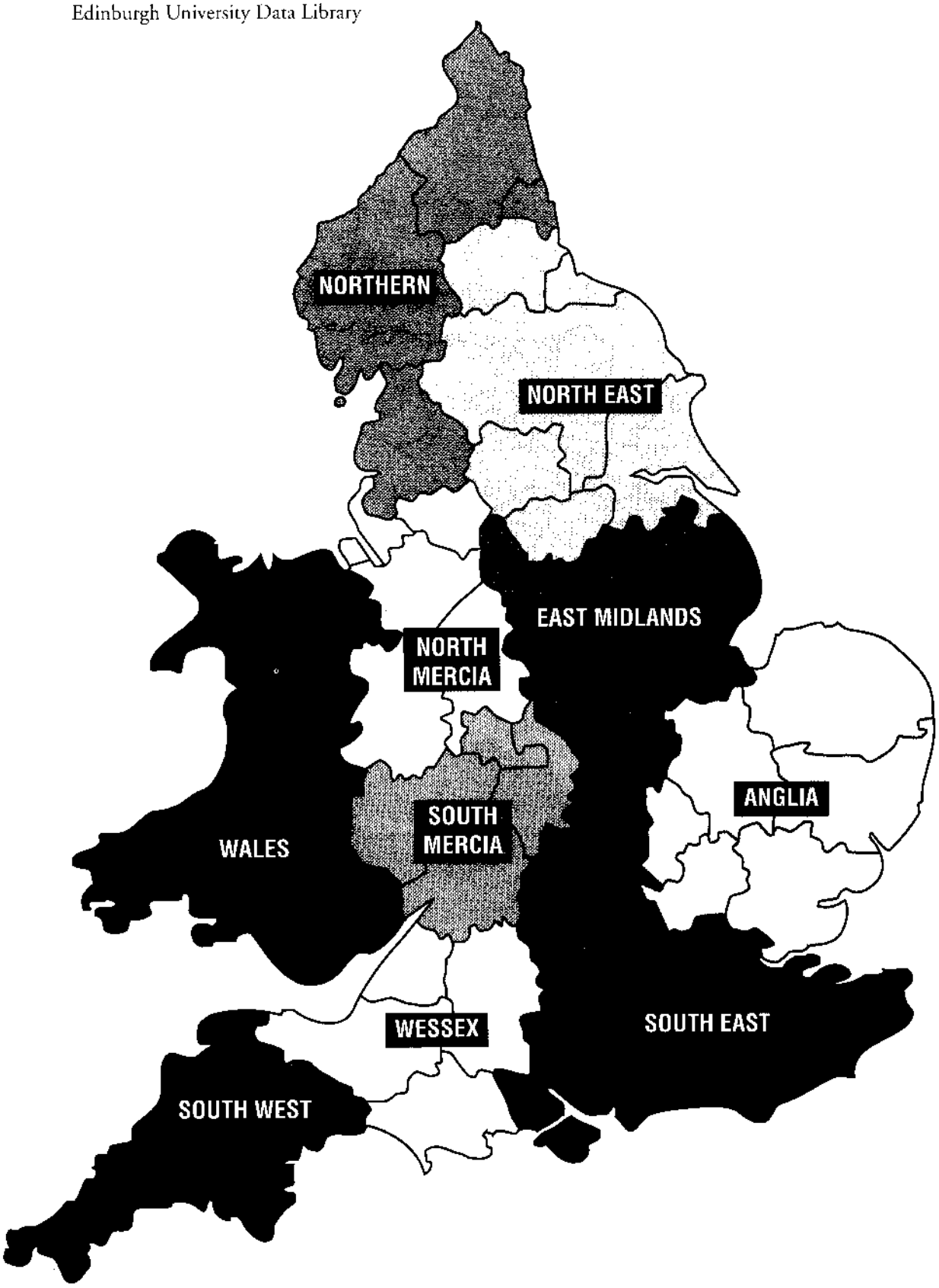
NB Some of these estimates are based on very few fields in the sample and should be treated with great caution.

APPENDIX TO SECTION D

CONTENTS

BRITISH SURVEY OF FERTILISER PRACTICE
1996 BSFP Regions[1] in England and Wales

Generalised from digital maps provided by
Edinburgh University Data Library



[1]MAFF administrative regions have been revised since April 1996 as a result of changes to county boundaries and nomenclature brought about by the introduction of unitary local authorities. The BSFP regions marked above are based on the 1995 MAFF administrative regions.

BRITISH SURVEY OF FERTILISER PRACTICE
BSFP Regions[1] in Scotland

Generalised from digital maps provided by
Edinburgh University Data Library

[1]SOAEFD administrative regions have been revised since April 1996 as a result of changes to county boundaries and nomenclature brought about by the introduction of unitary local authorities. The BSFP regions marked above are based on the 1995 SOAEFD administrative regions.

Table GB3.1 Product type as percentage of all product used by crop group in Great Britain 1996

column %	spring cereal	winter cereal	potatoes	sugar beet	oilseed 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	0.8	.	0.1	2.5	1.1	0.9	.	0.4	0.1	.	0.1	0.5
Urea	0.3	3.5	.	0.6	4.1	1.6	2.8	0.9	0.6	0.4	3.5	0.7	1.9
Ammonium Nitrate	23.8	53.9	4.0	22.4	48.6	18.0	43.5	35.7	33.9	28.5	27.8	32.1	38.5
Other Straight N	3.9	6.9	1.9	4.0	10.7	2.6	6.2	2.8	1.0	2.2	0.3	2.4	4.5
Triple Super Phosphate	0.3	1.1	0.4	0.1	1.1	1.7	1.0	0.3	0.2	0.5	.	0.4	0.7
Single Super Phosphate	.	0.1	.	.	.	0.1	0.1	.	.	0.2	.	0.1	0.1
Other Straight P	0.1	0.4	0.1	0.4	0.2	0.7	0.4	0.3	.	0.1	0.9	0.2	0.3
Muriate of Potash	0.9	0.8	1.9	1.4	0.6	2.5	1.0	0.1	0.1	0.8	0.4	0.4	0.8
Other Straight K	0.1	0.4	0.2	7.1	0.1	0.5	0.7	.	0.1	.	.	.	0.4
NP	0.2	0.6	0.8	.	1.6	3.2	0.8	4.0	1.9	1.7	.	2.7	1.6
NK	1.9	0.6	1.4	3.6	0.6	2.1	1.1	1.9	2.4	13.0	9.8	7.3	3.8
PK	6.6	19.4	5.9	27.9	12.6	17.6	17.2	2.4	2.9	2.2	11.0	2.4	10.7
Very High N	1.6	1.8	0.5	0.2	2.0	1.0	1.6	26.2	13.4	19.7	24.6	22.2	10.7
High N	28.3	1.7	1.3	1.2	1.6	9.9	4.5	21.6	37.0	19.4	5.7	21.6	12.0
High P	0.3	0.7	3.2	1.4	0.7	2.7	1.0	0.2	.	0.2	.	0.2	0.6
High K	7.7	1.6	57.4	9.9	1.4	11.9	6.6	0.7	1.4	3.6	8.1	2.2	4.7
Low N	7.1	4.5	10.8	0.4	7.1	6.2	5.2	0.3	0.4	0.4	1.6	0.3	3.1
Low P	2.5	0.2	0.9	1.9	0.1	10.2	1.2	0.3	2.4	5.3	.	2.8	1.9
Equal NPK	13.6	0.6	8.2	.	3.9	2.8	2.6	1.2	1.6	1.2	3.5	1.2	2.0
Unknown	0.2	0.2	1.1	17.3	0.5	3.7	1.6	1.1	0.3	0.5	2.8	0.7	1.2
Total product ('000 tonnes)	**230**	**1689**	**158**	**163**	**249**	**179**	**2669**	**926**	**156**	**1010**	**8.0**	**2100**	**4769**

Source: British Survey of Fertiliser Practice 1996

Table GB3.2 Use of product type by crop group in Great Britain 1996

('000 tonnes)

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	grass for grazing	grass for hay	grass for silage	grass not spec	all grass	all tillage	all crops & grass
Calcium Ammonium Nitrate	5.9	54.1	.	0.6	25.0	7.7	0.7	2.5	3.5	.	6.7	93.3	25
Urea	0.9	67.4	.	1.1	11.6	3.3	9.9	1.1	4.5	0.3	15.8	84.2	89
Ammonium Nitrate	3.0	49.6	0.3	2.0	6.6	1.8	18.0	2.9	15.7	0.1	36.7	63.2	1838
Other Straight N	4.1	53.8	1.4	3.0	12.3	2.2	11.8	0.7	10.4	.	23.0	76.8	216
Triple Super Phosphate	1.7	54.5	1.9	0.4	8.2	8.9	9.3	0.8	14.3	.	24.3	75.7	34
Single Super Phosphate	.	36.8	.	.	2.1	3.7	4.5	0.6	52.3	.	57.4	42.6	4
Other Straight P	1.9	55.3	0.9	4.9	3.1	9.3	19.9	0.4	3.9	0.5	24.7	75.3	14
Muriate of Potash	5.9	38.5	8.4	6.2	4.3	12.2	2.4	0.2	22.0	0.1	24.6	75.4	36
Other Straight K	0.6	31.0	1.5	59.1	1.1	4.1	.	0.5	2.2	.	2.7	97.3	20
NP	0.6	13.5	1.5	.	4.9	7.4	46.8	3.8	21.4	.	72.0	28.0	79
NK	2.4	5.8	1.2	3.2	0.9	2.0	9.6	2.1	72.1	0.4	84.2	15.6	182
PK	3.0	64.1	1.8	8.9	6.1	6.2	4.4	0.9	4.4	0.2	9.8	90.2	510
Very High N	0.7	6.1	0.1	0.1	1.0	0.4	47.8	4.1	39.3	0.4	91.6	8.4	508
High N	11.3	5.1	0.3	0.4	0.7	3.1	34.8	10.1	34.2	0.1	79.1	20.9	575
High P	2.3	39.5	16.6	7.4	6.1	15.9	5.1	.	6.2	.	11.4	87.8	30
High K	7.9	12.2	40.8	7.3	1.6	9.6	3.0	1.0	16.4	0.3	20.7	79.3	223
Low N	11.1	52.3	11.7	0.4	12.1	7.5	1.6	0.4	2.8	0.1	4.8	95.2	147
Low P	6.3	3.5	1.6	3.4	0.2	19.9	3.3	4.1	57.8	.	65.2	34.8	92
Equal NPK	32.9	10.1	13.7	0.1	10.3	5.4	11.9	2.6	12.8	0.3	27.6	72.4	95
Unknown	1.0	7.1	3.1	49.1	2.0	11.6	17.0	0.7	8.0	0.4	26.2	73.8	58
Total product	**4.8**	**35.4**	**3.3**	**3.4**	**5.2**	**3.8**	**19.4**	**3.3**	**21.2**	**0.2**	**44.0**	**55.9**	**4772**

Source: British Survey of Fertiliser Practice 1996

Table GB3.3 Product use by month of application in Great Britain 1996

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product ('000 tonnes)
Calcium Ammonium Nitrate	.	12	54	25	5	2	1	.	.	.	.	.	25
Urea	.	7	34	39	10	4	4	2	.	.	.	.	89
Ammonium Nitrate	.	5	29	41	14	5	3	2	1	.	.	.	1838
Other Straight N	1	5	42	32	12	4	2	1	1	.	.	.	216
Triple Super Phosphate	1	17	13	10	4	.	5	9	15	20	5	1	34
Single Super Phosphate	.	1	.	1	5	26	.	54	14	.	.	.	4
Other Straight P	.	5	7	54	2	6	.	5	8	6	6	.	13
Muriate of Potash	2	16	19	13	9	5	7	1	7	13	4	2	36
Other Straight K	1	11	5	4	.	.	.	2	27	28	11	11	20
NP	.	6	42	27	7	8	2	.	5	3	1	.	79
NK	1	1	8	8	21	42	14	4	1	.	.	.	182
PK	3	5	8	4	2	1	.	5	27	32	10	2	510
Very High N	.	3	27	35	12	9	7	6	1	.	.	.	508
High N	.	2	27	39	20	6	3	1	1	1	.	.	575
High P	7	9	29	14	20	.	1	3	7	7	4	.	30
High K	.	13	40	27	10	2	3	1	2	3	.	.	223
Low N	.	4	21	13	4	.	.	4	23	26	4	.	147
Low P	.	2	11	23	12	41	6	4	1	1	.	.	92
Equal NPK	.	5	32	37	9	2	1	6	6	1	.	.	95
Unknown	8	6	21	15	2	5	2	1	6	17	9	8	58
	1	**5**	**26**	**31**	**12**	**7**	**3**	**3**	**5**	**5**	**2**	**.**	**4772**

Source: British Survey of Fertiliser Practice 1996

Table EW3.1 Product type as percentage of all product used by crop group, England and Wales 1996

column %	spring cereal	winter cereal	potatoes	sugar beet	oilseed 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	0.7	0.7	.	0.1	2.6	1.2	0.8	.	0.5	0.1	.	0.1	0.5
Urea	0.5	3.8	.	0.6	4.6	1.8	3.1	1.0	0.6	0.4	3.8	0.7	2.1
Ammonium Nitrate	31.9	54.3	4.5	22.5	49.9	19.0	45.5	38.3	35.3	30.9	28.9	34.3	40.7
Other Straight N	7.5	7.2	2.2	4.0	10.8	2.9	6.7	3.4	1.2	2.6	0.3	2.8	5.1
Triple Super Phosphate	0.5	1.2	0.5	0.1	1.3	1.9	1.1	0.4	0.2	0.4	.	0.4	0.8
Single Super Phosphate	.	0.1	.	.	.	0.1	0.1	.	.	0.3	.	0.1	0.1
Other Straight P	.	0.5	0.1	0.4	0.1	0.7	0.4	0.3	.	.	0.9	0.2	0.3
Muriate of Potash	1.6	0.8	2.1	1.4	0.5	2.7	1.1	0.1	0.1	0.9	0.4	0.5	0.8
Other Straight K	0.1	0.4	0.2	7.1	.	0.5	0.8	.	.	0.1	.	.	0.5
NP	0.3	0.7	0.9	.	1.6	3.5	0.9	3.5	1.8	1.2	.	2.2	1.4
NK	2.4	0.6	1.7	3.6	0.1	2.2	1.0	2.3	2.9	14.9	10.3	8.7	4.2
PK	11.5	19.9	6.7	27.9	13.9	19.4	18.7	2.8	3.5	2.3	11.7	2.6	11.9
Very High N	2.9	1.9	0.5	0.2	2.3	0.8	1.7	24.2	12.9	18.1	26.1	20.3	9.6
High N	21.9	1.6	0.6	1.2	0.9	8.4	2.8	20.8	35.9	18.0	6.1	20.5	10.3
High P	0.1	0.7	1.7	1.3	0.7	0.6	0.8	.	.	0.2	.	0.1	0.5
High K	6.8	1.7	55.8	9.9	1.2	12.9	6.3	0.6	1.5	3.9	8.6	2.4	4.6
Low N	3.8	3.3	10.4	0.4	5.7	3.7	3.8	0.2	0.4	0.4	.	0.3	2.3
Low P	3.9	0.2	1.1	1.9	.	11.6	1.3	0.2	2.2	4.3	.	2.4	1.7
Equal NPK	3.1	0.4	9.7	.	3.1	1.7	1.4	0.6	0.6	0.8	.	0.7	1.1
Unknown	0.5	0.3	1.4	17.4	0.5	4.2	1.8	1.1	0.3	0.5	3.0	0.7	1.4
Total product ('000 tonnes)	**109**	**1567**	**134**	**163**	**219**	**158**	**2350**	**722**	**129**	**863**	**7**	**1721**	**4071**

Source: British Survey of Fertiliser Practice 1996

Table EW3.2 Use of product type by crop group, England and Wales 1996

('000 tonnes)

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed 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	3.4	51.5	.	0.7	27.7	9.1	7.5	0.9	2.9	3.7	.	92.5	21
Urea	0.6	69.4	.	1.1	11.7	3.4	13.8	8.7	1.0	3.8	0.3	86.2	85
Ammonium Nitrate	2.1	51.3	0.4	2.2	6.6	1.8	35.6	16.6	2.7	16.0	0.1	64.3	1660
Other Straight N	4.0	54.3	1.4	3.2	11.4	2.2	23.3	11.9	0.7	10.7	.	76.5	207
Triple Super Phosphate	1.8	57.5	2.0	0.4	8.7	9.4	20.2	8.5	0.8	10.8	.	79.8	32
Single Super Phosphate	.	28.3	.	.	2.3	4.3	65.2	5.1	0.6	59.4	.	34.8	4
Other Straight P	.	58.5	1.0	5.4	2.3	9.3	23.4	20.2	0.4	2.2	0.5	76.6	12
Muriate of Potash	5.2	38.3	8.2	6.7	3.5	12.9	25.1	2.5	0.2	22.3	0.1	74.9	34
Other Straight K	0.6	30.3	1.5	60.7	0.5	4.2	2.3	.	.	2.3	.	97.7	19
NP	0.5	17.5	2.1	.	5.9	9.5	64.6	43.2	4.0	17.4	.	35.4	59
NK	1.5	5.2	1.3	3.4	0.2	2.0	86.2	9.5	2.2	74.1	0.4	13.6	173
PK	2.6	64.2	1.8	9.4	6.3	6.3	9.3	4.2	0.9	4.0	0.2	90.6	485
Very High N	0.8	7.5	0.2	0.1	1.3	0.3	89.8	44.8	4.3	40.2	0.5	10.2	389
High N	5.7	6.0	0.2	0.5	0.5	3.1	84.0	35.9	11.1	37	0.1	15.9	420
High P	0.6	55.5	11.1	9.8	7.5	4.6	9.8	0.8	.	9.0	.	89.1	21
High K	4.0	14.0	39.6	8.6	1.4	10.8	21.6	2.3	1.0	17.9	0.3	78.4	188
Low N	4.4	54.8	14.7	0.6	13.2	6.3	5.9	1.6	0.6	3.7	.	94.1	94
Low P	5.9	3.5	2.0	4.3	0.1	25.8	58.3	2.5	4.0	51.9	.	41.7	71
Equal NPK	7.6	15.5	28.8	.	15.0	5.9	27.2	10.0	1.7	15.4	.	72.8	45
Unknown	1.0	7.3	3.3	51.4	2.0	12.2	22.9	14.0	0.8	7.7	0.4	77.1	55
Total product	**2.7**	**38.5**	**3.3**	**4.0**	**5.4**	**3.9**	**57.7**	**17.7**	**3.2**	**21.2**	**0.2**	**42.2**	**4075**

Source: British Survey of Fertiliser Practice 1996

Table EW3.3 Product use by month of application, England & Wales 1996

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product ('000 tonnes)
Calcium Ammonium Nitrate	.	10	57	24	5	2	1	.	.	.	.	.	21
Urea	.	6	34	40	10	4	4	2	.	.	.	.	85
Ammonium Nitrate	.	5	30	40	14	5	3	2	1	.	.	.	1660
Other Straight N	1	4	42	33	11	4	2	1	1	.	.	.	207
Triple Super Phosphate	1	16	13	7	5	.	5	10	16	21	6	1	32
Single Super Phosphate	.	1	.	1	5	30	.	61	2	.	.	.	4
Other Straight P	.	2	8	54	1	6	.	5	9	7	7	.	12
Muriate of Potash	3	16	20	11	9	5	7	1	8	12	5	3	33
Other Straight K	1	11	3	4	.	.	.	2	27	29	11	11	19
NP	.	7	45	23	5	6	3	.	7	5	1	.	59
NK	1	1	8	6	21	43	15	5	.	.	.	.	173
PK	3	5	8	4	2	1	.	5	27	33	11	2	485
Very High N	.	3	31	33	11	8	7	5	1	.	.	.	389
High N	.	3	30	34	21	6	3	1	1	1	.	.	420
High P	10	13	37	.	12	.	.	3	10	10	6	.	21
High K	1	15	43	22	9	1	3	1	2	3	.	.	188
Low N	1	5	26	8	1	.	.	2	26	26	4	.	94
Low P	.	3	11	20	13	39	7	5	1	1	.	.	71
Equal NPK	.	12	35	28	7	2	1	8	6	1	.	.	45
Unknown	9	7	22	14	2	4	2	1	7	16	10	8	55
All fertiliser	**1**	**5**	**27**	**29**	**12**	**6**	**3**	**3**	**5**	**6**	**2**	**.**	**4075**

Source: British Survey of Fertiliser Practice 1996

Table EW4.1 Average fertiliser practice on tillage and grassland by MAFF Region 1996

		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	90	78	73	28	158	64	75	143	50	55	397
	All grass	77	48	49	43	165	33	57	127	16	28	475
	All crops & grass	82	60	58	37	162	48	66	133	29	38	872
Anglia	All tillage	91	67	62	5	169	70	85	154	47	52	1924
	All grass	77	31	29	5	172	43	62	133	13	18	157
	All crops & grass	90	64	59	5	169	69	84	152	44	50	2081
Northern	All tillage	92	80	84	18	166	65	85	153	52	71	281
	All grass	85	77	77	55	144	35	44	122	27	34	467
	All crops & grass	86	78	78	47	149	41	54	128	32	42	748
North East	All tillage	96	79	82	22	164	65	90	158	52	73	707
	All grass	82	68	67	57	132	35	50	108	24	34	407
	All crops & grass	89	73	74	39	149	51	71	132	37	53	1114
North Mercia	All tillage	95	82	84	37	146	62	90	139	51	76	257
	All grass	91	66	64	57	195	38	68	177	25	43	287
	All crops & grass	92	72	71	50	177	48	77	163	34	55	544
South Mercia	All tillage	91	78	71	21	150	68	71	136	53	50	414
	All grass	85	46	48	39	144	33	46	122	15	22	263
	All crops & grass	88	62	59	30	147	55	61	129	34	36	677
East Midlands	All tillage	92	76	73	8	173	69	78	159	53	56	1334
	All grass	75	45	43	22	141	32	43	105	15	19	289
	All crops & grass	87	67	65	12	165	62	71	144	42	46	1623
South East	All tillage	92	79	78	10	172	61	70	158	49	55	934
	All grass	74	38	32	32	156	40	62	115	15	20	367
	All crops & grass	85	63	60	18	167	57	68	142	36	41	1301
South West	All tillage	91	78	79	33	113	65	76	102	51	60	304
	All grass	93	82	84	51	149	32	51	138	26	43	554
	All crops & grass	92	81	83	47	141	39	57	130	32	47	858
Wales	All tillage	91	80	80	18	166	66	87	150	53	69	475
	All grass	84	75	71	54	110	33	39	92	25	27	609
	All crops & grass	86	76	73	46	124	41	51	106	32	37	1084

Source: British Survey of Fertiliser Practice 1996

Table SC3.1 Product type as percentage of all product used by crop group, Scotland 1996

column %	spring cereal	winter cereal	potatoes	sugar beet	oilseed 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	2.2	.	.	1.4	.	1.2	.	.	0.1	.	.	0.6
Urea	0.2	0.7	.	.	1.1	.	0.4	0.7	0.7	0.5	.	0.6	0.5
Ammonium Nitrate	16.6	48.8	1.1	.	39.2	10.8	29.4	26.5	27.2	15.0	8.7	22.1	25.4
Other Straight N	0.6	3.1	.	.	9.4	0.9	2.4	0.5	0.1	0.3	.	0.4	1.3
Triple Super Phosphate	.	.	.	.	.	.	.	0.2	.	0.9	.	0.5	0.3
Single Super Phosphate	.	0.4	.	.	.	.	0.2	.	.	.	.	.	0.1
Other Straight P	0.2	0.2	.	.	0.4	0.5	0.2	0.1	.	0.2	.	0.1	0.2
Muriate of Potash	0.3	0.9	1.2	.	1.3	0.5	0.7	.	.	0.4	.	0.1	0.4
Other Straight K	.	0.2	.	.	0.4	.	0.1	.	0.3	.	.	.	0.1
NP	0.1	0.3	.	.	1.3	1.0	0.3	5.6	2.4	4.5	.	4.9	2.8
NK	1.4	1.3	.	.	4.3	1.2	1.5	0.5	.	2.0	.	1.1	1.3
PK	2.2	12.5	1.9	.	3.1	4.2	6.3	0.9	.	1.8	.	1.2	3.5
Very High N	0.4	1.6	0.1	.	.	2.6	1.0	33.6	15.9	29.3	.	30.6	17.0
High N	34.1	3.4	5.0	.	6.3	20.6	16.6	24.3	42.7	28.0	.	27.0	22.2
High P	0.5	0.2	11.0	76.9	0.9	17.8	2.5	0.7	.	.	.	0.4	1.3
High K	8.4	0.7	66.4	.	2.7	4.8	9.1	1.1	0.8	1.9	.	1.4	4.9
Low N	10.0	20.5	13.1	.	17.4	23.8	15.9	0.4	.	0.4	28.6	0.4	7.5
Low P	1.3	0.6	.	.	0.4	.	0.7	0.6	3.6	11	.	4.9	3.0
Equal NPK	23.0	2.2	0.3	23.1	10.1	11.3	11.3	3.3	6.3	3.5	62.6	3.7	7.2
Unknown	.	0.1	.	.	0.2	.	.	1.0	.	0.3	.	0.7	0.4
Total product ('000 tonnes)	**121**	**122**	**24**	**.**	**30**	**22**	**319**	**204**	**27**	**147**	**.**	**378**	**698**

Source: British Survey of Fertiliser Practice 1996

Table SC3.2 Use of product type by crop group, Scotland 1996

('000 tonnes)

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed 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	19	67.6	.	.	11.0	.	97.7	.	.	2.3	.	2.3	4
Urea	7.0	22.1	.	.	8.7	.	37.8	37.5	5.0	19.7	.	62.2	4
Ammonium Nitrate	11.3	33.5	0.2	.	6.6	1.3	52.9	30.5	4.1	12.4	.	47.0	178
Other Straight N	7.7	42.1	.	.	31.0	2.1	82.9	11.2	0.3	5.5	.	17.1	9
Triple Super Phosphate	.	.	.	.	.	.	.	22.5	.	77.5	.	.	2
Single Super Phosphate	.	.	.	.	.	.	.	.	.	.	.	.	1
Other Straight P	20.6	23.5	.	.	10.5	8.6	63.2	16.2	.	20.6	.	36.8	1
Muriate of Potash	13.4	39.9	10.2	.	13.6	3.8	80.9	0.7	.	18.4	.	19.1	3
Other Straight K	.	56.8	.	.	25.3	0.2	82.3	.	17.7	.	.	17.7	1
NP	0.8	1.7	.	.	2.0	1.1	5.7	57.6	3.2	33.6	.	94.3	20
NK	19.6	17.8	.	.	14.3	2.8	54.5	12.3	.	33.1	.	45.5	9
PK	10.6	61.9	1.9	.	3.7	3.7	81.8	7.3	.	10.9	.	18.2	25
Very High N	0.5	1.7	.	.	.	0.5	2.6	57.5	3.6	36.3	.	97.4	119
High N	26.6	2.7	0.8	.	1.2	2.9	34.2	31.9	7.3	26.6	.	65.8	155
High P	6.3	3.1	29.3	2.1	2.9	41.5	85.1	14.9	.	.	.	14.9	9
High K	29.5	2.6	47.1	.	2.4	3.0	84.6	6.6	0.6	8.3	.	15.4	35
Low N	23.2	47.9	6.1	.	10.0	9.8	97.1	1.5	.	1.1	0.2	2.9	52
Low P	7.6	3.3	.	.	0.5	.	11.4	5.9	4.6	78.1	.	88.6	21
Equal NPK	55.6	5.3	0.1	0.1	6.1	4.9	72.1	13.6	3.4	10.4	0.5	27.9	50
Unknown	0.5	2.6	.	.	2.3	.	5.3	80.4	.	14.3	.	94.7	3
Total product	**17.3**	**17.5**	**3.5**	.	**4.3**	**3.1**	**45.7**	**29.2**	**3.8**	**21.1**	**0.1**	**54.2**	**698**

Source: British Survey of Fertiliser Practice 1996

Table SC3.3 Product use by month of application, Scotland 1996

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Product ('000 tonnes)
Calcium Ammonium Nitrate	.	24	39	32	5	.	.	.	.	.	.	.	4
Urea	.	28	36	18	5	5	3	3	2	.	1	.	4
Ammonium Nitrate	.	2	18	46	17	8	6	2	1	.	.	.	178
Other Straight N	.	17	45	14	14	5	.	2	2	.	.	.	9
Triple Super Phosphate	.	22	5	73	.	.	.	.	.	.	.	.	2
Single Super Phosphate	.	.	.	.	.	.	.	.	100	.	.	.	1
Other Straight P	.	34	.	57	9	.	.	.	.	.	.	.	1
Muriate of Potash	.	24	7	32	6	8	1	.	.	22	.	.	3
Other Straight K	.	.	82	18	.	.	.	.	.	.	.	.	1
NP	.	2	32	38	12	13	2	.	1	.	.	.	20
NK	.	3	12	33	11	35	4	.	2	.	.	.	9
PK	.	11	11	20	3	1	1	3	27	23	.	.	25
Very High N	2	1	12	43	15	11	7	8	.	.	.	.	119
High N	.	.	19	50	19	7	3	2	.	.	.	.	155
High P	.	.	11	45	37	1	5	2	.	.	.	.	9
High K	.	2	23	51	12	9	1	1	.	2	.	.	34
Low N	.	2	14	21	9	1	.	7	17	26	4	.	52
Low P	.	.	11	32	7	47	1	2	.	.	.	.	21
Equal NPK	.	.	30	45	11	2	.	4	6	2	1	.	50
Unknown	.	.	3	24	.	30	.	.	.	42	.	.	3
All fertilisers	.	.	.	.	.	.	.	.	.	.	.	.	0
	.	2	18	42	15	9	4	3	3	3	.	.	698

Source: British Survey of Fertiliser Practice 1996

Table SC4.1 Average fertiliser practice, North East Scotland 1996

	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
Winter wheat	100	90	100	16	183	83	91	183	75	91	43
Spring barley	99	99	98	37	95	60	66	94	59	65	181
Winter barley	91	84	82	15	170	85	86	155	71	71	35
Oats	100	100	100	65	70	49	54	70	49	54	14
Rye	.	.	.	.	.	.	.	.	.	.	1
Early potatoes	.	.	.	.	.	.	.	.	.	.	4
Maincrop potatoes	100	100	100	1	133	164	207	133	164	207	12
Sugar beet	.	.	.	.	.	.	.	.	.	.	1
Oilseed rape	93	93	93	17	175	70	66	163	65	62	25
Linseed	.	.	.	.	.	.	.	.	.	.	1
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	96	96	96	62	66	114	89	63	109	85	25
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	2
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	7
Peas	.	.	.	.	.	.	.	.	.	.	4
Beans	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	2
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	6
All tillage	94	91	92	31	120	74	78	112	67	72	363
Grass under 5 years	93	82	82	31	157	39	53	146	32	43	167
Grass 5 years and over	83	77	72	40	136	26	32	113	20	23	140
All grass	88	79	77	35	148	33	43	131	26	34	307
All crops & grass	91	86	85	33	132	57	64	121	49	55	670

Source: British Survey of Fertiliser Practice 1996

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

Table SC4.2 Average fertiliser practice, South East Scotland 1996

	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
Winter wheat	100	94	94	5	192	78	88	192	74	83	113
Spring barley	100	99	99	29	95	54	59	94	53	59	231
Winter barley	100	97	96	12	179	73	76	179	72	73	51
Oats	100	95	95	28	80	59	59	80	56	56	12
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	1
Maincrop potatoes	96	96	96	13	152	166	224	145	159	214	31
Sugar beet	.	.	.	.	.	.	.	.	.	.	1
Oilseed rape	100	100	100	16	176	60	72	176	60	72	41
Linseed	.	.	.	.	.	.	.	.	.	.	4
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	100	100	96	38	83	110	99	83	110	95	26
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	9
Other roots/green crops	100	100	98	15	122	78	78	122	78	77	13
Peas	.	.	.	.	.	.	.	.	.	.	7
Beans	.	.	.	.	.	.	.	.	.	.	1
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	3
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	1
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	9
All tillage	97	95	95	20	136	69	78	132	66	74	554
Grass under 5 years	97	79	79	13	124	40	41	121	31	32	190
Grass 5 years and over	74	66	60	15	106	36	32	78	24	19	341
All grass	80	70	65	15	112	37	35	90	26	23	531
All crops & grass	87	80	77	17	123	53	57	107	43	44	1085

Source: British Survey of Fertiliser Practice 1996

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

Table SC4.3 Average fertiliser practice, South West Scotland 1996

	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
Winter wheat	100	85	85	37	177	88	88	177	75	75	12
Spring barley	99	99	99	64	81	52	54	80	52	54	71
Winter barley	100	84	84	59	145	69	74	145	58	63	36
Oats	.	.	.	.	.	.	.	.	.	.	7
Rye	.	.	.	.	.	.	.	.	.	.	0
Early potatoes	.	.	.	.	.	.	.	.	.	.	5
Maincrop potatoes	.	.	.	.	.	.	.	.	.	.	2
Sugar beet	.	.	.	.	.	.	.	.	.	.	0
Oilseed rape	.	.	.	.	.	.	.	.	.	.	1
Linseed	.	.	.	.	.	.	.	.	.	.	0
Forage maize	.	.	.	.	.	.	.	.	.	.	0
Turnips (stock)	.	.	.	.	.	.	.	.	.	.	3
Kale and cow cabbage	.	.	.	.	.	.	.	.	.	.	2
Other roots/green crops	.	.	.	.	.	.	.	.	.	.	3
Peas	.	.	.	.	.	.	.	.	.	.	0
Beans	.	.	.	.	.	.	.	.	.	.	0
Vegetables (brassicae)	.	.	.	.	.	.	.	.	.	.	0
Vegetables (other)	.	.	.	.	.	.	.	.	.	.	0
Small fruit	.	.	.	.	.	.	.	.	.	.	0
Top fruit	.	.	.	.	.	.	.	.	.	.	0
Other tillage	.	.	.	.	.	.	.	.	.	.	5
All tillage	99	94	94	61	108	59	62	108	56	59	147
Grass under 5 years	93	88	87	59	149	41	50	139	36	44	157
Grass 5 years and over	85	78	73	37	109	32	36	93	25	26	560
All grass	86	79	75	40	115	33	38	99	26	29	717
All crops & grass	88	81	77	42	114	37	42	100	30	32	864

Source: British Survey of Fertiliser Practice 1996

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