THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2006

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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 2006 Survey was sponsored by the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Executive Environment and Rural Affairs Department (SEERAD). The Survey has the full support of the Farmers' Unions in England, Scotland and Wales.

The Survey is carried out annually and is based upon returns from a sample of farms. In 2006, the Survey was co-ordinated by Kynetec Ltd., who was responsible for the survey design, data collection, statistical analysis and quality control monitoring.

May 2007

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The agronomic interpretation of the Survey results benefited from advice from Chris Dawson (Chris Dawson and Associates), agronomic consultant to the Agricultural Industries Confederation (AIC).

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EXECUTIVE SUMMARY

The British Survey of Fertiliser Practice is an annual, nationally representative survey based on the selection of a random stratified sample of farms from mainland Britain. In 2006 approximately 1,300 farms were surveyed. The main purpose of the survey 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 fertilisers, organic manures and lime. Aggregated data have been obtained for Great Britain since 1983, the first year that the existing survey in England & Wales was extended to Scotland.

The main findings from the 2006 Survey on the use of each fertiliser nutrient in Great Britain are summarised below. Weather and economic factors which may have contributed to recorded changes in fertiliser use during the 2005/2006 cropping season are also discussed in the report.

Nitrogen

- The total nitrogen use on all crops and grassland declined slightly to 107 kg/ha in 2006 from 109 kg/ha in 2005. This decline is caused by a fall in the application of compound nitrogen to grassland and tillage land. The use of straight nitrogen has essentially remained unchanged from 2005.

- On tillage crops the overall total nitrogen use (147 kg/ha) fell slightly from the 2005 level. Over recent years changes in cropping areas (notably in 2001 and to a lesser extent in 2003), rather than application rates to individual crops, have been the major factor influencing the pattern of nitrogen use on the all tillage crops category. Overall rates of total nitrogen decreased on nearly all cereal crops including winter and spring barley and winter wheat, as well as potatoes and winter oilseed rape in 2006. However, it rose for sugar beet and spring oilseed rape.

- Overall total nitrogen use on grassland continued to show a decline with a drop of 2 kg/ha from the previous year. Despite a small increase in the proportion of grassland receiving compound nitrogen there was a considerable fall in the average rate of application which account for this total decline. Straight nitrogen was applied to less grassland in 2006 then in 2005 but at a higher average rate causing the overall rate to remain unchanged. The total overall nitrogen rate (72 kg/ha) was the lowest reported for both the last five years (mean: 79 kg/ha) and also for the whole survey period since 1983. This may be related to the continuing decline in dairy cow numbers in Great Britain

Phosphate

- Overall phosphate use on tillage crops in 2006 fell by 5 kg/ha compared to last year to 35 kg/ha, making it the lowest rate the survey has recorded. Phosphate use on grassland in 2006 remained the same as 2005 at 16 kg/ha, representing the lowest rate for the period. Phosphate use on all crops and grassland is now at its lowest point since the survey began in 1983, at 25 kg/ha. Whilst there has been a slight reduction in the average application rates to both grassland and tillage land, the principal cause of this overall decline is a considerable reduction in the area of tillage crops receiving a phosphate dressing. In 2006 only 57% of all tillage crops received a phosphate application, bringing the five year mean down to 62%.

Potash

- Potash use on tillage crops decreased in 2006 by 4 kg/ha to 49 kg/ha, whilst the overall rate on grassland increased slightly by 1 kg/ha to 21 kg/ha. The resulting overall change in potash use on all crops and grassland was a drop of 1 kg/ha, to 34 kg/ha. The area of tillage crops receiving potash fertiliser fell slightly to 60% (five year mean: 64%), and the area of grassland receiving potash fertiliser grew slightly to 56% (five year mean: 57%).

Sulphur

- The Survey has collected detailed information on sulphur fertiliser use since 1993, when only 3-6% of the cereal crop areas and 8% of the oilseed rape area received a sulphur application. By 1997, these proportions had increased markedly to 13-14% for cereals and 30% for oilseed rape. Since then, however, dressing covers for sulphur generally remained fairly static until 2002 when the areas increased. There have been further increases since then with over half the oilseed rape crop now being treated.

- In 2006 the recent underlying upward trend in the average application rates of the last 5 years for cereals was overturned with a fall in rates for winter wheat and winter barley and a static average application rate for spring barley. The average rate for oilseed rape also fell compared to 2005, dropping considerably by 12 kg/ha to 70 kg/ha, the lowest recorded for the last five years. The 2006 rates show a move towards the recommended practice of 25-40 kg/ha SO_3, applied as a water soluble form in early spring, for potentially sulphur-deficient cereal crops and 50-75 kg/ha for oilseed rape.

Longer term trends

The longer term trends in application rates since 1983 show that:

- Overall nitrogen use on all crops and grassland as a single category averaged at 142 kg/ha (peak 144 kg/ha) in the first five years (1983-1987) of the Great Britain data set. The means for each of the subsequent five year periods are 1988-92: 134 kg/ha, 1993-1997: 130 kg/ha, 1998-2002: 121 kg/ha and 2003-to date: 109 kg/ha, reflecting the downward trend observed on both grassland and, to a lesser extent, on tillage crops

- Overall phosphate use on tillage crops had gradually declined since 1983, from a five-year mean of 58 kg/ha in 1983-87, 54 kg/ha in 1988-1992, 53 kg/ha in 1993-97, 46 kg/ha in 1998-2002 and 39 kg/ha in the period 2003-2006. For grassland the five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-1992, 23 kg/ha in 1993-97, 20 kg/ha in 1998-2002 and 17 kg/ha for the period 2003-06. The 2006 rate of 35 kg/ha for tillage and 16 kg/ha for grassland are the lowest since Great Britain records began in 1983.

- Overall potash use on tillage crops had declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1998-1992, 62 kg/ha in 1993-1997. There was larger drop to 57 kg/ha for the period 1998-2002 and a further drop to 53 kg/ha between 2003-2006. The pattern of overall potash use on grassland has been more variable, compared to tillage crops, but has also shown a net decline between 1983 and 2006. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases in 1989-91 and in 1997. Annual potash use between 1998-2002 (mean: 26 kg/ha) and 2003-2006 (mean: 21 kg/ha) has been consistently lower than in earlier years and the value of 21 kg/ha in 2006 is only 1 kg/ha higher than that of 2005 which was the lowest value recorded since 1983.

SECTION A

THE BRITISH SURVEY OF FERTILISER PRACTICE

A1 INTRODUCTION AND STRUCTURE OF THE REPORT

The British Survey of Fertiliser Practice (BSFP) is unique in its range and in its aspiration to produce an accurate assessment of fertiliser use for England & Wales, and for Scotland. To achieve this aim, estimates from the survey data are used in conjunction with crop areas from the June Agricultural Survey (previously the Agricultural Census).[3] It relates applications of nutrients to major crop types and grassland throughout Great Britain. The report is the principal source of estimates for fertiliser applications in Great Britain, and is used by the British fertiliser industry, by Government and by the wider agricultural community. With such a high profile it is essential that the claims made from the survey are underpinned by an effective methodology. Section A2 describes this methodology, detailing measures undertaken to avoid bias and unreliability. National changes in relative cropping areas are discussed in Section A3.

Section B provides a commentary of recent changes in survey data and longer term trends. Section C presents the main tables of results from the Survey, grouped by geographic coverage. They include major crop groups, grassland, product types and farm types. Figures for estimates of 'total', 'straight' and 'compound' nutrient rates are presented in separate tables. Supplementary questions, which change each year, are also included in the Survey. Section D provides an analysis of information which was gathered in the 2006 Survey regarding the application protocols of organic manures and manufactured fertilisers.

A1.1 HISTORY

The survey has been in existence, in various forms, since 1942 for England & Wales. It was extended to Scotland in 1983. Historical data from 1942 to 1997 have been summarised in several reviews spanning this period of time.[4, 5, 6, 7]

The current methods of survey design and implementation are the result of adaptation of the original design by Rothamsted Experimental Station, undertaken by Edinburgh Data Library at the University of Edinburgh between 1992 and 1998. From 1999 until 2003 responsibility for design and analysis transferred to the Rural Business Unit at the University of Cambridge and in 2004 this responsibility was conferred on Kynetec Limited, who also retained responsibility for conducting the fieldwork.

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[3] Defra/SEERAD/NAWAD June Census data, 2005.

[4] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

[5] Church, B.M. and Lewis, D.A. (1977). Fertiliser use on farm crops, England and Wales: Information from the Survey of Fertiliser Practice, 1942-1976. *Outlook on Agriculture* **9**, 186-193.

[6] Chalmers, A.G., Kershaw, C.D. and Leech, P.K. (1990). Fertiliser use on farm crops in Great Britain: Results from the Survey of Fertiliser Practice, 1969-1988. *Outlook on Agriculture* **19**, 269-278.

[7] Chalmers, A.G., Renwick, A.W., Johnston, A.E. and Dawson, C.J. (1999). Design, development and use of a national survey of fertiliser applications. *International Fertiliser Society Proceedings* **437**, York.

A2 SURVEY METHODOLOGY

A2.1 SAMPLE

The basis of the sample framework is the June Agricultural Survey which is a sample survey undertaken annually and records information on farm size, cropping, stocking and employment. Each year, two samples are extracted from the June Survey, one for England & Wales and one for Scotland. In England & Wales, farms are classified into one of three types, cropping, livestock and horticulture. Farms are then further classified into four size groups. In Scotland, a similar number of size groups are used but farms are classified into only two types, mainly cropping and mainly livestock. This produces 20 stratification cells, 12 for England & Wales and 8 for Scotland, shown in Tables A2.1 and A2.2. Holdings less than 20 hectares in size are excluded from the BSFP sample. The process of random stratification results in more precise estimates than those which would be obtained by simple random sampling. The 'robust' farm types (coded 1-8) identified for each farm group classification in Tables A2.1 and A2.2 are defined in Section A2.4.

The number of farm holdings sampled from each cell is proportional to the total area of crops and grass (see Column 3, Tables A2.1 and A2.2). An exception to this is that in England & Wales a deliberate policy of over sampling is undertaken for the horticultural group to ensure sufficient numbers for a robust estimate to be made. The notional sampling fraction presented in Tables A2.1 and A2.2 indicates the percentage of the total population of holdings that are sampled in each cell. As the larger farms cover a greater area, a higher proportion of these holdings are sampled. The process of selecting the actual holdings to be surveyed involves two steps. First the holdings in each cell are ordered by geographic location (using the County, Parish, Holding (CPH) identifier). This enables a high degree of geographic dispersion in the sample. The number of farms to be surveyed is then drawn at random from these stratified groups. This process leads to a *sought* sample (a total of 1,491 farms) that is representative of the population as a whole. The actual sample *achieved* is influenced, like all surveys, by a number of factors.

Current June Survey data for the year of the survey were not available. Therefore, information used to draw the annual sample is to some extent historic, being at least one year old and often more, depending on which year farms most recently received and returned their June Survey forms. For this reason not all of the holdings selected were actually eligible for the survey, simply through the process of structural change. In addition, as the survey is voluntary, it is also inevitable that there will be some non-response from those that are eligible. In the 2000 survey, a move was made towards establishing a core of co-operators who would stay in the survey for a certain number of years. This procedure is already used on other Defra surveys. Co-operators in 1999 were asked if they would be prepared to stay in the survey and approximately one-third of the sample agreed to continue. It was also decided to have three reserve lists in an attempt to reduce the rate of non-response. Non-response is a problem as it may introduce bias into the survey. Clearly it would be wrong to assume that those farms that did not co-operate have the same level of fertiliser use as those that did. Reserve lists were drawn which matched geographically and by farm type and size to the continuing sample from 1999 (to provide alternatives if any of the continuing sample changed their minds). The rest of the main sample was drawn to complete the sample structure and three reserve lists were provided by selecting the nearest holding, as represented by the CPH number, which falls in the same stratification cell as the main list holding. This ensures that the geographical dispersion is maintained.

Table A2.1 Derivation of the stratified random sample for the 2006 survey, England & Wales

	farm holdings in population in 2005	total crops and grass in 2005 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
England & Wales						
Livestock						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & low ground))						
crops & grass area						
20-50 ha	18152	7.3	0.50	90	75	0.41
51-100 ha	14028	12.1	1.06	148	127	0.91
101-200 ha	7707	12.6	1.99	153	128	1.66
200+ ha	1855	6.7	4.37	81	88	4.74
Crops & mixed						
(Robust types: cereals, general cropping, mixed)						
crops & grass area						
20-50 ha	7638	3.2	0.51	39	29	0.38
51-100 ha	9597	8.5	1.08	104	83	0.86
101-200 ha	9431	16.2	2.10	198	149	1.58
200+ ha	7254	32.6	5.51	400	349	4.81
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	790	0.3	1.39	11	9	1.14
51-100 ha	245	0.2	3.27	8	7	2.86
101-200 ha	125	0.2	6.40	8	7	5.60
200+ ha	40	0.2	20.00	8	6	15.00
Total for England & Wales	76862	100.0		1248	1057	1.38

Each farm in the main sample is contacted; if for whatever reason a farm is not able to take part in the survey, the first reserve for that farm is then contacted. If this farm also refuses then the second and if necessary the third reserve is contacted. If all four farms refuse then no farm is recruited into the survey. Any over sampling (or under sampling) that occurs through this process is corrected for by the use of weighting factors, which are the inverse of the achieved sampling fraction.

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2005*.

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2005*.

Table A2.2 Derivation of the stratified random sample for the 2006 survey, Scotland

	farm holdings in population in 2005	total crops and grass in 2005 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
Scotland						
Cereal/general cropping/horticulture						
(Robust types: cereals, general cropping, horticulture)						
crops & grass area						
20-50 ha	1135	2.4	0.53	6	6	0.53
51-100 ha	1434	6.6	1.14	16	15	1.05
101-200 ha	1391	12.3	2.22	31	30	2.16
200+ ha	676	13.7	5.08	34	39	5.77
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & low ground), mixed)						
crops & grass area						
20-50 ha	3195	6.8	0.53	17	16	0.50
51-100 ha	3549	16.2	1.14	40	42	1.18
101-200 ha	2619	22.7	2.17	57	59	2.25
200+ ha	999	19.3	4.82	48	58	5.81
Total for Scotland	14998	100.0		249	265	1.77

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2006. In addition to collecting information on the fertiliser use on each field, the recorder collected general information on the holding and some supplementary information. The supplementary questions in 2006 considered a number of questions relating to the methods of applying organic manures and slurries.

A2.3 DATA PROCESSING

Some idea of the complexity of the survey can be gained from the amount data that has to be input and processed. In 2006 the 1,322 farms recorded represented almost two and a half per cent of the total crops and grass area in Britain. This equated to almost 10,000 fields and nearly 18,000 applications of fertiliser.

The high degree of detail collected per farm enabled analysis of fertiliser use at a number of levels; by crop, by type of fertiliser (straight or compound), by timing of application, by geographic region, etc. This enables the survey to present a comprehensive picture of fertiliser use in Great Britain. The longevity of the survey also means that it is invaluable for demonstrating the changing trends in fertiliser use.

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2005*.

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2005*.

A2.4 DEFINITIONS OF TERMS

1. For the purpose of the Survey, the term **Great Britain** (or **Britain**) is defined to cover England (including the Isle of Wight), Wales (including Anglesey) and mainland Scotland.

2. The **survey year** ran from autumn 2005 to autumn 2006, corresponding to the 2006 season or harvest year. The recording period for fertiliser applications varied for different crop and grass groups on farms of not less than 20 hectares (ha) in size.

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 had a uniform cropping and fertiliser history from autumn 2005. For data collection and processing purposes, separate fields with identical cropping and fertiliser management on the same farm are blocked together as one 'field', to represent the total combined area of those fields. Areas within the same natural boundary receiving different treatments (crops on fertilisers) were recorded separately. Agricultural land which had been set-aside under the Single 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 has always been collecected by the survey, but is not included in the calculatiuons of this report.

4. In the report, **tillage** is defined as all crops except grass, forestry, glasshouse crops and land designated as 'set-aside' under the Single Payment Scheme. **Grass** refers to all forms of grassland which may be grazed, conserved or grown for seed production; rough grazing is excluded.

5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser products containing nitrogen and sulphur only are classified as with nitrogen.

6. For each fertiliser nutrient, the **average field rate** (of application) is defined as the sum of nutrient applied divided by the total area of 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.

7. 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.

8. The **overall application rate** is defined as the total quantity of nutrient used, in kilograms (kg), divided by the total extent of crop area, in hectares (ha) (including any areas without application of the nutrient). When combined with information from the national total crop area estimates in the Agricultural Census, these overall application rates provide a means of estimating the tonnage of fertiliser nutrient used during the survey year.

   Any change in an overall application rate is due to a change in either the (actual) field rate of application used on farms, or to a change in the dressing cover, or to changes in both. Arithmetically, overall application rate is equivalent to the result of 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.

9. The UK farm type system, which is based on the EC system, aggregates a wide range of defined farm types into ten 'robust' types:
   (1) Cereals
   (2) General Cropping
   (3) Horticulture
   (4) Specialist Pigs
   (5) Specialist Poultry
   (6) Dairy
   (7) Cattle and Sheep (LFA)
   (8) Cattle and Sheep (low ground)
   (9) Mixed
   (10) Other

   Prior to 2004, the UK agricultural departments amalgamated the robust types 'Specialist Pigs' and 'Specialist Poultry' as the single robust type 'Pigs and Poultry'. 2006 was the first year that the BSFP adopted the revised classification following analysis that showed this would not lead to under-representation of either of these farm types through marginalisation. The composition of 'robust' types is presented in greater detail in Appendix 4. The sampling framework outlined in Section A2.1 can be related to robust types as set out below.

England & Wales:

BSFP sampling frame	*robust types*
cropping	1, 2, 9
livestock	4, 5, 6, 7, 8
horticulture	3

Scotland:

BSFP sampling frame	*robust types*
mainly cropping	1, 2, 3, 9
mainly livestock	4, 5, 6, 7, 8

Data presented in tables EW5.1 to EW5.4 and SC5.1 to SC5.4 in Section C are derived from the robust types shown below.

England & Wales:

table number	*farm type(s) as given in table title*	*robust types*
EW5.1	dairy farms	6
EW5.2	cattle and sheep farms	7, 8
EW5.3	other livestock farms	5, 9
EW5.4	cropping/horticultural farms	1, 2, 3

Scotland:

table number	*farm type(s) as given in table title*	*robust types*
SC5.1	general cropping farms	1, 2
SC5.2	dairy farms	6
SC5.3	mixed farms	5, 7, 8, 9
SC5.4	farms in Less Favoured Areas	All farms in LFAs

10. Regional analysis of the Survey data for England is based on the MAFF administrative regions, which were revised in 1996 to take account of changes to county boundaries and nomenclature resulting from the introduction of Unitary Local Authorities between April 1995 and April 1998. These revised regions are termed **BSFP regions** and are detailed in Appendices 3 and 4.

11. Where changes in application rates are termed 'significant' this indicates that the probability of a change of this magnitude arising purely by chance (sampling error) is less than five percent.

12. Commentary in Section B suggesting possible reasons for observed differences in fertiliser practice is shown in *italics*.

A3 GENERAL TRENDS AND ISSUES

A3.1 CROP AREAS AND WEATHER CONDITIONS

Annual changes in relative cropping areas, as well as any changes in fertiliser practice for individual crops, may affect nutrient application rates when aggregated across the main crop groupings. Table A3.1 provides a summary of Census estimates for areas of individual major crops, crop groupings and total tillage and grassland categories in 2004/05 and 2005/06, and illustrates percentage changes in relative cropping areas over the past five years. There were about 10.6 million hectares of managed agricultural land in Britain in 2006, of which 4.4 million hectares (42%) were cultivated for tillage cropping and the remainder, 6.2 million hectares, were grassland (excluding rough grazing).

In 2006, the area of wheat decreased by around 34,574 ha (-1.9%). The area of spring barley decreased by 56,154 ha (-10.6%) whilst the winter barley area rose slightly by 2,783 ha (0.7%) compared wih 2005. The decrease in total cereal area of 6.7% between 2004 and 2005 continued in 2006 with a slight decrease of 1.9%. The total oilseed rape area decreased by 19 kha (-3.7%), with 95% of the crop being autumn sown, compared with 94% in 2005. After a 54% increase in the linseed area in 2005 compared with the previous year, the area sown in 2006 decreased by 26.7%. The total linseed area of 33,000 ha represents only 0.8% of the total tillage area, considerably less than in 2000 when the economic returns for this crop were more favourable. The area of sugar beet decreased (-12.2%), which is the fifth year in a row that the area has declined. This trend is set to continue as a result of changes in the EU sugar regime. Forage maize and other forage crops increased by 1.3%, as did the area of potatoes (early and main crop), while the area of peas and beans decreased by 3.3%. Other tillage crop categories and the showed only small changes in area compared with 2005. The area of grass under 5 years old continued to decrease in 2006 (-4.5%), whilst the area of grass over 5 years old rose by 5%. This resulted in a net increase in a managed grass area of 207,654 ha (3.4%) campared with 2005.

The total tillage area was 177,792 ha less (-4.1%) in 2006, compared with 2001. The total area of cereals was reduced (-4.9%), with an increase in the area of wheat (+11.9%), but a decrease in the area of barley (-29%) in 2006 compared with 2001. The oilseed rape area was higher (+23.7%), but there were falls in the areas of sugar beet (27%), potatoes (15%), pulses (16%) and fodder crops (7%) in 2006 compared with 2001.

The Single Farm Payment was introduced on 1 January 2005, replacing all the previous main Common Agricultural Policy (CAP) payment schemes with a single payment. To obtain this single payment farmers must demonstrate compliance with a number of measures designed to

protect the environment. Extra payments are on offer to those who choose to take additional measures under either the Entry Level or Higher Level Stewardship schemes. It is still too early to say what impact these new schemes will have on fertiliser use. However, as one potential impact of both cross-compliance and the environmental stewardship schemes is that margins of fields will remain un-cropped, in this report, as was the case in 2005, all calculations of fertiliser rates have been made on the basis of 'sown' area.

Table A3.1 Cropping and grassland areas ('000 ha) in Great Britain, 2004/05 – 2005/06

Crops	2004/2005 '000s ha	2005/2006 '000s ha	% change since 2004/05	% change since 2000/01	2005/2006 crop areas as % of total tillage area
Wheat	1859	1824	-1.9	+11.9	42.5
Barley – winter	380	383	+0.9	-16.5	8.9
– spring	531	476	-10.4	-36.8	11.1
Total cereals[1]	*2883*	*2827*	*-1.9*	*-4.9*	*65.9*
Oilseed rape – total	519	500	-3.7	+23.7	11.7
Sugar beet	148	130	-12.2	-26.6	3.0
Potatoes[2]	133	135	+2.1	-14.5	3.2
Linseed	45	33	-26.7	+6.5	0.8
Peas/beans[3]	239	231	-3.3	-16.0	5.4
Maize/other fodder	194	197	+1.3	+4.6	4.6
Vegetables	120	118	-1.7	-0.8	2.7
Total tillage[4]	*4386*	*4290*	*-2.2*	*-2.5*	*100.0*
Set-aside and bare fallow[5]	697	661	-5.2	-21.4	
Grassland					2005/2006 grass areas as % of total grass area
Less than 5 years old	1057	1011	-4.4	-5.1	16.7
5 years and older	5035	5290	+5.1	+3.1	83.3
Total grass[6]	*6093*	*6300*	*+3.4*	*+1.6*	*100.0*
Total crops and grass[7]	*10478*	*10591*	*+1.1*	*+2.3*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not bare fallow or set-aside.
[5] including industrial crops.
[6] managed grassland, excluding rough grazing.
[7] total tillage + total grassland.

Source: Annual Defra/SEERAD/NAWAD June Census data

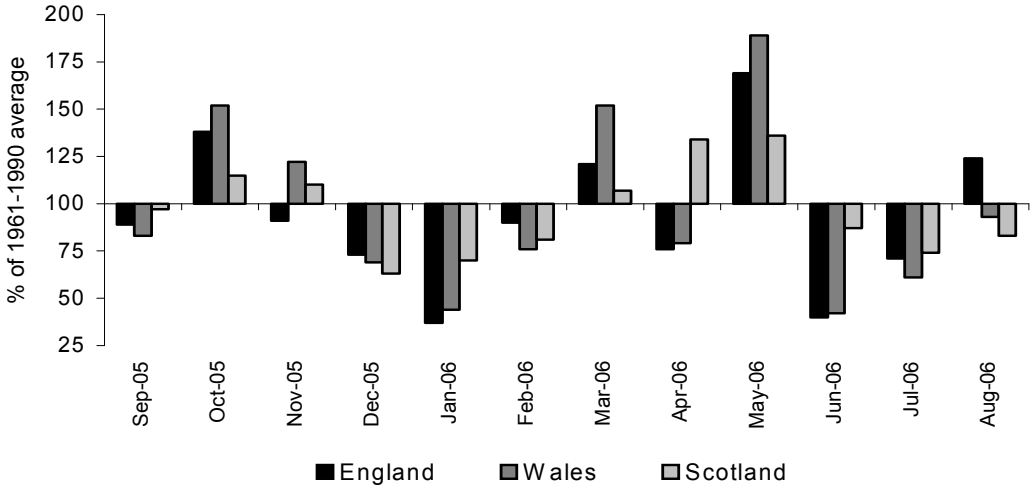
Unusual seasonal weather conditions can influence fertiliser usage in some years. For example:

- *A very wet (or very dry) autumn can delay the establishment of winter sown crops, or alter the ratio of winter to spring sown crops, with their different fertiliser requirements.*
- *Prolonged wet weather can increase leaching losses of some nutrients, particularly nitrogen and sulphur. Weather conditions also affect other aspects of soil chemistry and nutrient availability.*
- *Adverse weather conditions can disrupt planned activities, such as fertiliser spreading.*
- *Growing conditions determine plant growth and hence affect nutrient requirements.*

Autumn 2006 was characterised by a dry start followed by a wet October and November. By September 2006, nine out of the previous 11 months had had below average rainfall across England and Wales. The drought was broken in October, when rainfall was well above average and some areas received over double the 1961-90 average for the month.

Harvest conditions were mixed with some yield lost due to drought pre-harvest. In most areas, conditions were ideal for the establishment of winter-sown crops, although in some areas seedbeds were too dry in September. The wet October caused delay to the drilling of later drilled wheat and winter barley in some areas and the harvest of potatoes was also delayed.

Figure A3.1 Monthly rainfall as a % of the long term average (source: Met. Office[8])



When the weather affects the proportion of winter to spring crops (notably cereals and oilseed rape), this can have a major impact on fertiliser use as lower-yielding spring crops often require less fertiliser. The impact of all these factors on fertiliser use are discussed in Section B of this report.

Over winter rainfall was well below average, although in February parts of south-east England and East Anglia experienced above average rainfall. March was cold and wet, whereas April saw above average temperatures in England and Wales. April rainfall ranged from well below average in southwest England to well above average in northwest Scotland. In many areas fertiliser spreading was delayed due to a wet and cold spring. May was very wet in most places with temperatures well above average.

June and July were both drier than the 1961-90 average, while temperatures continued to rise to record levels. Wisley recorded a temperature of 36.5 °C on 19th July setting a new UK July temperature record.

[8] www.metoffice.gov.uk/climate/uk

SECTION B

COMMENTARY ON FERTILISER USE IN GREAT BRITAIN

This commentary refers to 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 2002 to 2006. Comments on longer term trends are made in Section B2, using data available from what were, prior to 1992, two separate Surveys of Fertiliser Practice, for England & Wales and for Scotland.

The estimates of overall application rates from the survey relate to usage on farms during the 2005/2006 growing season: they form a basis for estimating quantities of fertiliser used in Great Britain. The estimates of the average field rates provide a better indication than overall application rates of actual usage levels and also of any annual variation in fertiliser practice on farms.

The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England & Wales due to its greater area of total crops and grassland: about 8.8 million hectares in England & Wales and about 1.8 million hectares in Scotland. In what is otherwise a commentary on Britain as a whole, remarks on the separate regions are only made to highlight particular trends of interest. Readers interested in more detailed recent trends for individual crops in England & Wales or in Scotland can refer to tables presented in the final Section of this and earlier annual Reports in conjunction with the summary tables of annual fertiliser use in the main text of the 1995 report[9]. A summary of the last 15 years data is available in Chalmers 2001[10].

The nutrient rates presented and discussed in the main text of this Report are based on crop areas estimated from the survey data. Data from the 2006 Agricultural Survey on crop areas have been summarised in Table A3.1. Crop area estimates from the Agricultural Survey have greater reliability as they are derived from a far larger sample of farms. Agricultural Survey crop areas are used in the Appendix of the report to re-estimate application rates, for total tillage and grassland crop groupings, taking into account the limitations of survey crop area estimates extrapolated from a comparatively small survey sample. These adjusted rates have now been calculated for several years and the adjusted estimates are generally very close to those reported in Section B of the annual Reports. This year, grassland was virtually identical, but there was some small variation of the tillage estimates, with the BSFP rates tending to be slightly higher than the adjusted rates. This variation of tillage application rates may be due to slight differences in the national cropping profiles between the BSFP survey year, 2005-06 and the Agricultural Survey year, 2004-05.

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

[10] Chalmers A. G. (2001) A Review of fertiliser, lime and organic manure use on farm crops in Great Britain from 1983 to 1997. *Soil Use and Management* **17**, 254-262.

B1 2005 RESULTS FOR GREAT BRITAIN AND CHANGES IN RECENT YEARS

B1.1 OVERVIEW OF FERTILISER USE ON ALL CROPS AND GRASS

Overall rates of total nitrogen, phosphate and potash in Great Britain over the last five years are illustrated in Figure B1.1, which is based on data presented in Tables B1.1 and B1.2. Application rates for straight and compound nitrogen applied on crops and grassland are also presented in Table B1.1. Definitions of the terms used are set out in Section A of this report.

Figure B1.1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 2002 – 2006

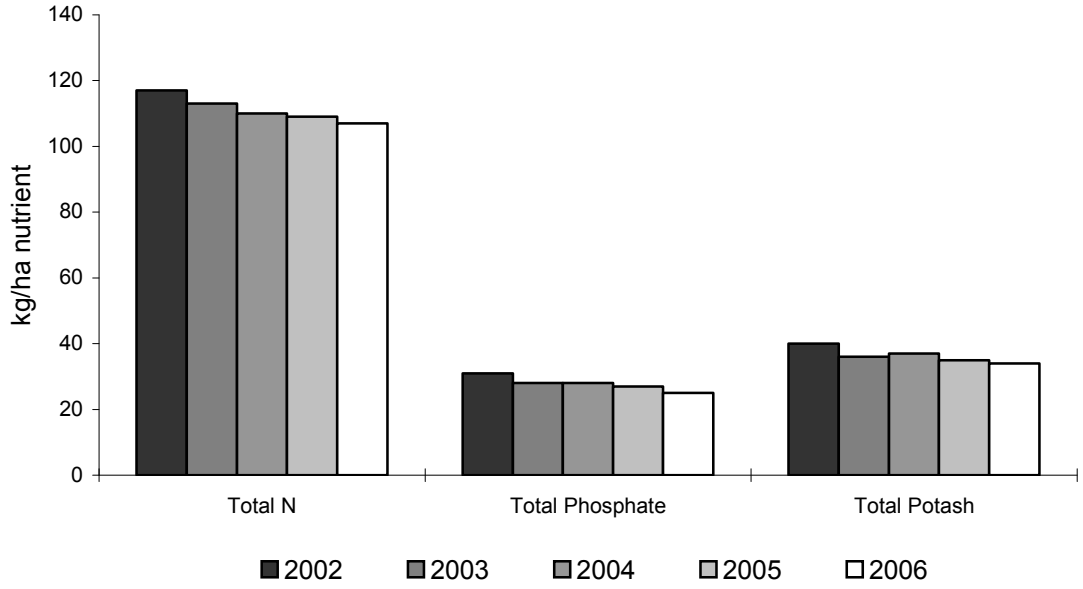


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2002 – 2006

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2002	152	89	117
2003	149	83	113
2004	152	77	110
2005	150	74	109
2006	147	72	107

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2002	128	32	76
2003	129	31	74
2004	132	27	73
2005	129	28	74
2006	128	28	74

Compound nitrogen

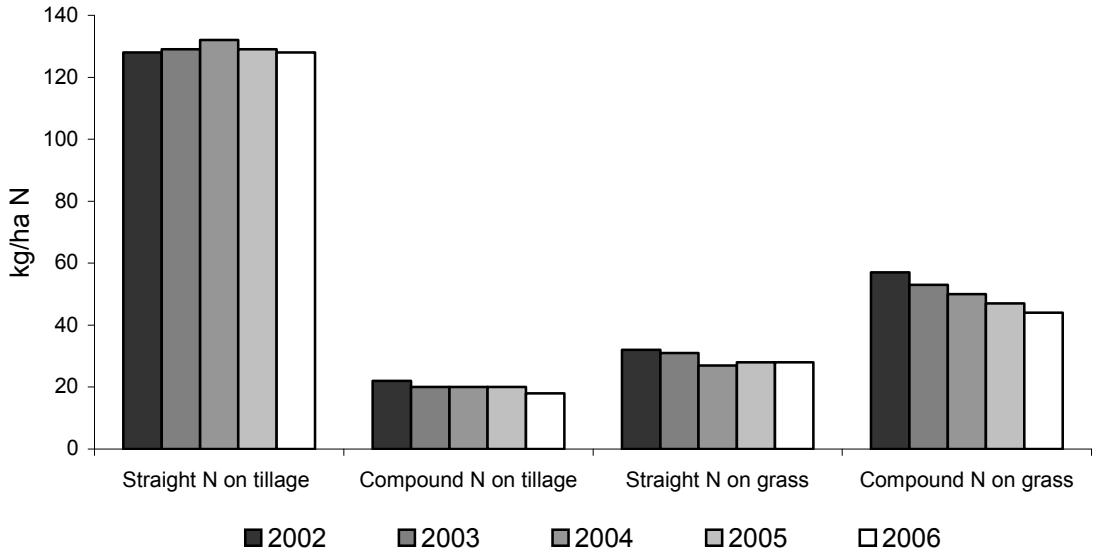
	tillage crops	*grass*	*all crops and grass*
2002	22	57	42
2003	20	53	38
2004	20	50	37
2005	20	47	35
2006	18	44	32

B1.1.1 NITROGEN

All crops and grassland

The total nitrogen use on all crops and grassland declined slightly in 2006 compared with the rates in 2005 (Figure B1.1), due to a decrease in the amount applied to both tillage crops and grass (Table B1.1). This decline is associated with a drop in the overall application rate of compound nitrogen on tillage crops and compound N on grass (Figure B1.2). Straight nitrogen on tillage crops and grass remained as in 2005.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2002 – 2006



Tillage crops

Overall total nitrogen use (147 kg/ha) decreased slightly from the 2005 level. Over recent years, changes in cropping areas (e.g. in 2003 and 2006), rather than application rates to individual crops, have been the major factor influencing the pattern of nitrogen use on the all tillage crops category. Straight N continues to be the main source of nitrogen on tillage crops.

Grassland

Overall total nitrogen use on grassland continued to show a decline, with a drop of 2 kg/ha from the previous year. The total nitrogen rate (72 kg/ha) was the lowest reported for both the last five years (mean: 79 kg/ha) and also for the whole survey period since 1983 (see section B2). This may be related to the continuing decline in dairy cow numbers in Great Britain.

B1.1.2 PHOSPHATE AND POTASH

Phosphate

Overall phosphate use on tillage crops in 2006 at 35 kg/ha revealed a significant decrease when compared with 2005, and was the lowest rate for the period 2002-2006 (Table B1.2). Phosphate use on grassland remained at the same level as the previous year, but still represents the lowest rate for the five year period. At 25 kg/ha, phosphate use on all crops and grassland is close to the five year mean of 28 kg/ha. The area of tillage crops receiving phosphate fertiliser was slightly lower than previous years at 57% (five year mean 62%), but for grassland the area receiving phosphate fertiliser was lower than the five year mean of 57% at 56%.

Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2002 – 2006

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2002	44	20	31
2003	40	18	28
2004	41	17	28
2005	40	16	27
2006	35	16	25

Total potash

	tillage crops	*grass*	*all crops and grass*
2002	57	25	40
2003	54	22	36
2004	55	22	37
2005	53	20	35
2006	49	21	34

Potash

Potash use on tillage crops decreased (-4 kg/ha) to 49 kg/ha in 2006. The overall rate of potash on grassland stabilised at 21 kg/ha, after a steady decline of 5 kg/ha over the previous four years. Over the last five years, potash use on all crops and grassland has declined. At 34 kg/ha in 2006 it was lower than the five year mean of 36 kg/ha. The area of tillage crops receiving potash fertiliser was lower than previous years at 60% (five year mean: 64%), whilst for grassland the area receiving potash fertiliser stabilised at 56% (five year mean: 57%).

B1.2 FERTILISER USE ON MAJOR TILLAGE CROPS

Overall and average field rates of fertiliser application 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 2006 are presented in Section C. Longer term trends in overall application rates of nitrogen, phosphate and potash since 1983 are summarised in Section B2.

Small apparent changes in fertiliser use on individual crops should be treated with a degree of caution as these estimates are based on a smaller number of farms and fields than the aggregate 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 Appendix 1.

Table B1.3 Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2002 – 2006

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	193	110	154	158	199	106
2003	197	107	148	152	191	103
2004	197	104	144	154	202	95
2005	195	102	142	166	201	94
2006	192	101	136	142	191	99

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	178	66	132	52	181	91
2003	186	61	128	37	179	91
2004	186	59	125	49	189	85
2005	183	58	128	43	184	85
2006	180	60	118	42	177	87

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	15	43	22	108	18	15
2003	12	46	20	116	13	13
2004	11	45	19	105	13	10
2005	13	43	14	122	17	9
2006	12	41	18	100	14	13

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	41	45	46	123	50	43
2003	39	44	41	130	38	34
2004	39	44	46	125	39	36
2005	37	40	42	153	40	37
2006	34	39	37	122	34	35

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	47	56	62	221	50	104
2003	47	57	59	214	42	91
2004	48	57	62	201	46	104
2005	44	52	57	256	42	112
2006	41	60	54	197	38	109

[a] Figures for maincrop potatoes include second earlies.

[b] Single crop grouping for the combined winter and spring oilseed rape areas.

Table B1.4 Average field rates (kg/ha) on major tillage crops, Great Britain 2002 – 2006

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	197	113	156	172	201	112
2003	199	111	149	163	194	108
2004	199	106	145	158	203	103
2005	197	105	144	171	203	101
2006	194	103	139	151	193	108

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	189	94	150	101	187	105
2003	193	90	143	122	185	105
2004	195	87	140	101	195	102
2005	190	89	137	104	191	100
2006	189	89	130	105	182	100

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	63	63	61	129	52	81
2003	60	69	70	143	42	60
2004	63	66	66	131	52	64
2005	73	66	60	153	56	79
2006	71	65	67	130	53	84

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	69	57	64	141	71	82
2003	64	54	60	149	60	63
2004	63	53	61	146	62	71
2005	61	51	61	168	63	73
2006	62	54	59	141	59	72

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2002	80	68	80	235	77	129
2003	77	66	78	237	68	125
2004	78	65	79	231	72	130
2005	72	63	78	271	68	147
2006	75	76	76	211	69	143

[a] Figures for maincrop potatoes include second earlies.

[b] Single crop grouping for the combined winter and spring oilseed rape areas.

B1.2.1 NITROGEN

Overall rates of total nitrogen (Table B1.3) decreased on all the major tillage crops except sugar beet, where there was a slight increase. Average field rates (Table B1.4) showed a similar trend.

Winter wheat

After an increase in 2003, the overall rate of total nitrogen on winter wheat remained unchanged at 197 kg/ha in 2004. Since then, the overall rate of total nitrogen on winter wheat has decreased to 195 kg/ha in 2005 and again to 192 kg/ha in 2006 (Table B1.3). The average field rate (Table B1.4) followed a similar pattern and at 194 kg/ha is at the lowest level for the period. The majority of the nitrogen continued to be applied in the straight form.

The field cropping information collected in the Survey enables separate estimates to be made of nitrogen fertiliser use on milling and non-milling (feed/seed) categories of winter wheat (Table B1.5).

Table B1.5 Average field application rates (kg/ha) of nitrogen on cereals by market use, Great Britain 2002 – 2006

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2002	208	192	118	101	149	159
2003	215	191	114	99	145	152
2004	224	188	111	99	134	151
2005	224	186	111	95	130	152
2006	218	182	107	97	129	144

The difference between the rates applied to milling and non-milling wheats reflect differences in crop husbandry and nitrogen management practices. This difference has been greater in the last two seasons (36 and 38 kg/ha in 2004 and 2005 respectively) than the average (28 kg/ha) for the period.

Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice[11]. Milling varieties are often grown as a second wheat and often receive extra nitrogen, either as a solid dressing or as late foliar urea spray, which is applied to improve the chances of achieving an adequate grain protein content for a milling premium. High yielding feed crops, rather than lower yielding varieties of milling wheat, are often grown as a first winter wheat after a break crop. This is to exploit the potential yield and residual soil nitrogen benefits from the crop rotation, and also to avoid any risk of lower grain protein concentrations as a result of high yield diluting the grain nitrogen concentration for first wheat in the rotation.

[11] Anon (2000). *Fertiliser Recommendations for Agricultural and Horticultural Crops*. MAFF Reference Book 209 (Seventh edition). The Stationery Office, London.

The non-milling crop continues to dominate the wheat crop area (Table B1.6) with only 34% of the crop area in 2006 being grown as milling wheat (5 year mean: 31%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2002 – 2006, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2002	27	73	61	39	33	67
2003	33	67	63	37	36	64
2004	30	70	60	40	33	67
2005	30	70	62	38	33	67
2006	34	66	57	43	30	70

Spring barley

Overall use of total nitrogen on spring barley declined slightly to 101 kg/ha in 2006 which is the lowest for the five year period (mean: 105 kg/ha). The overall rate of straight nitrogen increased slightly in 2006 to 60 kg/ha, reversing a three-year trend of decreasing values. However, the compound nitrogen rate decreased by 2 kg/ha to 41 kg/ha, the lowest value for the period. Average field rates for total nitrogen were 103 kg/ha in 2006, continuing their year-on-year decline since the value of 113 kg/ha in 2002. Average field rates for compound nitrogen reflected this decline.

Further analysis of the data by crop type (Table B1.5) shows that the decline in the average rate applied to the spring malting crop between 2001 and 2004 has continued in 2006 (107 kg/ha) after a brief peak in 2005 (111 kg/ha). For non-malting crops the nitrogen application rate decreased from a high of 101 kg/ha in 2002 to a five-year low of 95 kg/ha in 2005. In 2006, the N application rate on non-malting spring barley increased slightly to 97 kg/ha.

Estimated nitrogen rates on spring barley crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 14 kg/ha over the last five years.

This slightly higher use of nitrogen on malting than non-malting crops may seem anomalous, since lower rates of nitrogen are recommended for malting barley, under the same conditions of soil type and nitrogen fertility level, than for the feed varieties of barley. This recommendation is made to avoid the risk of high grain nitrogen content, which would adversely affect subsequent malt quality. However, malting crops are normally grown on soils with low nitrogen fertility and the average field rates of nitrogen reported for malting varieties in Table B1.5 are generally in the range recommended for mineral soil types with low nitrogen residues (70 - 120 kg/ha)[12]. Feed crops on the other hand are often grown within mixed rotations, which tend to have a higher soil nitrogen fertility, with consequently less need for nitrogen fertiliser.

The proportion of spring barley grown for malting has fluctuated during the last five years (Table B1.6). The mean for the period 2002-2006 is 61%.

[12] Anon. (2000). *Fertiliser Recommendations for Agricultural and Horticultural Crops.* MAFF Reference Book 209 (Seventh edition). The Stationery Office, London..

Winter barley

During the five year period, overall total nitrogen use on winter barley has steadily decreased from year to year, finishing on 136 kg/ha in 2006 (mean: 145 kg/ha). The overall use of straight nitrogen has decreased from 132 kg/ha in 2002 to 118 kg/ha in 2006, despite a slight increase in 2005 (128 kg/ha) compared with the previous year. The overall compound nitrogen rate has shown a slight increase since 2005, ending just below the average for the period at 17 kg/ha in 2006.

Nitrogen requirements for winter barley, as with the spring sown crop, depend on a range of agronomic factors, including the intended market for the grain. Field average rates of nitrogen continued to decline on malting crops (-1 kg/ha) to 129 kg/ha and by 8 kg/ha to 144 kg/ha on non-malting crops in 2005 after the high levels of 2002 (Table B1.5).

The higher application rates of nitrogen (five-year mean of +14 kg/ha) on non-malting, compared to malting winter barley crops, reflect typical agronomic practice. The majority of winter barley crops (both feed and malting) are grown in England in arable rotations, usually after a previous cereal crop, when the soil nitrogen fertility status is low. Higher nitrogen rates are recommended for feed crops.

After two years without change in the relative crop area grown for malting, in 2006 there was a slight decrease to 30%, the lowest percentage in the period (Table B1.6).

Maincrop potatoes

Overall total nitrogen use on maincrop potatoes has fluctuated over the last five years. In 2006 it decreased by 24 kg/ha to 142 kg/ha, well below the five year mean of 154 kg/ha (Table B1.3). This decrease in 2006 appears to be partly due to a decrease in the average field rate (Table B1.4), as well as a decrease in the area receiving nitrogen fertiliser (97% in 2005 compared with 94% in 2006). Overall, most of the nitrogen input for maincrop potatoes is applied in compound form.

Oilseed rape

In 2006, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, decreased by 10 kg/ha to reach its lowest level since 2003 (191 kg/ha). The average field rate showed a similar fluctuation. The decrease was mainly due to a significant fall in the average field rate of straight nitrogen. Nevertheless, straight nitrogen continues to be the main source of nitrogen for the oilseed rape crop.

A more detailed breakdown of the data for oilseed rape (Table B1.7) shows that the average field rate of nitrogen on winter oilseed rape has decreased by 14 kg/ha between 2005 and 2006 (192 kg/ha), while that for the spring crop has increased by 10 kg/ha to 163 kg/ha. The five-year mean nitrogen rates were 205 kg/ha for winter oilseed rape, compared to 146 kg/ha for spring oilseed rape.

Table B1.7 Average field application rates of nitrogen (kg/ha) on winter and spring oilseed rape and estimated percentage distribution of crop areas, Great Britain 2002 – 2006

Total nitrogen (kg/ha)			Percentage distribution (%)		
	winter oilseed rape	*spring oilseed rape*		*winter oilseed rape*	*spring oilseed rape*
2002	207	137	*2002*	91	9
2003	206	141	*2003*	81	19
2004	211	136	*2004*	89	11
2005	206	153	*2005*	93	7
2006	192	163	*2006*	98	2

Good conditions for establishment in August and September 2005 resulted in the highest level of winter cropping for the period in 2006 (Table B1.7). The lowest area of winter crops (81%) occurred in 2003 and 2004. The high level of spring cropping in 2003 and 2004 was almost certainly due to the very dry conditions in the autumns of 2002 and 2003. Winter sown crops did not establish well and were often re-drilled with a spring crop.

Sugar beet

The overall nitrogen use on sugar beet increased considerably (+5 kg/ha) in 2006 to 99 kg/ha, which is also the mean for the five year period 2002-2006. Average field rates showed a similar increase in 2006 after four years of decreasing values, with a five year mean of 106 kg/ha. Most of the nitrogen input for sugar beet is applied as straight nitrogen.

B1.2.2 PHOSPHATE AND POTASH

Phosphate

The large decrease in overall phosphate use on tillage crops in 2006 reflects the decrease across all the major arable crops (Table B1.3). Overall phosphate use on cereals and oilseed rape decreased for the third year in succession, while for potatoes and sugar beet overall use returned to 2004 levels (122 and 35 kg/ha respectively) following a noticeable peak in 2005 (166 and 94 kg/ha respectively). Average field rates showed a similar pattern for most crops, apart from on winter wheat, where levels remained as in 2005, and on spring barley, where field rates increased slightly. The area receiving phosphate fertiliser has fluctuated throughout the five year period.

Overall phosphate rates for cereals in 2006 were: winter wheat 34 kg/ha, spring barley 39 kg/ha, and winter barley 37 kg/ha (Table B1.3). The rate for all three cereal crops was the lowest recorded value in the period 2002 to 2006. The average field rate for each cereal crop were 62, 54 and 59 kg/ha for winter wheat, spring barley and winter barley respectively. The rates for winter wheat and winter barley were the lowest for the five year period. The area receiving phosphate fertiliser remained lower for winter wheat (55%) and winter barley (63%) than for spring barley (73%), this is mainly due to the greater use of NPK compounds on the latter.

Following a peak of 153 kg/ha in 2005, the overall rate of phosphate on maincrop/second early potatoes decreased to 122 kg/ha. This is the lowest value for the five year period (mean: 131 kg/ha). The average field rate shows very similar annual variation (mean: 149 kg/ha). The area of maincrop potatoes receiving phosphate decreased slightly to 87% in 2006, after a five-year peak in 2005 (range: 86-91%).

For oilseed rape, the overall application rate of phosphate showed a significant decrease (-7 kg/ha) in 2006 to 34 kg/ha. This is the lowest use in the five-year period. The highest rate (50 kg/ha) occurred in 2002 and the mean for the period 2002-2006 was 40 kg/ha. The average field rate shows similar fluctuations. The area receiving phosphate fertiliser decreased to 57% for winter oilseed rape and 54% for spring oilseed rape, having been fairly static at around 63- 64% for the previous four years.

The recorded overall rate of phosphate on sugar beet decreased slightly in 2006 to 35 kg/ha (mean: 37 kg/ha). The lowest rate occurred in 2003. The average field rate shows similar fluctuations. There was little change in area receiving phosphate fertiliser at 50% (mean: 51%).

Potash

Overall potash use on tillage crops showed a slight decrease in 2006, mainly because overall use declined on all individual crops apart from spring barley. Average field rates showed a similar pattern, apart from on oilseed rape, where rates increased slightly. The area receiving potash fertiliser reduced in 2006 compared with the previous year for all crops.

The overall potash use on winter wheat and winter barley decreased to 41 and 54 kg/ha respectively (Table B1.3), while spring barley increased by 8 kg/ha to 60 kg/ha. The corresponding average field rates were slightly different in that winter wheat and spring barley increased to 75 and 76 kg/ha respectively, while winter barley decreased to 76 kg/ha (Table B1.4). The area receiving potash fertiliser was lower in 2006 than in the previous four years.

The overall potash rate on maincrop potatoes decreased in 2006 by 59 kg/ha to 197 kg/ha. There has been a great deal of fluctuation in overall rate during the period 2002-2006 (range: 197-256 kg/ha, mean: 215 kg/ha). The average field rate was relatively stable between 2002

and 2004 so for these years the fluctuations in overall rate appear to be due to changes in the area receiving potash fertiliser. However for 2005 and 2006 the average field rate has also shown large changes whilst the area receiving potash fertiliser was similar in both years

In 2006, potash use on oilseed rape decreased to 38 kg/ha for the overall rate, but increased slightly to 69 kg/ha for the average field rate. The highest overall potash use for the five-year period was 50 kg/ha in 2002 (mean: 44 kg/ha). The area receiving potash fertiliser was lower in 2006 than in the previous four years.

Overall rates of potash for sugar beet have fluctuated throughout the period 2002-2006 (Table 1.3), with the highest value (112 kg/ha) in 2005 and the lowest value (91 kg/ha) in 2003. The mean for the five-year period is 104 kg/ha. Fluctuations in overall rate are partly related to average field rate and partly with changes in the area receiving fertiliser. For example, the increase in overall rate in 2004 was associated with an increase in the average field rate of +5 kg/ha and by an increase in the dressing cover from 72% to 80%. In 2005 the increase was due to an increase in the average rate of +17 to 147 kg/ha (mean: 131 kg/ha).

Part of the reason for recent apparent fluctuations in estimates of nutrient application rates for sugar beet and potatoes may be because these crops are not always managed by the farmers themselves; it is recognised that information on the nutrient content of fertilisers applied by contractor is less reliably reported by farmers than for self-applied products.

B1.2.3 SULPHUR

The risk of sulphur deficiency in crops such as oilseed rape, cereals and intensively cut grass, which have a high sulphur requirement, has increased appreciably over the last decade. Sulphur reserves have become depleted in some soil types, particularly sandy and shallow soils, because of the continuing reduction in sulphur dioxide emissions from industrial sources and consequent decline in atmospheric deposition of sulphur over the last thirty years[13]. Sulphur application is now an essential agronomic requirement for susceptible crops grown in most parts of Great Britain.

The Survey has collected detailed information on sulphur fertiliser use since 1993, when only 3-6% of the cereal crop area and 8% of the oilseed rape area received an application of sulphur. By 1997, the proportions of these crop areas which were treated with sulphur had increased markedly to 13-14% for cereals and 30% for oilseed rape. Since then however, dressing covers for sulphur generally remained fairly static until 2002 when the areas increased. There have been further increases since then, with well over half the oilseed rape crop now being treated (Table B1.8).

Over the last five years the average application rate has fluctuated. For cereals the five year means are 52, 51 and 43 kg/ha for winter wheat, winter barley and spring barley respectively. The rates applied are generally higher than the recommended practice of 25-40 kg/ha SO_3, applied as a water soluble form in early spring, for potentially sulphur-deficient cereal crops. The rate for oilseed rape decreased considerably (-12 kg/ha) in 2006, and is now in line with the recommended practice of 50-75 kg/ha for oilseed rape[14]. This has followed a slight decrease in 2005, after the highest ever recorded rate (85 kg/ha) in 2004 (Table B1.8).

[13] McGrath S. P., Zhao F. J. and Blake-Kalff M. M. A. (2002). History and outlook for sulphur fertilisers in Europe. The *International Fertiliser Society Proceedings* **497**, *York* . ISBN 0 85310 133 7.

[14] Anon. (2000). *Fertiliser Recommendations for Agricultural and Horticultural Crops.* MAFF Reference Book 209 (Seventh edition). The Stationery Office, London..

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2002 – 2006

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2002	28	27	25	47
2003	30	35	27	54
2004	38	37	27	57
2005	41	34	32	59
2006	43	42	32	64

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2002	48	54	40	78
2003	53	53	48	74
2004	53	48	46	85
2005	55	52	41	82
2006	51	49	41	70

In general a higher proportion of cereal and oilseed crops are treated with sulphur in Scotland than in England & Wales (Table B1.9). This regional difference probably reflects the greater awareness of the risk of sulphur deficiency in Scotland, due to historically extremely low levels of atmospheric sulphur deposition, compared to most other areas of Britain. However, there is evidence in recent years that farmers in England & Wales are now more aware of the need to apply sulphur.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2002 – 2006

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2002*	27	22	20	43
	2003	29	34	27	55
	2004	37	35	25	57
	2005	41	33	31	59
	2006	42	41	32	63
Scotland*	*2002*	51	54	28	72
	2003	42	39	28	49
	2004	59	57	29	60
	2005	41	37	33	61
	2006	52	60	31	83

* Scottish data are apparently more variable due to smaller sample sizes.

B1.3 FERTILISER USE ON GRASSLAND

Overall fertiliser usage on grassland in Great Britain over the last five years, as previously shown in Tables B1.1 and B1.2, is summarised again in Table B1.10. The corresponding estimates of dressing cover and average field rates for each nutrient are shown in Table B1.11.

Table B1.10 Overall fertiliser use (kg/ha) on grassland, Great Britain 2002 – 2006

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2002	32	57	89	20	25
2003	31	53	83	18	22
2004	27	51	77	17	22
2005	28	47	74	16	20
2006	28	44	72	16	21

The 2 kg/ha drop in overall total nitrogen use on grassland in 2006 coincided with a 2% increase in the dressing cover (Table B1.11), which at 70% is the average for the five-year period.

The dressing cover for straight nitrogen showed a slight increase in 2006 compared with 2005 and 2004. However, the trend for average field rate is downwards. The area receiving compound nitrogen has fluctuated during the period, reaching 55% in 2006, (period mean: 56%). The average field rate for compound nitrogen has decreased over the five-year period, with the lowest rate for the period (80 kg/ha) occurring in 2006 (period mean: 89 kg/ha)

Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2002 – 2006

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2002	28	59	73	60	59
2003	27	56	70	57	57
2004	25	58	70	59	59
2005	26	54	68	55	55
2006	28	55	70	56	56

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2002	113	97	122	33	42
2003	114	94	119	31	39
2004	107	88	109	29	38
2005	107	87	109	29	37
2006	102	80	103	28	37

Average field rates for phosphate and potash were at their lowest level for the five year period in 2006, falling to 28 kg/ha for phosphate and remaining at 37 kg/ha for potash, compared with a mean for the period of 30 kg/ha and 39 kg/ha respectively. The dressing cover, which has varied throughout the last five years, increased very slightly in 2006 to 56% for both phosphate and potash (five year mean: 57% for both phosphate and potash).

B1.3.1 NITROGEN

The survey information collected for grassland fields enables nitrogen and other fertiliser nutrient usage to be assessed in more detail according to sward management practice.

Cutting and grazing management

Fertiliser requirements for grassland vary according to the type of livestock enterprise, intensity of production and the associated cutting and grazing regimes used for sward management. Fertiliser use on dairy, other livestock and mixed farms in England & Wales and in Scotland in 2006 are presented in Section C tables. The Survey estimates for annual distributions of the total grassland area between grazing and cutting management regimes since 2002 are summarised in Table B1.12. These should not be taken as authoritative national estimates of grassland utilisation, as the Survey is designed to estimate fertiliser application rates, not to derive accurate crop areas. Fertiliser usage for the different cutting and grazing categories is presented in Table B1.13. The differences in average field rates for each nutrient illustrate the influence of grassland management practice on fertiliser inputs.

Table B1.12 Grassland utilisation (% of grass area), Great Britain 2002 – 2006

	grazed [a]	*silage* [b]	*hay* [b]
2002	92	31	10
2003	93	29	10
2004	94	29	11
2005	93	28	13
2006	91	31	11

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion has decreased slightly since 2002.

[a] May also be cut.

[b] May also be grazed.

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2002 – 2006

Total nitrogen

	overall application rate				average field rate		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2002	85	133	72	*2002*	117	155	105
2003	81	130	69	*2003*	115	150	100
2004	75	121	61	*2004*	107	137	91
2005	74	124	52	*2005*	108	140	83
2006	72	113	53	*2006*	102	130	86

Straight nitrogen

	overall application rate				average field rate		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2002	31	44	29	*2002*	112	114	95
2003	29	43	31	*2003*	114	117	100
2004	26	40	27	*2004*	107	113	92
2005	27	40	20	*2005*	107	111	90
2006	28	44	23	*2006*	102	108	81

Compound nitrogen

	overall application rate				average field rate		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2002	55	89	43	*2002*	93	124	85
2003	51	87	38	*2003*	91	117	76
2004	49	81	34	*2004*	85	107	72
2005	46	84	32	*2005*	86	114	68
2006	44	70	30	*2006*	79	100	70

During the period 2002-2006, even though overall total nitrogen rates for the silage and hay categories have fluctuated slightly, all grass categories have shown a net decrease. The changes in overall application rate of total nitrogen appear to be mainly due to the changes in the average field rate. In 2006, 71% of grazed grass, 87% of silage and 62% of hay received nitrogen.

Following a decline in the overall use of straight nitrogen on all grass categories over the previous five years, 2006 saw a slight increase. The rates for hay are the most variable, but still show a net decline over the period. Compound nitrogen inputs have fluctuated during the last five years, but ended on a five-year low for all categories of management. The five year means for the overall compound nitrogen rate are 49, 82 and 35 kg/ha for grazed grass, silage and hay respectively.

The fall in nitrogen use on grassland throughout the period can be attributed to decreases in livestock numbers which has reduced herbage production requirements.

[a] May also be cut.

[b] May also be grazed.

B1.3.2 PHOSPHATE AND POTASH

Phosphate and potash requirements for grassland depend, as for nitrogen, on the sward management system.

Table B1.14 Phosphate and potash use (kg/ha) by grassland utilisation, Great Britain 2002 – 2006

Total phosphate

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2002	19	30	20	*2002*	32	42	37
2003	17	27	16	*2003*	30	37	31
2004	17	26	14	*2004*	29	36	29
2005	16	25	14	*2005*	28	35	28
2006	15	24	15	*2006*	27	35	30

Total potash

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2002	23	47	24	*2002*	40	63	44
2003	21	43	18	*2003*	37	57	36
2004	21	42	18	*2004*	36	53	36
2005	19	40	17	*2005*	35	51	34
2006	20	38	16	*2006*	35	52	34

Overall phosphate rates declined over the period 2002-2006 (Table B1.14). In 2006 the rates of 15 and 24 kg/ha for grazed grass and silage respectively were the lowest for the period. The corresponding five-year means for grazed grass, silage and hay were 17, 26 and 16 kg/ha respectively. Average field rates showed a similar pattern. Grass cut for silage is more likely to receive phosphate (70% in 2006) than grazed grass (57%) or hay (48%).

Like phosphate, overall potash rates have declined between 2002 and 2006. Overall rates in 2006 were the lowest for the period. Five year means were 21, 42 and 19 kg/ha for grazed grass, silage and hay respectively. The biggest decline has occurred with silage and hay. Average field rates show a similar trend. Grass cut for silage is more likely to receive potash (74% in 2006) than grazed grass (56%) or hay (48%).

Most phosphate and potash fertiliser inputs on grassland are applied in some form of NPK compound (Section C).

[a] May also be cut.

[b] May also be grazed.

B1.3.3 SULPHUR

The risk of sulphur deficiency is increasing[15]. In grassland it can cause loss of herbage yield. Quality is also affected because sulphur deficiency causes a widening of the N:S ratio in grassland which results in a reduction in digestibility for ruminants. The risk is greatest where grassland is cut intensively for silage, and is less likely where swards are used mainly for grazing or single hay cuts. Potential yield losses of silage due to sulphur deficiency on coarse textured or shallow soils in low sulphur deposition areas are most likely to occur in second and subsequent cuts, rather than first cut, unless the deficiency is very severe. The Survey data confirm that, as expected, a higher proportion of grassland cut for silage is treated with sulphur compared to grazed grass or grass cut for hay (Table B1.15). Estimated dressing covers have fluctuated in the past five years, but have increased most notably on silage in 2006. The total area of grass treated in 2006 (8%) was the highest in the period and represents a 6% increase from the value recorded in 1993, when information on sulphur applications was first collected in the Survey.

The significant proportion of heavier textured soil types which occur in the main grassland farming areas, and assumed inputs of sulphur from slurry applications to silage fields, are among possible reasons for the current low level of sulphur fertiliser use on grassland. Insufficient farmer awareness about the risks of sulphur deficiency in cut grass, particularly for second cut silage, may also be a contributory but decreasing factor.

Table B1.15 Sulphur use on grassland, Great Britain 2002 – 2006

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2002	5	12	4	6
2003	4	10	6	5
2004	5	10	5	6
2005	5	11	6	6
2006	7	14	4	7

Average application rate per year (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2002	42	48	57	44
2003	37	44	44	40
2004	36	37	29	38
2005	34	39	47	37
2006	38	35	23	38

Estimated average field rates of sulphur application for each sward management category have shown a net decrease between 2002 and 2006, with five year means of 37, 41 and 40 kg/ha SO_3 for grazed, silage and hay grassland, respectively (Table B1.15). Note that the average application rates in Table B1.15 are annual totals, not rates per cut. The recommended rate for silage grass is 40 kg/ha SO_3 for each susceptible cut.

[15] McGrath S. P., Zhao F. J. and Blake-Kalff M. M. A. (2002). History and outlook for sulphur fertilisers in Europe. *International Fertiliser Society Proceedings* **497**, York. ISBN 0 85310 133 7.

[a] May also be cut.

[b] May also be grazed.

B2 LONGER TERM TRENDS

B2.1 LONGER TERM TRENDS FOR GREAT BRITAIN

The British Survey of Fertiliser Practice was first undertaken as an integrated British survey in 1992. Before then, the annual Survey of Fertiliser Practice had been carried out separately for England & Wales and for Scotland. Survey statistics from those earlier surveys have, however, been collated in order to report an aggregated series for total nitrogen, phosphate and potash use on tillage crops and grassland in Great Britain since 1983, when the survey in Scotland started. Data series are also presented in this section for England & Wales, starting from 1969 when the present design of the survey was first used, and for Scotland, beginning in 1983. The aggregated data for Great Britain follow a similar pattern to that observed for England & Wales, because a large proportion of both the tillage and grassland areas in Britain is located in England & Wales.

B2.1.1 NITROGEN USE

Table B2.1 Total overall nitrogen application rates (kg/ha), Great Britain 1983 – 2006

	tillage crops	*grass*	*all crops and grass*
1983	149	126	136
1984	157	131	143
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	113	128
1997	149	123	136
1998	144	109	126
1999	141	110	125
2000	149	99	123
2001	145	94	116
2002	150	89	117
2003	149	83	113
2004	152	77	110
2005	150	74	109
2006	147	72	107

Overall total nitrogen rates for tillage crops and grassland in Great Britain since 1983 are summarised in Table B2.1 and presented graphically in Figure B2.1(a). Overall nitrogen use has been consistently higher on tillage crops than on grassland ever since the British survey started.

The maximum overall rate of nitrogen on tillage crops was recorded in the mid 1980s, at 157 kg/ha. Overall nitrogen use dropped in 1988 and, since then, has remained at a lower level with annual rates mostly in the range 145-149 kg/ha. However, larger fluctuations in overall nitrogen rates were recorded in both 1991, when there was a temporary increase to 151 kg/ha, and in 1993, when the application rate fell sharply to 137 kg/ha. Overall nitrogen use showed another smaller drop in 1998-99, before reaching a level of 149 kg/ha in 2000. The 152 kg/ha rate in 2004 was the highest since 1987. The downward shift in total nitrogen use on tillage crops during the 1980s and 1990s was caused by the combined effects of changes in:

(i) the relative cropping areas of the major arable crops, as influenced by seasonal weather and market economic factors,
(ii) the widespread introduction of set-aside in 1993,
(iii) the nitrogen application rates for particular crops (see Figure B2.2 (a)).

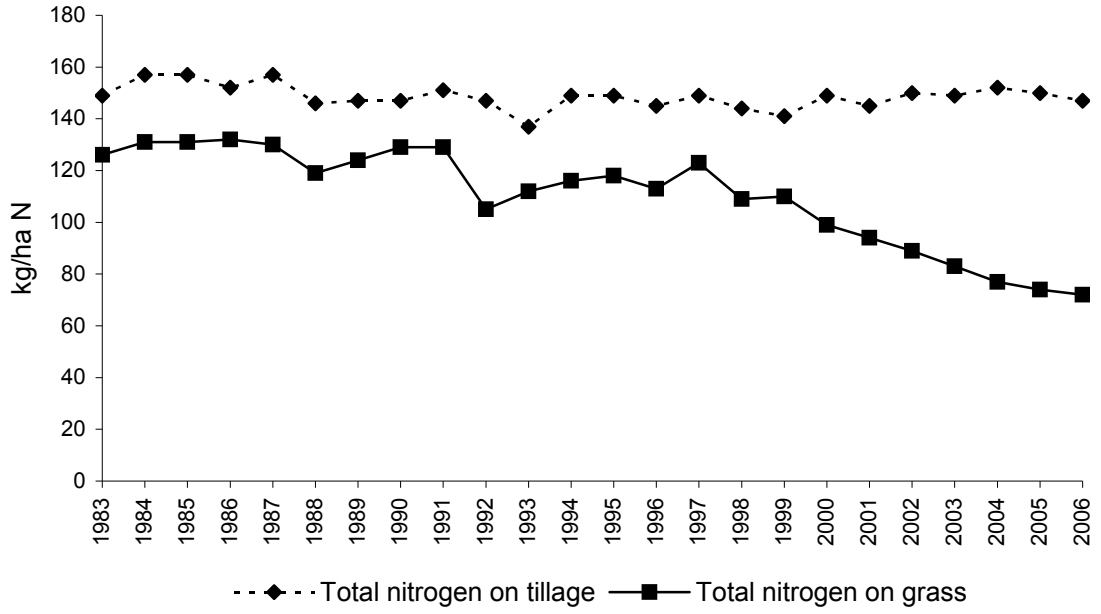
Most of the total nitrogen fertiliser used on tillage crops each year has, since 1983, been applied in straight form.

Overall nitrogen use on grassland also peaked in the mid 1980s, at around 131 kg/ha, and then dropped very sharply to 119 kg/ha in 1988 before largely recovering over the following three years. Subsequent nitrogen use has, however, declined as a result of the net effects of a very significant drop in overall application rate in 1992 and, despite some recovery over the following five years, further falls occurred in 1998 through to 2006. The overall nitrogen rate of 72 kg/ha on grassland in 2006 was the lowest rate recorded so far in the British survey and, over a longer timescale, this level of nitrogen use had not been observed in England & Wales since the early 1970s (see Figure B2.3 (a)).

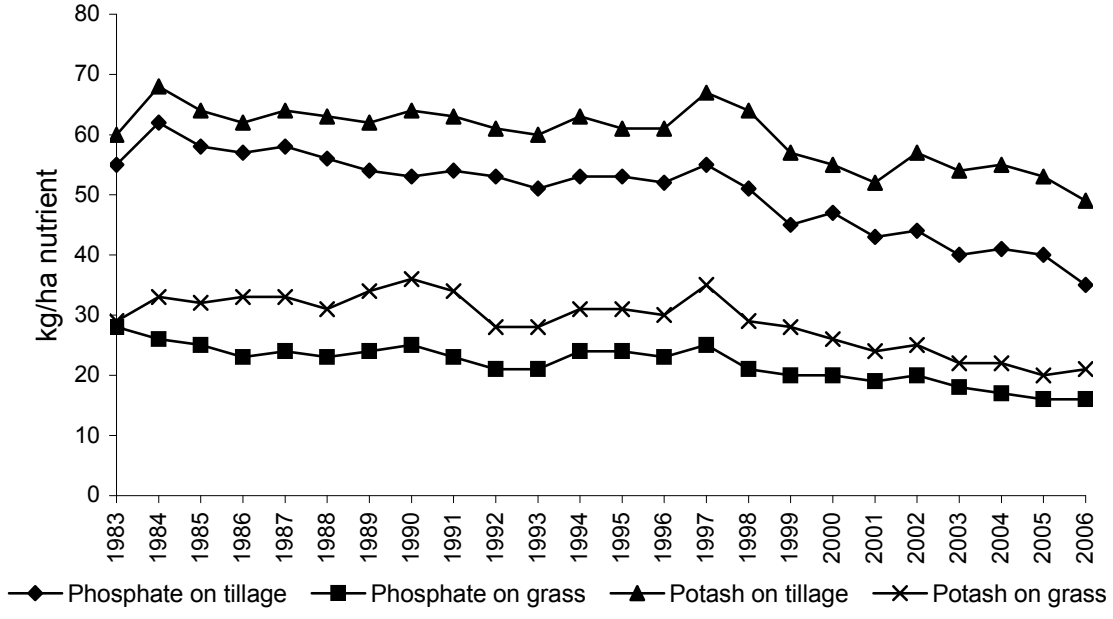
Overall nitrogen use on all crops and grassland, as a single category averaged at 142 kg/ha (peak 144 kg/ha) in the first five years (1983-1987) of the Great Britain data set. The means for each of the subsequent five year periods are 1988-92: 134 kg/ha, 1993-1997: 130 kg/ha, 1998-2002: 121 kg/ha and 2003-to date: 109 kg/ha, reflecting the downward trend observed on both grassland and, to a lesser extent, on tillage crops (Table B 2.1).

Figure B2.1 **Overall application rates (kg/ha) of (a) total nitrogen and (b) phosphate and potash on tillage crops and grassland, Great Britain 1983 – 2006**

(a)



(b)



B2.1.2 PHOSPHATE AND POTASH USE

Annual overall rates of phosphate and potash on tillage crops and on grassland since 1983 are illustrated in Figure B2.1(b), using the data presented in Table B2.2. Overall rates of phosphate and potash applied to tillage crops were approximately double those used on grassland.

Table B2.2 Overall phosphate and potash application rates (kg/ha), Great Britain 1983 – 2006

	tillage crops		*grass*		*all crops and grass*	
	phosphate	*potash*	*phosphate*	*potash*	*phosphate*	*potash*
1983	55	60	28	29	40	43
1984	62	68	26	33	42	49
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
1997	55	67	25	35	39	50
1998	51	64	21	29	35	46
1999	45	57	20	28	32	42
2000	47	55	20	26	32	40
2001	43	52	19	24	29	37
2002	44	57	20	25	31	40
2003	40	54	16	22	28	36
2004	41	55	17	22	28	37
2005	40	53	16	20	27	35
2006	35	49	16	21	25	34

Overall phosphate use on tillage crops had gradually declined over the period since 1983, from a five-year mean of 58 kg/ha in 1983-87, 54 kg/ha in 1988-1992, 53 kg/ha in 1993-97 to 46 kg/ha for the period 1998-2002. The 2006 rate of 35 kg/ha is the lowest rate recorded since Great Britain records began in 1983.

The overall rate of phosphate on grassland was highest in 1983, at 28 kg/ha, and then application remained relatively stable at 23-25 kg/ha between 1985 and 1997, apart from a temporary recorded drop to 21 kg/ha in 1992-93. However, overall phosphate use has decreased gradually since 1997 to a level of 16 kg/ha in both 2005 and 2006, the lowest recorded since 1983. The five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-1992, 23 kg/ha in 1993-97, 20 kg/ha in 1998-2002 and 17 kg/ha for the period 2003-06.

Overall potash use on tillage crops had declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1998-1992, and 62 kg/ha in 1993-1997. There was a larger drop to 57 kg/ha for the period 1998-2002. The overall application rate appeared to recover in 1997, but then dropped each year to a low of 52 kg/ha in 2001. Between 2002 and

2005, overall potash use on tillage crops recovered to a four-year mean of 55 kg/ha, but in 2006 dropped to 49 kg/ha; the lowest level recorded since 1983. This represents a 28% fall from the peak value of 68 kg/ha in 1984.

The pattern of overall potash use on grassland has been more variable, compared to tillage crops, but has also shown a net decline between 1983 and 2006. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases in 1989-91 and in 1997. Annual potash use between 1998-2002 was consistently lower than in earlier years (mean: 26 kg/ha) and the value of 21 kg/ha in 2006 is only slightly higher than the 20 kg/ha recorded in 2005: the lowest value since 1983.

B2.1.3 FERTILISER USE ON MAJOR TILLAGE CROPS

Overall application rates of total nitrogen, phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.2.

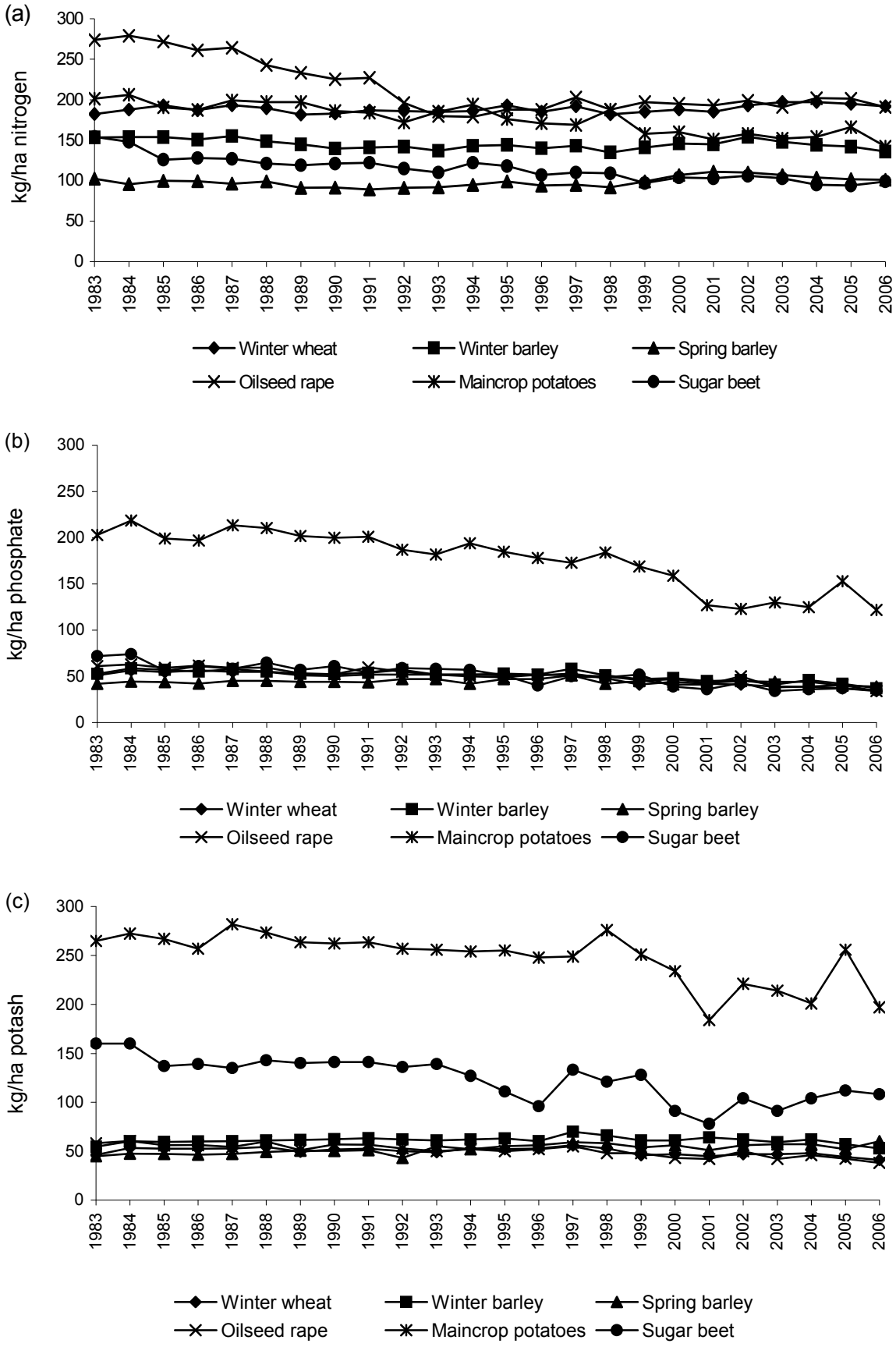
Nitrogen

Between 1983-87 the five year mean for winter wheat was 189 kg/ha. Over the following five years it declined to 185 kg/ha, increasing to 188 kg/ha for the period 1993 to 1997 and dropping slightly to 187 kg/ha in 1998-2002. The rates of 197 kg/ha in 2003 and 2004 (Figure B2.2(a)) are the highest recorded since 1983. For winter barley the mean since 1988 has settled at about 10 kg/ha less than the peak of 153 kg/ha in 1983-87. For spring barley the mean for the 1998-2002 five year period at 104 kg/ha is higher than each of the previous five years cycles (99, 92 and 95 kg/ha) and the values in the new millennium are the highest since records started in 1983.

Nitrogen use on oilseed rape decreased between 1984 and 1994 and then showed a slight recovery. Before 1992, this change was mainly caused by reductions in autumn-applied nitrogen, as a result of cutbacks in both area treated and average rate. Between 1992 and 1994 the decreases in total nitrogen use resulted from reduced autumn and spring nitrogen recommendations for oilseed rape. This reflected economic change associated with the introduction of Arable Area Payments, and a temporary increase in the proportion of spring-sown crops, which have a lower nitrogen requirement than winter oilseed rape. After reaching a low of 179 kg/ha in 1994 rates have tended to fluctuate between 188 kg/ha and 203 kg/ha: mean usage for the period 1993-1997 was 188 kg/ha compared with 194 kg/ha for 1998-2002. The value of 191 kg/ha in 2006 is within the range for the past ten years, but below the five-year mean.

Since the early 1980s, overall nitrogen use on maincrop potatoes has tended to decrease, despite some large variability in estimated annual rates; mean usage was 197, 187, 179 and 163 kg/ha for the periods 1983-1987, 1988-1992, 1993-1997 and 1998-2002 respectively. Sugar beet has also experienced a decline (137, 120 113 and 104 kg/ha) over the same periods. Mean rates of 154 kg/ha for maincrop potatoes and 98 kg/ha for sugar beet for 2003-2006 continue the decline. The trend towards less nitrogen use on sugar beet reflects industry and farmer awareness about the adverse effects of unnecessarily high nitrogen input on sugar yield, related to the formation of high concentrations of amino-nitrogen compounds in the roots.

Figure B2.2 **Overall application rates (kg/ha) of (a) total nitrogen and (b) phosphate and (c) potash on major arable crops, Great Britain 1983 – 2006**



Phosphate and potash

Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.2(b)); the mean for the five year period 1998-2002 showed a drop to below 50 kg/ha for the first time in both crops (43 kg/ha for winter wheat and 47 kg/ha for winter barley). This downward trend has continued with a fall to 37 and 42 kg/ha for winter wheat and winter barley respectively for the 2003-2006 period. In contrast however, phosphate use has risen slightly on spring barley between 1983 and 1997, but has declined since then. Overall phosphate use has also declined on oilseed rape, maincrop potatoes and sugar beet with means for 1983-87 of 61, 206 and 64 kg/ha respectively declining to 46, 152 and 44 in 1998-2002, and rates have continued to decline in 2003-2006.

On winter wheat the mean overall potash rates were very similar for the five year periods 1983-87, 1988-92 and 1993-97 at 52, 52 and 53 kg/ha respectively but there was a reduction to 48 kg/ha in 1998-2002. For barley the same periods have seen an increase in potash use from 59 kg/ha (winter barley) and 47 kg/ha (spring barley) in 1983-87 to 63 and 55 kg/ha in 1998-2002. The corresponding means for oilseed rape, maincrop potatoes and sugar beet show decreases from 57, 269 and 146 kg/ha in 1983-1987 to levels of 46, 230 and 102 kg/ha for the 1998-2002 period. Rates in 2003-2006 suggest the downward trend may be continuing (mean: 42, 217, 104 kg/ha).

Much of the reduction in the overall rates of application of phosphate and potash to combinable arable crops results more from a decrease in the dressing cover than from a reduction in the average application rates.

B2.1.4 AUTUMN AND WINTER APPLICATIONS OF NITROGEN FERTILISER

In 1985 about two thirds of the winter cereals and nearly 90% of winter oilseed rape received autumn and early winter nitrogen. Since that time the area has decreased considerably in England & Wales and to a lesser extent in Scotland. For cereals in England & Wales the dressing cover is now 5% (Table B2.3). In Scotland in the past two year there has been a large reduction to less than 30% on both crops for the first time. The Great Britain values have now fallen below 10% for both crops. This reduction is in keeping with the standard advice that autumn nitrogen is not required for winter cereals, as economic yield benefits are rare and autumn-applied nitrogen is vulnerable to leaching loss. In Scotland some farmers still consider that autumn-applied nitrogen reduces the risk of poor establishment of winter cereal crops under the colder and wetter conditions in that part of Britain. The area receiving autumn nitrogen is now too low for data relating to average field application to be used.

In England & Wales the proportion of winter oilseed rape dressed with autumn-winter applied nitrogen fell rapidly between 1985 and 1989 down to about a half, but showed little further change until 1997/98, when it dropped to one third of the crop area. The proportion in Scotland is higher although with the low number of fields in the sample the values for 2001 onwards should be treated with caution. The average field rate for England & Wales was 49 kg/ha in 1985-89, 43 kg/ha in 1990-94, 38 kg/ha in 1995-99 and 44 kg/ha in 2000-04. Autumn nitrogen at 30 kg/ha is recommended for winter oilseed rape, unless the soil has a high nitrogen fertility, as the crop normally requires more nitrogen than winter cereals during the autumn growth period. However, the economic benefits are usually small and this is reflected in current fertiliser practice.

The survey results may be taken to indicate the implementation of good agronomic and environmental practice by arable farmers in response to their awareness of research findings and advisory recommendations.

Table B2.3 **Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape by region, 1999 – 2006 and average application rate (kg/ha) for winter oilseed rape**

Winter cereals - dressing cover

	England & Wales		*Scotland*		*Great Britain*	
	winter wheat	*winter barley*	*winter wheat*	*winter barley*	*winter wheat*	*winter barley*
1999	5	6	35	54	6	10
2000	6	6	35	45	7	11
2001	5	5	32	64	7	14
2002	5	8	38	64	8	16
2003	4	4	20	46	5	9
2004	4	4	35	54	6	9
2005	3	2	16	51	4	9
2006	5	5	14	22	5	7

Winter oilseed rape – dressing cover and application rate

	England & Wales		*Scotland* [a]		*Great Britain*	
	dressing cover	*application rate*	*dressing cover*	*application rate*	*dressing cover*	*application rate*
1999	32	42	72	45	35	43
2000	36	43	55	38	33	42
2001	36	44	91	39	43	43
2002	37	51	80	31	41	47
2003	36	40	87	37	42	39
2004	32	41	78	35	35	40
2005	38	42	86	37	42	41
2006	24	35	72	33	28	35

[a] Only a small number of fields in the sample.

B2.2 LONGER TERM TRENDS FOR ENGLAND & WALES

The earlier surveys for England & Wales, which together now account for around 83% (8.6 million ha) of the agricultural land in Britain, provide a longer time series than for Great Britain, based on the present survey design.

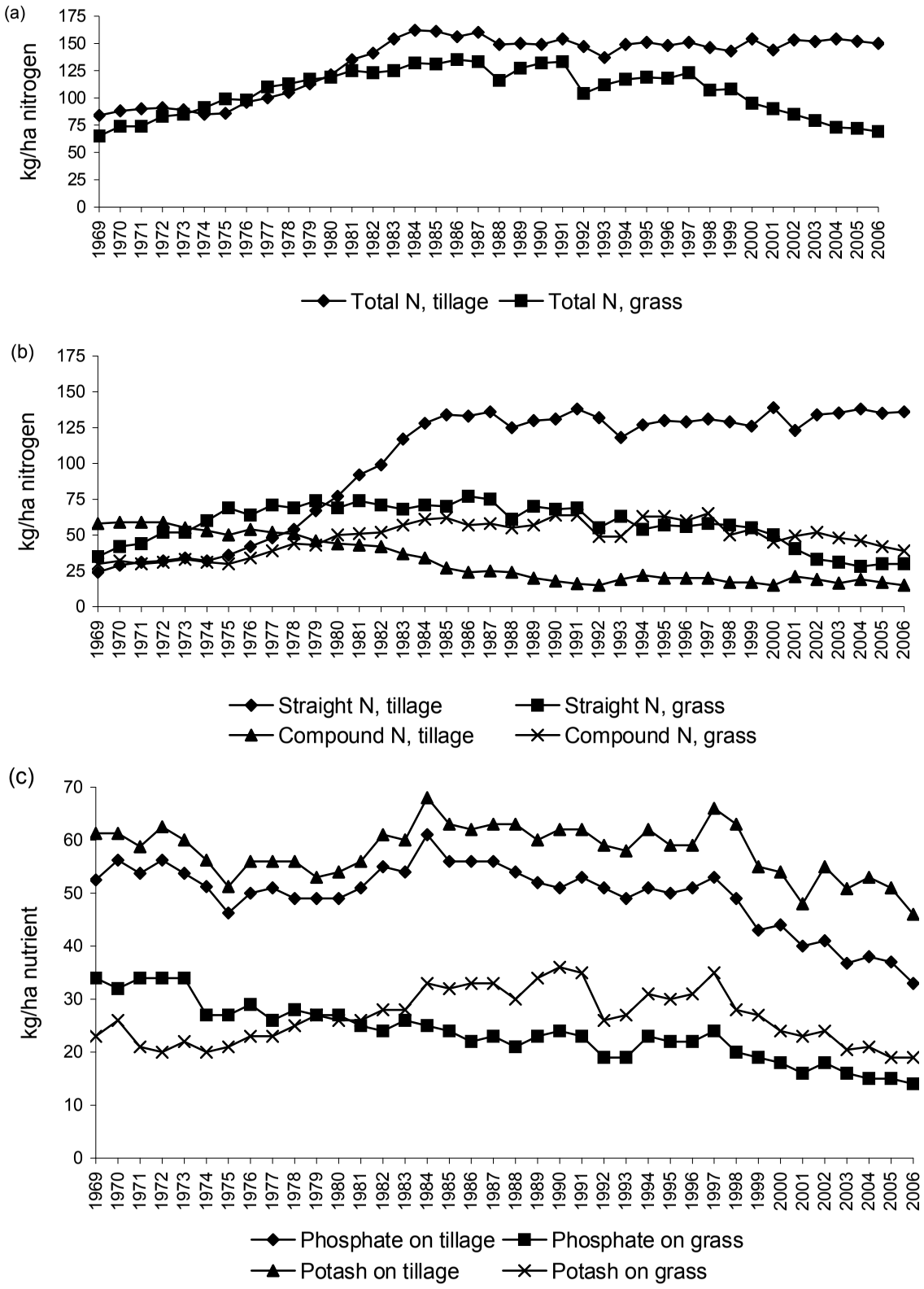
B2.2.1 NITROGEN USE

The falls in nitrogen use on tillage crops (Figure B2.3(a)) in the 1988, 1999 and 2001 seasons can be largely attributed to the reduced cropping areas of winter cereal and winter oilseed rape due, except for oilseed rape in 1999, to very wet autumns which restricted drilling opportunities. For example, in England in 2001 there was a 46% increase in the area of spring barley grown compared with the previous season. The large drop in nitrogen use on tillage crops in 1993 also resulted from a fall in the proportion of the total tillage area cropped with cereals and oilseed rape. This was caused by the introduction of the Arable Area Payment Scheme (AAPS) and widespread adoption of rotational set-aside on arable farms. This scheme halved the commodity price for oilseed rape, thereby reducing the optimum economic fertiliser nitrogen rate for this crop. A big increase in spring instead of winter oilseed rape cropping, in response to rape seed price reductions under the AAPS, was a further contributory factor to the drop in nitrogen use on tillage crops in 1993.

The sharp drop in nitrogen use on grassland in both 1988 and 1992 may have partly reflected the influence of seasonal weather patterns on grass growth and related nitrogen requirements. The increased use of fertiliser nitrogen on grassland during the 1980s had been accentuated by its high cost/benefit ratio, its reliability in producing a consistent response and its potential to support high stocking rates and high output. Nitrogen recommendations for grassland were reduced in the early 1990s, in light of further research findings, which could also partly account for the lower use of nitrogen in recent years. The further large fall in nitrogen use, which started in 1998, is associated with an ongoing reduction in livestock numbers, especially in the dairy sector. Increasing use of extended grazing practice on dairy farms, with consequently smaller silage requirements for winter feeding, may also have been a contributory factor to the reduction in nitrogen use on grassland. In 2001 Foot and Mouth had a major impact on livestock numbers. The North, West and South West were particularly badly affected. There was an average of a 10% reduction in the dressing cover in these areas with a 5% reduction for England & Wales as a whole compared with the previous year. Nitrogen application rates to grass in 2006 were the lowest since the early 1970s and are probably related to the ongoing reduction in the dairy herd (numbers in England have fallen by 6% since 2004).

Most nitrogen fertiliser on tillage crops in England & Wales is now applied in straight form, following the large steady increase in straight nitrogen application rate which occurred between 1975 and 1985, combined with a decrease in compound nitrogen use between 1970 and 1992 (Figure B2.3(b)). The use of straight nitrogen has largely determined the changes in total nitrogen rate on tillage crops since 1969. On grassland however, use of compound nitrogen increased between 1975 and 1990, while straight nitrogen use remained fairly static. Since 1998, use of straight N on grass has declined and in 2004, at 28 kg/ha, was the lowest level since current records began in 1969. Since 2004, levels have stabilised at 30 kg/ha.

Figure B2.3 **Overall application rates (kg/ha) of (a) total nitrogen, (b) straight and compound nitrogen and (c) phosphate and potash on tillage crops and grassland, England & Wales 1969 – 2006**



B2.2.2 PHOSPHATE AND POTASH USE

Overall application rates of phosphate and potash on tillage crops have shown a broadly similar pattern of annual changes in use over the last thirty years (Figure B2.3.(c)). The mean rates for phosphate were 52, 54, and 50 kg/ha during the 1970s, 1980s and 1990s. For potash, the equivalent figures were 57, 61 and 61 kg/ha. The falls in overall phosphate and potash use over the last six years mean that in 2006 application rates were at the lowest recorded levels since 1969.

Overall phosphate use on grassland slowly but steadily declined from 34 kg/ha in 1969, to 19 kg/ha in 1992, then recovered slightly before dropping back to 19 kg/ha in 1999. Levels continued to decline into the 2000s, and at 14 kg/ha, reached their lowest recorded level in 2006. The mean rates for phosphate were 30, 24, and 22 kg/ha during the 1970s, 1980s and 1990s, and 16 kg/ha over the last six years.

Insoluble phosphate fertilisers, such as basic slag or ground rock phosphate, were still commonly used on grassland in the early 1970s, at application rates which may have supplied relatively large amounts of total phosphate. Since then, phosphate inputs have been largely based on fertiliser products containing water soluble phosphate, which may partly explain the decline observed in the overall application rate.

In contrast, the overall rate of potash on grassland gradually increased with a mean rate of 23, 30 and 31 kg/ha during the 1970s, 1980s and 1990s. Rates have declined in the 2000s with the mean for the first seven years at 21 kg/ha.

B2.3 LONGER TERM TRENDS FOR SCOTLAND

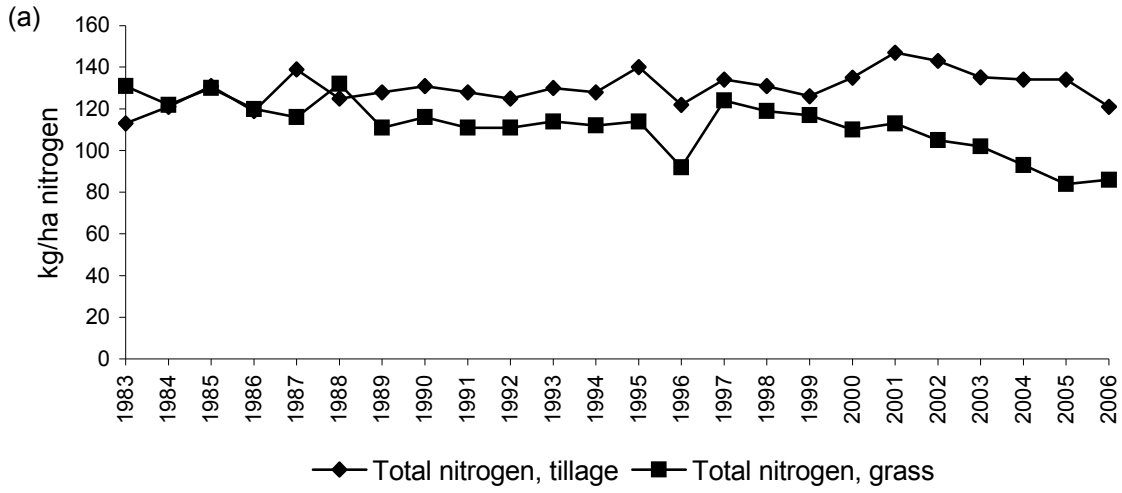
Overall rates for total nitrogen, phosphate and potash use on tillage crops and on grassland since 1983, the first year that the Survey was undertaken in Scotland, are presented in Figure B2.4. The trends differ from those for England & Wales over the same timescale.

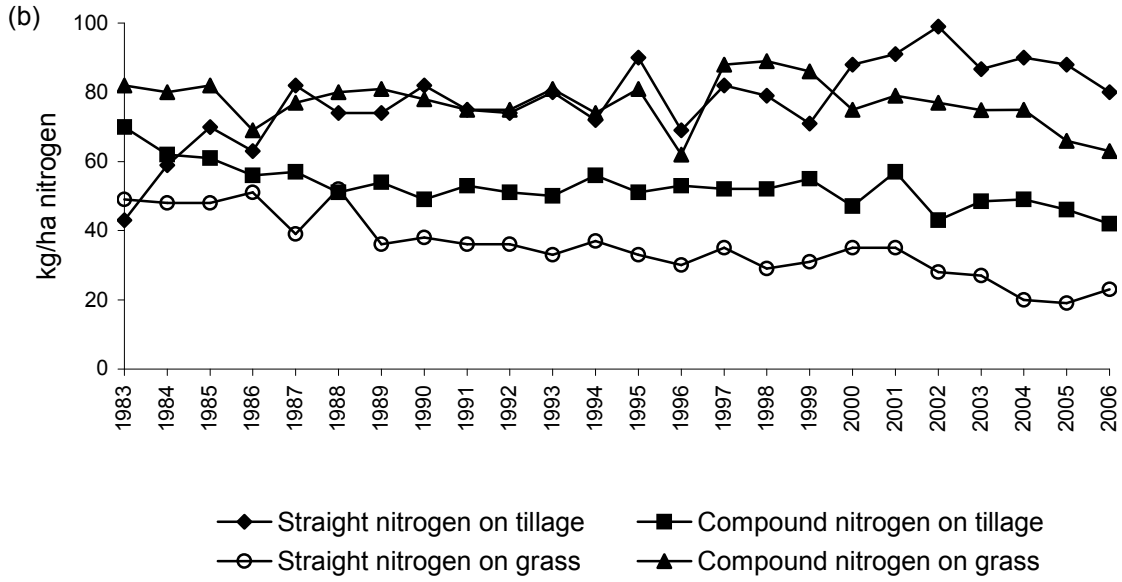
B2.3.1 NITROGEN USE

Recorded annual overall rates of total nitrogen on both grass and tillage crops in Scotland tended to fluctuate during 1983-88 and 1995-2001, but were relatively stable in the intervening years (Figure B 2.4 (a)). Since 2001 rates have declined. Total nitrogen rates on tillage crops in Scotland were much lower than those in England & Wales during the 1980s. This was largely because of differences in cropping practice and associated nitrogen requirement; malting spring barley and mixed rotations are more common in Scotland than in England & Wales, where winter wheat and oilseed rape are grown on a much higher proportion of the total tillage area. However, during the 2000s there has been a change to more winter barley at the expense of spring and this is now reflected in the nitrogen inputs as the rates in Scotland have increased relative to those in England. In 2001 the rate of 147 kg/ha was the highest level since records began in 1983 and was greater than the rate used in England & Wales (Figure B2.5(a)).

Before 1985, more nitrogen was applied to tillage crops in compound than in straight form (Figure B2.4(b)). Subsequently, about 60-65% of the total nitrogen input for tillage crops has been applied in straight form. In 2002 this increased temporarily to 70%; the corresponding proportion in England & Wales is nearly 90%. Compound nitrogen has consistently been the main form of nitrogen fertiliser used on grassland, with relatively little change in application rate since 1983, apart from a marked drop in 1996 and higher recorded usage in 1997-99, compared to earlier years. Straight nitrogen use on grass has decreased since the late 1980s, and reached its lowest value in 2005. In 2006 it recovered slightly to 23 kg/ha, but still represents only about one quarter of the total nitrogen input on grassland.

Figure B2.4 **Overall application rates (kg/ha) of (a) total nitrogen, (b) straight and compound nitrogen, and (c) phosphate and potash on tillage crops and grassland, Scotland 1983 – 2006**





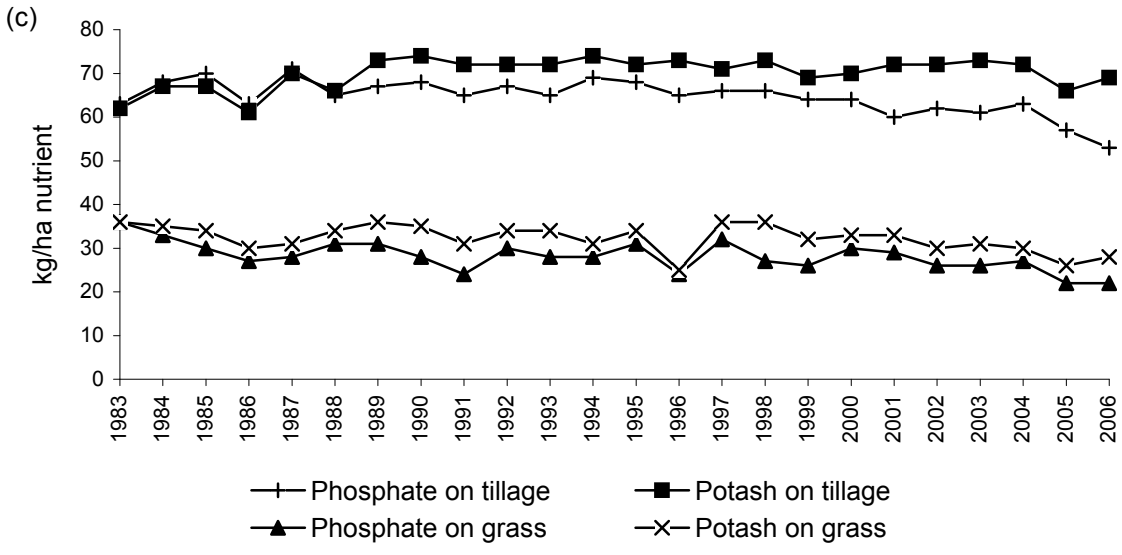
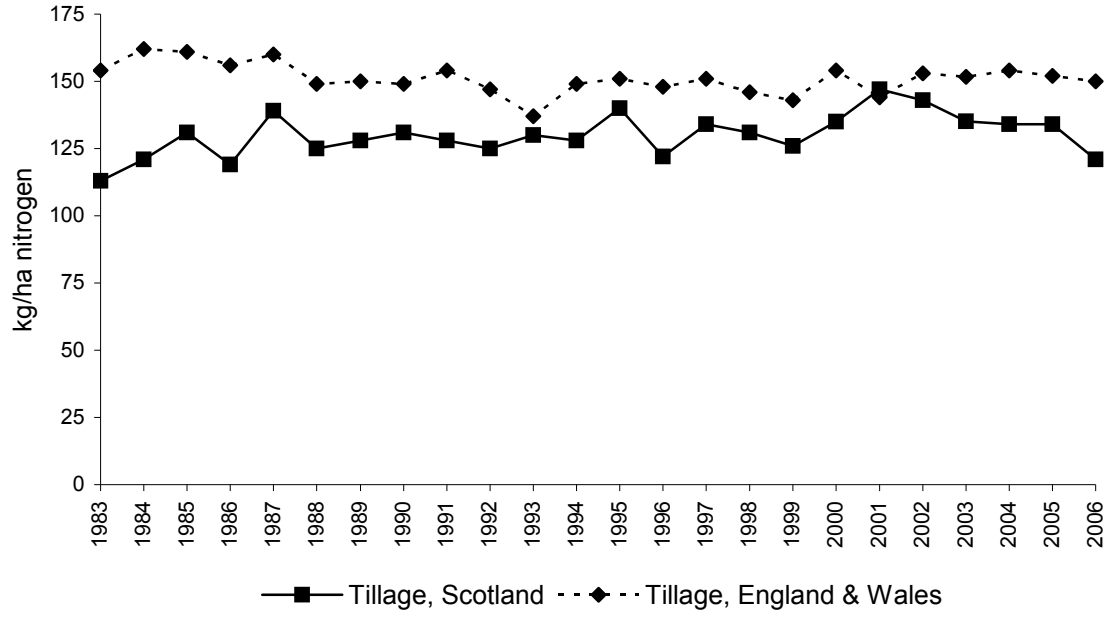
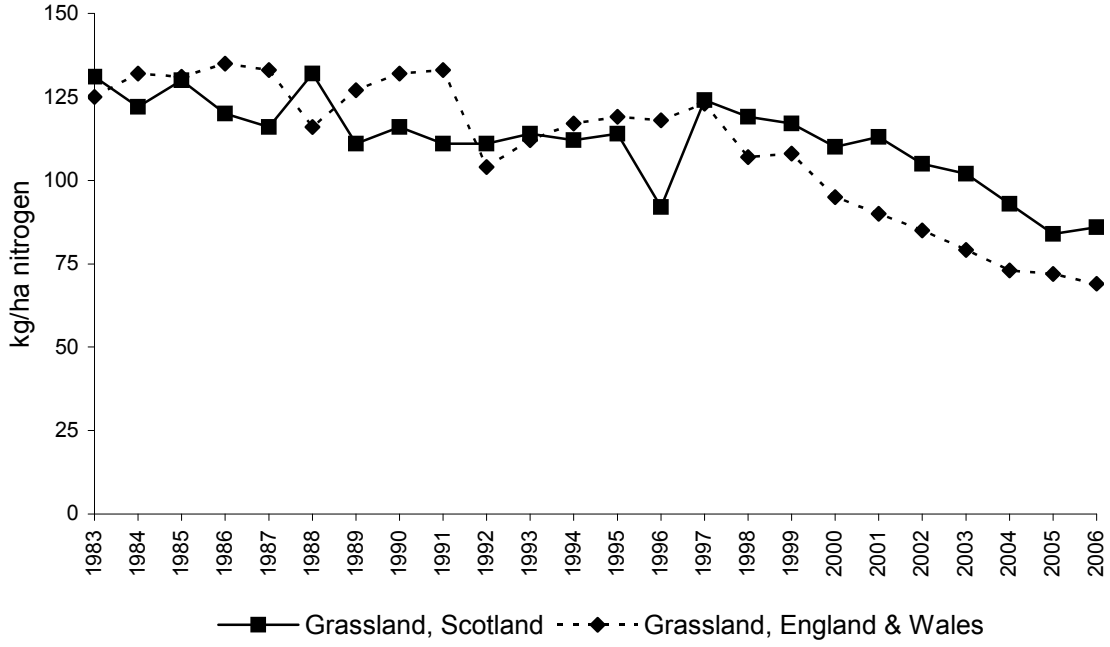


Figure B2.5 **Overall application rates (kg/ha) of (a) total nitrogen to tillage crops, and (b) total nitrogen to grassland in Scotland and in England & Wales 1983-2006**

(a)



(b)



B2.3.2 PHOSPHATE AND POTASH USE

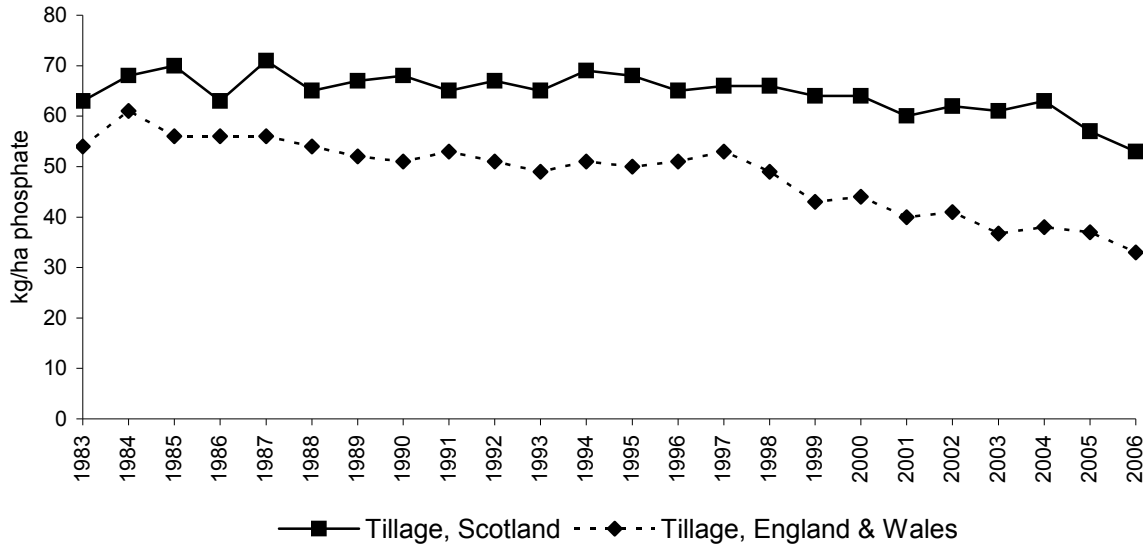
Overall rates of phosphate and potash on tillage crops tended to fluctuate between 1983 and 1988, but have been relatively stable between 1989 and 2000 (Figure B2.4(c)). Since 2000, phosphate has had a net decline, while potash levels have remained stable, with an average of 60 kg/ha for phosphate and 71 kg/ha for potash.

Overall application rates of phosphate to tillage crops are higher in Scotland (Figure B2.6(a)) and the difference has increased over the last six years as rates have fallen significantly in England & Wales. Potash rates were very similar in both countries between 1983-88 (Figure B2.6(b)). Between 1989 and 1996 about 10 kg/ha more potash was applied in Scotland. As with phosphate this difference has increased in recent years as rates in England & Wales have declined.

Overall rates of phosphate and potash on grassland declined from 1983 to 1986. Since then, rates have fluctuated from year to year but the average has remained fairly static at around 28 kg/ha for phosphate and 32 kg/ha for potash. Phosphate applications to grass in England & Wales have been consistently lower (Figure B2.7(a)). For grassland, rates of potash were generally similar until 1997, but rates in 1998 dropped further in England & Wales than they did in Scotland. Since then, rates in England & Wales have declined at a similar rate to those in Scotland (Figure B2.7(b)).

Figure B2.6 **Overall application rates (kg/ha) of (a) phosphate and (b) potash to tillage crops in Scotland and in England & Wales 1983-2006**

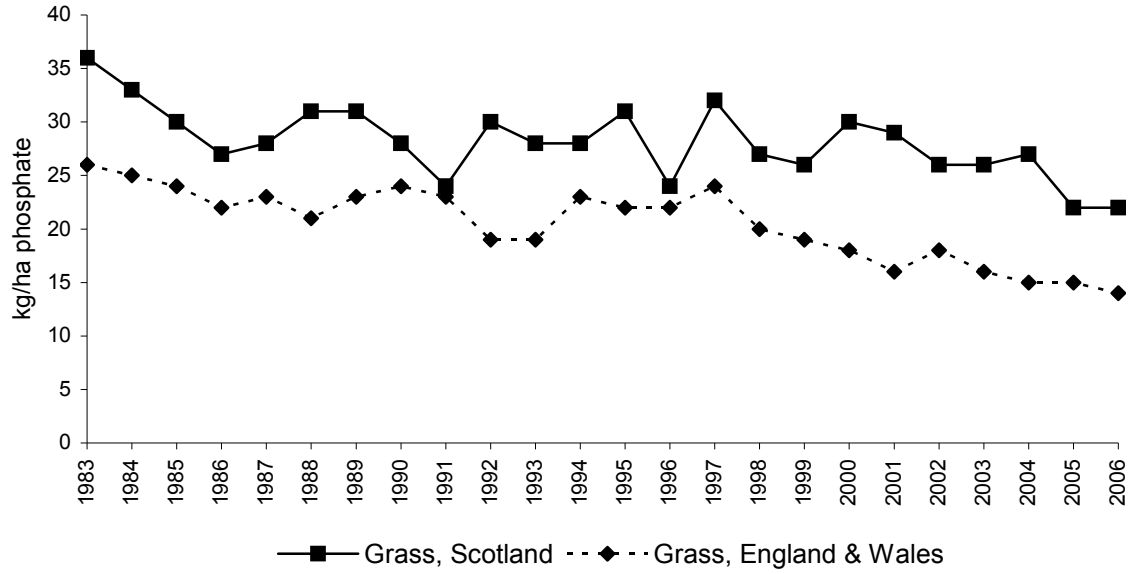
(a)



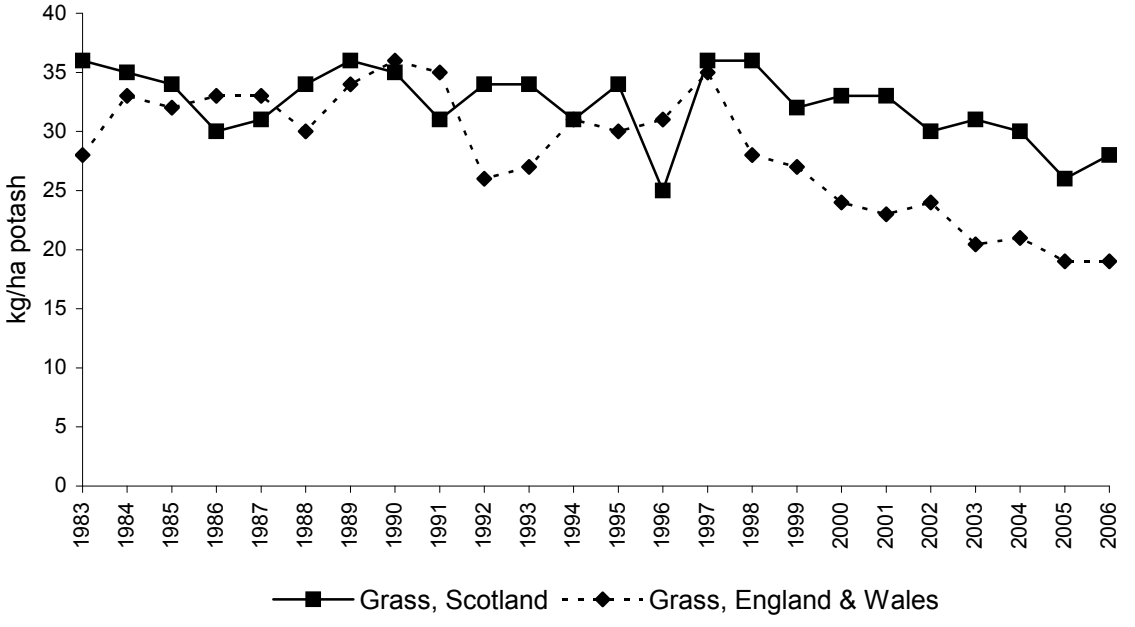
(b)

Figure B2.7 **Overall application rates (kg/ha) of (a) phosphate and (b) potash to grassland in Scotland and in England & Wales 1983-2006**

(a)



(b)



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Note: 1. Row percentages may not sum to exactly to 100 due to rounding.
2. No estimates are shown for crops with less than 5 fields in the sample. Nevertheless, some estimates are based on very few fields in the sample and should be treated with great caution.
3. FYM refers to any form of organic manure applied.

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Note: 1. Row percentages may not sum to exactly to 100 due to rounding.
2. No estimates are shown for crops with less than 5 fields in the sample. Nevertheless, some estimates are based on very few fields in the sample and should be treated with great caution.
3. FYM refers to any form of organic manure applied.

Table GB1.1 Total fertiliser use, Great Britain 2006

	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	92	61	78	31	114	34	56	105	21	44	52
Winter wheat	99	55	55	16	194	62	75	192	34	41	1964
Spring barley	98	73	80	37	103	54	76	101	39	60	654
Winter barley	98	63	70	18	139	59	76	136	37	54	591
Oats	95	66	73	15	108	55	75	102	36	55	206
Rye/Triticale/Durum wheat	100	18	66	0	115	74	74	115	14	49	8
Seed potatoes	100	100	100	42	106	149	182	106	149	182	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	94	87	93	49	151	141	211	142	122	197	118
Sugar beet	92	49	76	37	108	72	143	99	35	109	200
Spring oilseed rape	100	54	68	7	163	55	92	163	30	63	27
Winter oilseed rape	99	57	55	14	193	59	68	192	34	37	556
Linseed	82	18	26	1	84	71	79	69	13	20	36
Forage maize	77	54	51	94	67	76	81	52	41	41	175
Rootcrops for stockfeed	89	62	87	75	95	79	82	84	49	71	91
Leafy forage crops	71	50	50	78	88	31	33	62	15	17	29
Arable silage/Other fodder crops	51	30	36	49	95	46	48	49	14	17	85
Peas - human consumption	3	25	41	1	33	61	84	1	15	34	63
Peas - animal consumption	7	31	32	9	19	87	81	1	27	26	50
Beans - animal consumption	5	33	39	4	59	57	68	3	19	27	180
Vegetables (brassicae)	82	93	93	35	137	69	136	112	64	125	30
Vegetable (other)	28	60	63	11	121	69	92	34	41	58	96
Soft fruit	80	76	80	0	23	20	64	18	15	51	13
Top fruit	75	28	51	0	66	29	103	50	8	52	43
Other tillage	49	20	27	29	74	57	114	36	12	31	81
All tillage	91	57	60	22	162	62	81	147	35	49	5361
Grass under 5 years old	83	65	67	45	129	33	48	106	21	32	1044
Grass 5 years and over	67	54	54	39	95	27	33	64	14	18	2274
All grass	70	56	56	40	103	28	37	72	16	21	3318
All crops and grass	80	57	58	32	134	44	58	107	25	34	8679

Source: British Survey of Fertiliser Practice 2006

Table GB1.2 Use of straight fertiliser, Great Britain 2006

	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	79	0	17	113	58	102	89	0	18	52
Winter wheat	95	8	9	189	83	93	180	7	8	1964
Spring barley	68	2	5	89	80	255	60	1	12	654
Winter barley	91	3	9	130	97	91	118	3	8	591
Oats	80	3	15	105	106	94	84	3	14	206
Rye/Triticale/Durum wheat	100	0	47	113	0	70	113	0	33	8
Seed potatoes	13	0	13	29	0	102	4	0	14	8
Early potatoes	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	40	6	24	105	61	115	42	4	28	118
Sugar beet	86	2	30	100	97	132	87	2	40	200
Spring oilseed rape	99	2	13	151	64	144	149	1	19	27
Winter oilseed rape	97	8	8	183	64	69	177	5	6	556
Linseed	81	4	11	81	167	120	66	7	14	36
Forage maize	27	3	13	74	99	119	20	3	16	175
Rootcrops for stockfeed	10	1	0	108	185	0	11	3	0	91
Leafy forage crops	36	0	0	82	0	0	29	0	0	29
Arable silage/Other fodder crops	26	0	7	72	0	49	18	0	3	85
Peas - human consumption	2	1	17	28	25	89	1	0	15	63
Peas - animal consumption	3	13	15	14	98	75	0	13	11	50
Beans - animal consumption	3	6	12	102	86	83	3	5	10	180
Vegetables (brassicae)	57	0	0	41	0	0	24	0	0	30
Vegetable (other)	19	11	14	139	65	89	27	7	13	96
Soft fruit	4	0	40	61	0	74	2	0	30	13
Top fruit	73	9	32	68	30	136	49	3	43	43
Other tillage	45	6	17	73	57	122	33	4	20	81
All tillage	80	6	10	160	80	105	128	5	10	5361
Grass under 5 years old	41	0	2	117	64	97	48	0	2	1044
Grass 5 years and over	25	1	0	96	64	59	24	0	0	2274
All grass	28	1	1	102	64	79	28	0	1	3318
All crops and grass	52	3	5	144	79	103	74	2	5	8679

Source: British Survey of Fertiliser Practice 2006

Table GB1.3 Use of compound fertiliser, Great Britain 2006

	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	32	61	61	49	34	43	16	20	26	52
Winter wheat	16	48	48	71	57	68	12	27	33	1964
Spring barley	62	71	75	65	53	65	41	38	49	654
Winter barley	26	61	63	67	57	73	18	34	46	591
Oats	32	63	62	54	52	66	17	33	41	206
Rye/Triticale/Durum wheat	6	18	18	31	74	85	2	14	16	8
Seed potatoes	100	100	100	102	149	168	102	149	168	8
Early potatoes	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	77	85	86	130	138	196	100	118	169	118
Sugar beet	15	47	50	84	70	138	13	33	69	200
Spring oilseed rape	22	53	56	59	55	78	13	29	43	27
Winter oilseed rape	27	50	49	53	57	65	14	29	32	556
Linseed	5	14	14	57	43	46	3	6	7	36
Forage maize	56	51	39	57	74	64	32	38	25	175
Rootcrops for stockfeed	81	61	87	91	76	82	73	46	71	91
Leafy forage crops	44	50	50	74	31	33	33	15	17	29
Arable silage/Other fodder crops	26	30	30	115	46	47	30	14	14	85
Peas - human consumption	1	24	24	50	62	80	0	15	19	63
Peas - animal consumption	4	18	18	25	79	81	1	14	14	50
Beans - animal consumption	2	27	27	14	50	62	0	14	17	180
Vegetables (brassicae)	82	93	93	108	69	136	88	64	125	30
Vegetable (other)	11	56	55	61	61	82	7	34	46	96
Soft fruit	76	76	76	21	20	27	16	15	21	13
Top fruit	12	18	19	5	29	48	1	5	9	43
Other tillage	7	14	11	46	58	98	3	8	11	81
All tillage	27	52	52	69	59	73	18	31	38	5361
Grass under 5 years old	63	65	66	92	33	46	58	21	30	1044
Grass 5 years and over	53	54	54	77	26	33	41	14	18	2274
All grass	55	56	56	80	28	36	44	15	20	3318
All crops and grass	42	54	54	77	41	53	32	22	29	8679

Source: British Survey of Fertiliser Practice 2006

Table GB1.4 Use of lime, Great Britain 2006

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	3	52
Winter wheat	3.8	1.2	0.8	-	0.3	6.1	4.1	6.9	4.3	-	4.7	4.7	93	1964
Spring barley	7.8	0.2	3.6	-	2.2	13.8	4.0	2.9	3.9	-	4.0	3.9	85	654
Winter barley	5.7	0.4	0.6	0.2	1.1	8.2	6.6	4.8	2.7	6.9	7.2	6.3	47	591
Oats	5.6	0.5	0.7	-	1.5	8.3	6.3	5.0	4.4	-	3.9	5.6	15	206
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	1	4
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	3	118
Sugar beet	9.1	4.6	0.8	9.1	1.0	24.6	4.9	7.0	4.0	6.1	5.0	5.7	47	200
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Winter oilseed rape	5.2	2.5	1.7	1.4	0.7	11.6	17.9	4.8	4.8	0.5	2.7	10.2	52	556
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	2	36
Forage maize	10.7	0.5	3.4	0.5	5.0	20.1	4.6	6.6	3.2	4.9	4.1	4.3	31	175
Rootcrops for stockfeed	5.4	-	2.2	-	0.2	7.8	4.8	-	4.0	-	1.2	4.5	10	91
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	4	29
Arable silage/Other fodder crops	1.8	-	1.8	-	4.2	7.7	4.9	-	5.2	-	4.2	4.6	8	85
Peas - human consumption	6.3	3.7	-	-	-	10.0	4.1	3.7	-	-	-	4.0	5	63
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	50
Beans - animal consumption	0.2	1.5	1.1	-	0.3	3.1	1.7	2.5	4.9	-	4.9	3.8	5	180
Vegetables (brassicae)	7.7	10.9	4.7	-	4.2	27.5	4.2	5.0	5.0	-	5.7	4.9	11	30
Vegetable (other)	0.2	2.1	-	-	0.5	2.8	2.5	3.9	-	-	3.5	3.7	7	96
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	13
Top fruit	1.0	-	3.3	-	10.3	14.5	0.2	-	4.9	-	0.4	1.4	5	43
Other tillage	1.3	-	-	-	5.9	7.2	4.2	-	-	-	6.5	6.0	6	81
All tillage	4.8	1.2	1.3	0.5	1.1	8.9	6.4	5.8	4.1	4.0	4.7	5.7	441	5361
Grass under 5 years old	3.2	-	1.5	0.4	0.7	5.9	4.2	5.0	4.9	5.4	3.7	4.5	62	1044
Grass 5 years and over	1.2	-	1.0	0.2	0.9	3.2	3.8	3.7	4.7	7.3	2.4	3.9	83	2274
All grass	1.6	-	1.1	0.2	0.9	3.7	3.9	4.5	4.8	6.6	2.6	4.1	145	3318
All crops and grass	3.1	0.6	1.2	0.3	1.0	6.1	5.7	5.8	4.5	5.0	3.7	5.2	586	8679

Source: British Survey of Fertiliser Practice 2006

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2006

	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	65	52	50	28	87	23	25	56	12	13	1520
Grazed mown	82	65	68	61	122	33	48	100	21	33	1392
All grazings	71	57	56	40	102	27	35	72	15	20	2912
Cut for silage - grazed	89	70	74	68	130	34	52	115	24	39	999
Cut for silage - not grazed	81	67	71	61	130	36	52	105	24	37	224
All cur for silage	87	70	74	66	130	35	52	113	24	38	1223
Cut for hay - grazed	64	49	49	36	86	29	32	54	14	16	437
Cut for hay - not grazed	53	42	40	35	86	40	48	45	17	19	105
All cur for hay	62	48	48	36	86	30	34	53	15	16	542
All mowings	81	64	67	59	122	33	49	98	21	33	1714
All grass	70	56	56	40	103	28	37	72	16	21	3318

Source: British Survey of Fertiliser Practice 2006

Table GB3.0 Product and nutrient use by month of application, Great Britain 2006

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product ('000 tonnes)
Straight N	1	0	0	0	0	3	27	42	19	5	2	1	2086
Straight P	21	18	8	0	6	10	12	10	3	1	0	12	52
Straight K	5	10	10	3	5	28	20	12	5	1	0	1	101
Compounds	8	5	2	0	1	4	19	32	12	8	3	5	1873
All Fertilisers	4	3	1	0	1	4	23	36	15	6	2	3	4113

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient ('000 tonnes)
N	1	0	0	0	0	2	24	42	18	7	3	2	972
P_2O_5	14	10	3	0	2	6	18	26	9	4	2	6	225
K_2O	10	9	3	1	2	9	20	25	9	6	2	5	305
Total	5	3	1	0	1	4	22	36	15	6	2	3	1503

Note: 'Product' refers to the total tonnage of the products used by farmers in the survey year 2006.
'Nutrient' use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2006

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2006

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 and grass
Calcium Ammonium Nitrate	0.5	0.4	0.0	0.0	0.5	2.6	0.5	0.3	0.0	0.1	0.0	0.2	0.4
Urea	2.5	8.2	1.7	1.8	8.8	0.4	6.8	1.9	2.3	1.7	0.8	1.8	5.0
Ammonium Nitrate	29.3	46.0	6.5	18.7	44.2	17.1	40.1	25.2	27.2	24.9	32.1	25.0	34.8
UAN	4.2	12.1	1.3	4.9	12.7	2.8	10.3	0.3	0.3	0.6	1.6	0.3	6.8
Other Straight N	2.8	4.4	0.4	1.7	9.1	1.9	4.6	2.3	0.1	0.8	0.0	2.1	3.7
Triple Superphosphate	0.6	1.8	0.6	0.3	1.2	2.8	1.5	0.3	0.3	0.1	0.0	0.3	1.1
Single Superphosphate	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Straight P	0.0	0.1	0.1	0.9	0.2	1.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2
Muriate of Potash	3.9	1.9	4.1	0.9	1.1	8.9	2.4	0.2	0.0	0.5	1.5	0.3	1.6
Other Straight K	0.2	0.3	0.1	20.9	0.3	0.2	1.3	0.0	0.0	0.0	0.0	0.0	0.8
NP	0.2	0.8	1.8	0.2	1.0	5.9	1.0	2.3	1.5	1.8	0.0	2.3	1.5
NK	4.2	1.4	1.4	1.5	1.4	10.1	2.1	4.9	1.5	9.1	0.0	5.2	3.2
PK	9.3	14.1	5.3	30.4	9.9	20.6	13.8	3.8	6.9	4.3	4.7	3.6	10.2
Very High N	5.6	3.5	0.0	0.0	2.8	4.6	3.4	35.1	25.4	31.7	13.0	34.6	14.4
High N	12.1	0.9	0.0	0.1	0.4	4.9	2.2	19.4	26.4	18.3	6.2	19.6	8.3
High P	0.0	0.3	2.7	0.0	0.7	1.5	0.5	0.1	0.1	0.0	0.0	0.1	0.3
High K	8.1	1.5	49.5	15.3	1.6	10.7	4.7	1.4	1.9	2.0	0.0	1.4	3.5
Low N	6.5	1.4	12.0	0.5	2.8	2.4	2.5	1.0	2.3	1.8	35.9	1.3	2.1
Low P	0.4	0.1	9.1	1.7	0.2	0.4	0.5	0.8	2.9	1.9	0.0	1.0	0.6
Equal NPK	9.4	0.5	3.3	0.0	1.2	1.1	1.6	0.7	0.8	0.6	4.2	0.7	1.3
Total Product ('000 tonnes)	**281**	**1624**	**74**	**126**	**420**	**138**	**2663**	**1313**	**119**	**701**	**10**	**1450**	**4113**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table GB3.2 Use of product type by crop group, Great Britain 2006

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	total product ('000 tonnes)
Calcium Ammonium Nitrate	10.0	51.1	0.0	0.0	13.9	25.0	80.0	100.0	0.0	14.6	0.0	20.0	18
Urea	3.9	73.5	0.7	1.3	20.3	0.3	87.4	95.0	10.5	45.1	0.3	12.6	207
Ammonium Nitrate	7.7	70.0	0.5	2.2	17.4	2.2	74.6	91.4	8.9	48.1	0.9	25.4	1429
UAN	4.3	72.2	0.4	2.3	19.5	1.4	98.3	72.0	7.8	83.9	3.4	1.7	278
Other Straight N	6.3	58.4	0.3	1.8	31.1	2.2	80.0	96.6	0.5	17.6	0.0	20.0	153
Triple Superphosphate	3.9	72.0	1.1	0.8	12.5	9.6	90.4	99.9	9.6	16.4	0.0	9.6	44
Single Superphosphate	35.8	26.5	0.0	37.6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1
Other Straight P	0.0	33.9	1.3	19.2	16.8	28.8	81.8	100.0	0.0	15.6	0.0	18.2	7
Muriate of Potash	17.1	49.9	4.8	1.7	7.2	19.2	94.2	78.6	0.6	81.6	4.0	5.8	67
Other Straight K	2.0	15.1	0.2	78.2	3.6	0.9	99.1	100.0	0.0	100.0	0.0	0.9	34
NP	2.3	47.0	4.7	1.0	15.5	29.5	44.8	89.5	5.2	36.5	0.0	55.2	61
NK	20.9	39.2	1.8	3.3	10.4	24.4	43.1	85.1	2.3	85.2	0.0	56.9	132
PK	7.1	62.3	1.1	10.4	11.3	7.7	87.4	94.8	15.6	57.4	0.9	12.6	420
Very High N	17.4	62.9	0.0	0.0	12.8	6.9	15.4	91.8	6.0	44.3	0.3	84.6	593
High N	58.6	26.5	0.0	0.2	3.1	11.5	17.0	89.6	11.1	45.2	0.2	83.0	342
High P	0.0	45.0	15.9	0.0	22.3	16.8	93.2	100.0	8.7	0.0	0.0	6.8	13
High K	18.1	20.0	29.3	15.4	5.4	11.7	86.0	91.3	11.2	69.0	0.0	14.0	146
Low N	27.8	35.1	13.5	0.9	17.6	5.1	77.5	65.4	14.2	64.4	19.4	22.5	85
Low P	8.5	11.3	52.5	16.9	6.7	4.1	48.1	77.7	24.8	93.7	0.0	51.9	27
Equal NPK	61.0	18.7	5.7	0.0	11.2	3.4	81.0	90.9	8.9	38.1	4.3	19.0	54
Total Product ('000 tonnes)	**6.8**	**39.5**	**1.8**	**3.1**	**10.2**	**3.3**	**64.7**	**31.9**	**2.9**	**17.1**	**0.3**	**35.3**	**4112**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table GB3.3 Product use by month of application, Great Britain 2006

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	3.3	32.9	45.6	12.5	1.1	4.2	0.4	0.0	0.0	0.0	0.0	18
Urea	0.0	2.9	26.9	40.7	19.7	6.5	2.5	0.2	0.0	0.0	0.2	0.0	207
Ammonium Nitrate	0.0	2.7	25.7	42.8	18.0	5.7	1.9	1.6	1.1	0.4	0.0	0.0	1429
UAN	0.0	2.4	26.4	44.3	24.1	1.9	0.2	0.3	0.2	0.0	0.0	0.0	278
Other Straight N	0.0	7.0	35.0	35.5	12.5	6.9	1.4	1.0	0.2	0.0	0.1	0.0	153
Triple Superphosphate	5.3	10.6	13.1	9.9	1.9	0.5	0.5	14.1	19.4	18.8	6.0	0.0	44
Single Superphosphate	0.0	0.0	0.0	35.8	0.0	0.0	0.0	6.2	0.0	58.0	0.0	0.0	1
Other Straight P	10.1	6.6	5.1	5.2	12.4	3.9	0.0	1.2	30.8	4.8	19.9	0.0	7
Muriate of Potash	4.4	27.2	26.0	16.0	7.2	0.9	0.6	0.3	5.6	6.0	4.5	1.3	67
Other Straight K	7.6	30.8	7.9	4.2	1.8	0.0	0.0	1.0	3.1	18.1	19.6	5.8	34
NP	0.0	7.2	24.6	45.8	12.3	2.3	0.1	0.6	6.9	0.2	0.0	0.0	61
NK	2.1	2.5	11.7	27.2	13.6	29.6	6.3	5.4	0.4	0.8	0.4	0.0	132
PK	2.5	10.6	12.6	7.5	1.5	1.3	0.3	8.5	26.4	19.3	8.3	1.1	420
Very High N	0.0	0.9	20.2	37.1	16.3	12.9	6.3	5.4	0.8	0.1	0.0	0.0	593
High N	0.1	0.5	18.8	47.7	17.3	6.2	4.1	4.1	1.0	0.2	0.0	0.0	342
High P	0.0	0.0	24.1	22.0	15.0	0.0	0.0	7.4	31.5	0.0	0.0	0.0	13
High K	0.0	6.1	30.6	41.6	12.0	3.5	0.4	0.3	1.7	2.6	0.1	0.8	146
Low N	0.0	2.5	25.6	26.6	13.2	2.1	0.1	8.6	11.1	8.4	1.5	0.2	85
Low P	0.0	0.0	47.5	29.6	9.7	10.8	1.5	0.4	0.0	0.4	0.0	0.0	27
Equal NPK	0.0	6.8	22.9	54.0	6.0	0.6	0.6	1.4	5.9	1.8	0.0	0.0	54
Total Product ('000 tonnes)	**0.5**	**4.1**	**23.0**	**36.5**	**15.0**	**6.5**	**2.4**	**3.2**	**4.3**	**2.9**	**1.2**	**0.2**	**4113**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table EW1.1 Total fertiliser use, England & Wales 2006

	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	89	36	65	28	143	35	66	128	13	43	38
Winter wheat	99	53	53	17	195	61	74	192	33	39	1817
Spring barley	98	52	64	24	106	54	87	104	28	56	392
Winter barley	97	60	68	19	138	58	76	135	35	51	527
Oats	97	61	71	13	112	58	82	109	36	58	157
Rye/Triticale/Durum wheat	100	12	66	0	107	90	73	107	10	48	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	97	87	95	50	152	140	214	147	123	203	98
Sugar beet	92	49	76	37	108	72	143	99	35	109	200
Spring oilseed rape	100	47	63	4	177	52	91	177	25	57	24
Winter oilseed rape	99	54	51	13	194	59	69	192	32	35	501
Linseed	82	18	26	1	84	71	79	69	13	20	36
Forage maize	78	55	52	94	68	75	81	52	41	42	171
Rootcrops for stockfeed	83	41	80	72	114	66	74	94	27	59	56
Leafy forage crops	53	26	26	59	76	31	37	40	8	10	8
Arable silage/Other fodder crops	52	29	36	49	96	44	48	50	13	17	75
Peas - human consumption	3	26	43	1	33	61	84	1	16	36	57
Peas - animal consumption	7	31	32	9	19	87	81	1	27	26	50
Beans - animal consumption	5	31	37	5	63	58	68	3	18	26	169
Vegetables (brassicae)	82	94	94	36	134	65	132	110	61	123	27
Vegetable (other)	26	61	64	11	126	60	88	32	36	56	82
Soft fruit	94	88	94	0	29	25	80	27	22	75	8
Top fruit	75	28	51	0	66	29	103	50	8	52	43
Other tillage	48	19	27	29	73	57	115	35	11	30	79
All tillage	90	52	56	20	167	62	82	150	33	46	4624
Grass under 5 years old	79	58	61	52	139	32	51	109	18	31	698
Grass 5 years and over	65	51	51	41	94	26	32	61	13	16	1896
All grass	67	52	52	43	103	27	36	69	14	19	2594
All crops and grass	78	52	54	32	139	44	59	108	23	32	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.2 Use of straight fertiliser, England & Wales 2006

	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	88	1	28	131	58	87	115	0	25	38
Winter wheat	95	9	9	191	83	93	181	7	8	1817
Spring barley	73	3	8	103	83	266	75	2	21	392
Winter barley	91	3	8	130	100	96	118	3	8	527
Oats	89	4	20	108	106	94	96	4	18	157
Rye/Triticale/Durum wheat	100	0	54	107	0	70	107	0	38	5
Seed potatoes	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	40	8	25	121	61	126	49	5	31	98
Sugar beet	86	2	30	100	97	132	87	2	40	200
Spring oilseed rape	99	2	15	165	64	144	163	1	22	24
Winter oilseed rape	97	8	8	185	65	69	179	5	6	501
Linseed	81	4	11	81	167	120	66	7	14	36
Forage maize	27	3	14	74	99	119	20	3	16	171
Rootcrops for stockfeed	15	2	0	108	185	0	16	4	0	56
Leafy forage crops	33	0	0	91	0	0	30	0	0	8
Arable silage/Other fodder crops	27	0	7	72	0	49	19	0	3	75
Peas - human consumption	2	1	18	28	25	89	1	0	16	57
Peas - animal consumption	3	13	15	14	98	75	0	13	11	50
Beans - animal consumption	3	7	13	102	86	83	3	6	11	169
Vegetables (brassicae)	58	0	0	38	0	0	22	0	0	27
Vegetable (other)	20	10	15	142	46	92	29	5	13	82
Soft fruit	6	0	60	61	0	74	3	0	44	8
Top fruit	73	9	32	68	30	136	49	3	43	43
Other tillage	45	7	17	73	57	122	33	4	20	79
All tillage	82	7	11	166	80	107	136	5	11	4624
Grass under 5 years old	48	0	3	122	64	99	59	0	3	698
Grass 5 years and over	25	0	0	96	63	60	24	0	0	1896
All grass	29	0	1	103	64	80	30	0	1	2594
All crops and grass	54	3	6	149	80	105	81	3	6	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.3 Use of compound fertiliser, England & Wales 2006

	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	27	36	36	47	34	49	13	12	18	38
Winter wheat	15	46	46	72	56	67	11	26	31	1817
Spring barley	37	50	56	78	52	62	29	26	35	392
Winter barley	25	58	60	68	55	73	17	32	44	527
Oats	20	57	57	64	55	69	13	31	39	157
Rye/Triticale/Durum wheat	0	12	12	0	90	90	0	10	10	5
Seed potatoes	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	79	86	87	124	137	197	98	118	171	98
Sugar beet	15	47	50	84	70	138	13	33	69	200
Spring oilseed rape	22	45	48	64	52	72	14	23	35	24
Winter oilseed rape	23	47	45	55	56	66	12	27	30	501
Linseed	5	14	14	57	43	46	3	6	7	36
Forage maize	57	52	40	57	74	64	32	38	25	171
Rootcrops for stockfeed	70	38	80	111	59	74	77	23	59	56
Leafy forage crops	20	26	26	50	31	37	10	8	10	8
Arable silage/Other fodder crops	27	29	29	116	44	47	31	13	14	75
Peas - human consumption	1	26	26	50	62	80	0	16	21	57
Peas - animal consumption	4	18	18	25	79	81	1	14	14	50
Beans - animal consumption	2	25	25	14	51	61	0	12	15	169
Vegetables (brassicae)	82	94	94	107	65	132	88	61	123	27
Vegetable (other)	8	57	57	43	55	76	4	32	43	82
Soft fruit	88	88	88	27	25	35	24	22	31	8
Top fruit	12	18	19	5	29	48	1	5	9	43
Other tillage	6	13	10	36	58	100	2	7	10	79
All tillage	21	47	47	72	59	74	15	27	35	4624
Grass under 5 years old	55	57	60	91	32	48	51	18	29	698
Grass 5 years and over	49	50	50	75	26	32	37	13	16	1896
All grass	50	51	52	78	27	35	39	14	18	2594
All crops and grass	36	49	50	76	41	53	27	20	26	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.4 Use of lime, England & Wales 2006

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	2	38
Winter wheat	3.7	1.3	0.6	-	0.3	5.9	4.1	6.9	4.3	-	4.7	4.8	79	1817
Spring barley	2.7	0.4	0.3	-	2.6	6.0	4.6	2.9	4.6	-	5.3	4.8	32	392
Winter barley	4.8	0.4	0.6	0.3	1.3	7.3	7.5	4.8	2.4	6.9	7.2	6.8	36	527
Oats	5.1	0.6	0.4	-	2.0	8.1	6.9	5.0	4.9	-	3.9	5.9	9	157
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	1	4
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	3	98
Sugar beet	9.1	4.6	0.8	9.1	1.0	24.6	4.9	7.0	4.0	6.1	5.0	5.7	47	200
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	24
Winter oilseed rape	5.2	2.8	1.5	1.6	0.6	11.6	19.4	4.8	4.8	0.5	3.4	10.8	48	501
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	2	36
Forage maize	10.9	0.5	2.6	-	5.1	19.1	4.6	6.6	2.6	-	4.1	4.3	29	171
Rootcrops for stockfeed	6.6	-	1.2	-	0.3	8.0	4.7	-	4.9	-	1.2	4.6	6	56
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	1	8
Arable silage/Other fodder crops	1.5	-	1.5	-	4.5	7.5	4.9	-	5.3	-	4.2	4.6	6	75
Peas - human consumption	6.7	3.9	-	-	-	10.6	4.1	3.7	-	-	-	4.0	5	57
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	50
Beans - animal consumption	0.2	1.6	1.2	-	0.3	3.3	1.7	2.5	4.9	-	4.9	3.8	5	169
Vegetables (brassicae)	8.2	11.4	4.9	-	4.4	28.9	4.2	5.0	5.0	-	5.7	4.9	11	27
Vegetable (other)	0.2	2.3	-	-	0.5	3.1	2.5	3.9	-	-	3.5	3.7	7	82
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Top fruit	1.0	-	3.3	-	10.3	14.5	0.2	-	4.9	-	0.4	1.4	5	43
Other tillage	1.4	-	-	-	5.9	7.3	4.2	-	-	-	6.5	6.0	6	79
All tillage	4.1	1.4	0.8	0.5	1.1	7.9	7.3	5.8	4.2	4.0	5.1	6.2	341	4624
Grass under 5 years old	2.4	-	1.4	0.7	0.9	5.4	4.2	5.0	4.9	5.4	4.2	4.6	43	698
Grass 5 years and over	1.3	-	1.0	0.2	1.0	3.6	3.8	3.7	4.7	7.3	2.5	4.0	72	1896
All grass	1.5	-	1.1	0.3	1.0	3.9	3.9	4.5	4.8	6.6	2.7	4.1	115	2594
All crops and grass	2.8	0.7	0.9	0.4	1.1	5.9	6.3	5.8	4.5	5.0	3.9	5.5	456	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.5 Percentage of crop area by field application rate - N, England & Wales 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	11	3	0	0	9	38	4	7	1	14	12	-	-	-	-	-	-	-	38
Winter wheat	1	0	1	2	4	4	8	16	19	17	11	9	3	2	1	-	-	-	1817
Spring barley	2	1	8	10	28	23	18	4	5	-	-	-	-	-	-	-	-	-	392
Winter barley	3	1	0	6	7	18	29	21	8	5	1	1	-	-	-	-	-	-	527
Oats	3	0	4	8	28	17	28	5	2	3	2	-	-	-	-	-	-	-	157
Rye/Triticale/Durum wheat	0	0	0	0	26	57	0	17	-	-	-	-	-	-	-	-	-	-	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	3	4	15	0	2	7	10	10	23	14	3	6	1	1	-	-	-	-	98
Sugar beet	8	0	11	15	14	30	12	5	1	-	-	-	-	-	-	-	-	-	200
Spring oilseed rape	0	0	0	10	0	17	10	6	12	10	20	16	-	-	-	-	-	-	24
Winter oilseed rape	1	0	1	3	4	4	5	16	21	23	12	5	5	-	-	-	-	-	501
Linseed	18	3	7	29	29	2	7	2	2	-	-	-	-	-	-	-	-	-	36
Forage maize	22	14	9	24	10	8	11	1	-	-	-	-	-	-	-	-	-	-	171
Rootcrops for stockfeed	17	0	2	15	6	7	47	3	0	2	-	-	-	-	-	-	-	-	56
Leafy forage crops	47	0	0	20	24	0	9	-	-	-	-	-	-	-	-	-	-	-	8
Arable silage/Other fodder crops	48	1	12	14	7	7	1	0	4	0	6	-	-	-	-	-	-	-	75
Peas - human consumption	97	0	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57
Peas - animal consumption	93	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
Beans - animal consumption	95	2	1	0	0	0	0	0	1	-	-	-	-	-	-	-	-	-	169
Vegetables (brassicae)	18	0	4	5	4	22	19	18	3	2	2	2	-	-	-	-	-	-	27
Vegetable (other)	74	1	4	0	2	4	1	10	3	-	-	-	-	-	-	-	-	-	82
Soft fruit	6	37	52	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Top fruit	25	16	11	23	16	0	5	5	-	-	-	-	-	-	-	-	-	-	43
Other tillage	52	0	8	27	8	1	4	1	-	-	-	-	-	-	-	-	-	-	79
All tillage	10	1	3	5	7	8	11	13	14	12	7	5	2	1	1	-	-	-	4624
Grass under 5 years old	21	2	6	9	11	7	13	9	8	6	1	4	3	1	-	-	-	-	698
Grass 5 years and over	35	2	14	15	11	6	7	4	2	2	1	1	1	-	-	-	-	-	1896
All grass	33	2	13	14	11	7	8	5	3	2	1	1	1	-	-	-	-	-	2594
All crops and grass	22	2	8	9	9	7	9	9	8	7	4	3	1	1	-	-	-	-	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.6 Percentage of crop area by field application rate – P_2O_5, England & Wales 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	64	17	11	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Winter wheat	47	5	11	24	9	2	1	1	-	-	-	-	-	-	-	-	-	-	1817
Spring barley	48	9	19	16	6	1	0	1	-	-	-	-	-	-	-	-	-	-	392
Winter barley	40	5	14	30	8	2	1	-	-	-	-	-	-	-	-	-	-	-	527
Oats	39	7	13	28	10	3	0	1	-	-	-	-	-	-	-	-	-	-	157
Rye/Triticale/Durum wheat	88	0	0	0	12	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	13	4	6	13	7	6	10	10	16	2	6	1	0	4	1	1	-	-	98
Sugar beet	51	4	15	14	6	5	2	1	0	3	-	-	-	-	-	-	-	-	200
Spring oilseed rape	53	0	16	27	4	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Winter oilseed rape	46	4	13	25	9	2	1	-	-	-	-	-	-	-	-	-	-	-	501
Linseed	82	1	6	7	0	0	0	4	-	-	-	-	-	-	-	-	-	-	36
Forage maize	45	5	6	23	6	9	5	-	-	-	-	-	-	-	-	-	-	-	171
Rootcrops for stockfeed	59	13	7	7	3	2	7	0	2	-	-	-	-	-	-	-	-	-	56
Leafy forage crops	74	0	20	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Arable silage/Other fodder crops	71	11	9	6	2	2	-	-	-	-	-	-	-	-	-	-	-	-	75
Peas - human consumption	74	0	7	15	4	0	1	-	-	-	-	-	-	-	-	-	-	-	57
Peas - animal consumption	69	1	3	6	4	18	-	-	-	-	-	-	-	-	-	-	-	-	50
Beans - animal consumption	69	3	11	11	4	1	0	1	-	-	-	-	-	-	-	-	-	-	169
Vegetables (brassicae)	6	0	18	50	23	3	-	-	-	-	-	-	-	-	-	-	-	-	27
Vegetable (other)	39	1	27	23	5	3	2	-	-	-	-	-	-	-	-	-	-	-	82
Soft fruit	12	34	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Top fruit	72	12	9	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Other tillage	81	0	12	4	2	0	1	-	-	-	-	-	-	-	-	-	-	-	79
All tillage	48	5	12	22	8	3	1	1	-	-	-	-	-	-	-	-	-	-	4624
Grass under 5 years old	42	24	23	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	698
Grass 5 years and over	49	27	18	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1896
All grass	48	27	19	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2594
All crops and grass	48	16	16	13	4	2	1	-	-	-	-	-	-	-	-	-	-	-	7218

Source: British Survey of Fertiliser Practice 2006

Table EW1.7 Percentage of crop area by field application rate – K_2O, England & Wales 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	35	17	6	4	17	19	0	0	1	-	-	-	-	-	-	-	-	-	38
Winter wheat	47	5	8	14	17	5	1	1	0	1	-	-	-	-	-	-	-	-	1817
Spring barley	36	4	21	18	15	3	1	1	0	1	-	-	-	-	-	-	-	-	392
Winter barley	32	5	9	17	22	10	3	1	1	-	-	-	-	-	-	-	-	-	527
Oats	29	4	10	13	24	14	2	2	0	1	-	-	-	-	-	-	-	-	157
Rye/Triticale/Durum wheat	34	0	0	15	51	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
2nd Early/Maincrop potatoes	5	4	1	8	0	5	5	13	6	4	4	18	5	9	6	2	3	1	98
Sugar beet	24	3	5	5	15	19	10	2	4	3	2	2	2	0	0	0	1	4	200
Spring oilseed rape	37	0	16	13	0	19	0	15	-	-	-	-	-	-	-	-	-	-	24
Winter oilseed rape	49	5	8	20	10	5	2	1	1	-	-	-	-	-	-	-	-	-	501
Linseed	74	0	13	3	5	0	0	0	0	4	-	-	-	-	-	-	-	-	36
Forage maize	48	4	5	16	15	2	4	3	1	1	1	-	-	-	-	-	-	-	171
Rootcrops for stockfeed	20	10	9	6	45	1	1	0	7	-	-	-	-	-	-	-	-	-	56
Leafy forage crops	74	0	20	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Arable silage/Other fodder crops	64	8	15	6	5	2	-	-	-	-	-	-	-	-	-	-	-	-	75
Peas - human consumption	57	1	1	11	21	7	1	1	-	-	-	-	-	-	-	-	-	-	57
Peas - animal consumption	68	0	4	14	4	9	1	-	-	-	-	-	-	-	-	-	-	-	50
Beans - animal consumption	63	2	6	14	12	1	0	0	0	1	-	-	-	-	-	-	-	-	169
Vegetables (brassicae)	6	0	0	11	24	5	0	28	22	2	-	-	-	-	-	-	-	-	27
Vegetable (other)	36	2	18	19	4	5	11	1	1	1	0	0	0	3	-	-	-	-	82
Soft fruit	6	34	0	6	0	0	54	-	-	-	-	-	-	-	-	-	-	-	8
Top fruit	49	9	0	5	2	11	2	22	-	-	-	-	-	-	-	-	-	-	43
Other tillage	73	0	3	2	7	3	0	9	0	0	1	0	1	-	-	-	-	-	79
All tillage	44	4	9	15	16	6	2	2	1	1	-	-	-	-	-	-	-	-	4624
Grass under 5 years old	39	19	17	10	5	5	2	1	1	-	-	-	-	-	-	-	-	-	698
Grass 5 years and over	49	24	18	5	3	1	-	-	-	-	-	-	-	-	-	-	-	-	1896
All grass	48	23	17	6	3	2	1	-	-	-	-	-	-	-	-	-	-	-	2594
All crops and grass	46	14	13	10	9	4	1	1	-	-	-	-	-	-	-	-	-	-	7218

Source: British Survey of Fertiliser Practice 2006

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2006

	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	60	47	45	31	89	23	25	54	11	11	1157
Grazed mown	80	62	65	61	117	31	45	94	19	29	1158
All grazings	68	53	53	43	102	27	35	69	14	18	2315
Cut for silage - grazed	87	67	72	69	126	33	49	110	22	35	810
Cut for silage - not grazed	76	57	64	66	126	35	51	96	20	32	129
All cut for silage	85	66	70	69	126	33	49	107	22	35	939
Cut for hay - grazed	62	47	47	36	84	28	32	52	13	15	389
Cut for hay - not grazed	49	36	37	39	91	45	54	44	16	20	83
All cut for hay	60	45	45	37	85	30	34	51	14	16	472
All mowings	78	60	63	61	117	32	46	92	19	29	1363
All grass	67	52	52	43	103	27	36	69	14	19	2594

Source: British Survey of Fertiliser Practice 2006

Table EW2.2 Percentage of grass area by field application rate - N, England & Wales 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	40	3	14	16	9	5	5	3	2	1	1	1	1	-	-	-	-	-	1157
Grazed mown	20	1	11	12	13	9	12	8	5	4	1	2	1	-	-	-	-	-	1158
All grazings	32	2	13	14	11	6	8	5	3	2	1	1	1	-	-	-	-	-	2315
Cut for silage - grazed	13	1	10	12	12	11	15	9	7	6	2	2	1	-	-	-	-	-	810
Cut for silage - not grazed	24	4	8	6	13	11	9	5	6	5	0	2	3	2	-	-	-	-	129
All cut for silage	15	1	9	11	12	11	14	9	6	6	2	2	1	1	-	-	-	-	939
Cut for hay - grazed	38	2	17	9	15	6	4	4	4	-	-	-	-	-	-	-	-	-	389
Cut for hay - not grazed	51	0	9	9	12	13	0	1	5	-	-	-	-	-	-	-	-	-	83
All cut for hay	40	1	16	9	15	7	4	3	4	-	-	-	-	-	-	-	-	-	472
All mowings	22	1	11	11	13	9	11	7	5	4	1	2	1	-	-	-	-	-	1363
All grass	33	2	13	14	11	7	8	5	3	2	1	1	1	-	-	-	-	-	2594

Source: British Survey of Fertiliser Practice 2006

Table EW2.3 Percentage of grass area by field application rate - P_2O_5, England & Wales 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	53	28	16	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1157
Grazed mown	38	26	25	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1158
All grazings	47	27	20	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2315
Cut for silage - grazed	33	26	29	9	2	1	-	-	-	-	-	-	-	-	-	-	-	-	810
Cut for silage - not grazed	43	27	13	10	5	2	-	-	-	-	-	-	-	-	-	-	-	-	129
All cut for silage	34	26	27	9	3	1	-	-	-	-	-	-	-	-	-	-	-	-	939
Cut for hay - grazed	53	23	19	3	0	2	-	-	-	-	-	-	-	-	-	-	-	-	389
Cut for hay - not grazed	64	13	7	2	14	-	-	-	-	-	-	-	-	-	-	-	-	-	83
All cut for hay	55	21	18	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	472
All mowings	40	26	23	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1363
All grass	48	27	19	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2594

Source: British Survey of Fertiliser Practice 2006

Table EW2.4 Percentage of grass area by field application rate - K_2O, England & Wales 2006

row %	kg/ha																		Fields in
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	55	26	16	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1157
Grazed mown	35	21	21	11	6	3	1	1	-	-	-	-	-	-	-	-	-	-	1158
All grazings	47	24	18	6	3	1	1	-	-	-	-	-	-	-	-	-	-	-	2315
Cut for silage - grazed	28	20	24	14	8	4	2	1	-	-	-	-	-	-	-	-	-	-	810
Cut for silage - not grazed	36	21	16	12	5	6	2	0	2	-	-	-	-	-	-	-	-	-	129
All cut for silage	30	20	22	13	7	4	2	1	-	-	-	-	-	-	-	-	-	-	939
Cut for hay - grazed	53	21	14	10	1	0	1	-	-	-	-	-	-	-	-	-	-	-	389
Cut for hay - not grazed	63	13	7	3	5	9	-	-	-	-	-	-	-	-	-	-	-	-	83
All cut for hay	55	20	13	9	2	2	-	-	-	-	-	-	-	-	-	-	-	-	472
All mowings	37	20	20	11	6	3	2	1	-	-	-	-	-	-	-	-	-	-	1363
All grass	48	23	17	6	3	2	1	-	-	-	-	-	-	-	-	-	-	-	2594

Source: British Survey of Fertiliser Practice 2006

Table EW3.0 Product and nutrient use by month of application, England & Wales 2006

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product ('000 tonnes)
Straight N	1	0	0	0	0	3	28	42	18	5	2	1	1889
Straight P	22	19	5	0	6	11	12	8	4	1	0	13	49
Straight K	5	10	10	3	6	29	19	11	5	1	0	1	97
Compounds	9	5	2	0	1	5	22	27	11	8	3	6	1400
All Fertilisers	5	3	1	0	1	5	25	34	15	6	2	3	3435

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient ('000 tonnes)
N	1	0	0	0	0	3	26	40	18	7	2	2	820
P_2O_5	17	10	4	1	2	7	19	20	8	3	2	7	175
K_2O	12	8	4	1	2	11	22	19	8	5	2	6	241
Total	5	3	1	0	1	5	24	33	15	6	2	3	1235

Note: 'Product' refers to the total tonnage of the products used by farmers in the survey year 2006.
'Nutrient' use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2006

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2006

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 and grass
Calcium Ammonium Nitrate	0.2	0.4	0.0	0.0	0.3	2.7	0.5	0.3	0.0	0.1	0.0	0.2	0.4
Urea	4.1	8.6	2.1	1.8	9.4	0.4	7.5	1.8	2.6	1.7	0.8	1.7	5.6
Ammonium Nitrate	34.5	45.8	7.9	18.7	44.0	18.2	41.0	28.1	29.5	27.1	33.6	28.2	36.9
UAN	7.0	12.9	1.4	4.9	13.7	3.1	11.4	0.2	0.4	0.5	1.7	0.3	7.9
Other Straight N	3.3	4.5	0.5	1.7	8.9	1.9	4.7	2.9	0.2	1.0	0.0	2.8	4.1
Triple Superphosphate	0.9	1.9	0.7	0.3	1.3	3.1	1.7	0.1	0.3	0.1	0.0	0.1	1.2
Single Superphosphate	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Straight P	0.0	0.1	0.1	0.9	0.3	1.0	0.2	0.1	0.0	0.0	0.0	0.1	0.2
Muriate of Potash	7.0	1.9	4.9	0.9	1.1	9.7	2.6	0.3	0.0	0.6	1.6	0.4	1.9
Other Straight K	0.5	0.3	0.0	20.9	0.3	0.1	1.4	0.0	0.0	0.1	0.0	0.0	1.0
NP	0.1	0.7	1.0	0.2	0.9	6.3	1.0	1.8	0.1	1.7	0.0	1.7	1.2
NK	5.5	1.3	1.8	1.5	1.0	11.0	2.1	5.6	1.5	10.3	0.0	5.9	3.3
PK	13.9	13.7	6.8	30.4	10.4	21.4	14.3	3.7	7.8	3.7	4.9	3.6	10.9
Very High N	5.6	3.5	0.0	0.0	2.8	4.8	3.3	31.8	24.4	29.5	13.5	31.2	12.1
High N	10.2	1.0	0.0	0.1	0.4	4.3	1.6	19.3	25.2	17.4	6.5	19.3	7.2
High P	0.0	0.4	1.8	0.0	0.4	0.2	0.4	0.1	0.1	0.0	0.0	0.1	0.3
High K	2.1	1.4	46.1	15.3	1.6	9.8	3.8	1.5	1.7	2.0	0.0	1.4	3.1
Low N	0.2	1.0	9.2	0.5	2.1	0.5	1.3	1.0	2.6	2.0	37.5	1.5	1.3
Low P	0.7	0.1	11.5	1.7	0.2	0.4	0.5	0.8	3.3	1.7	0.0	0.9	0.7
Equal NPK	4.0	0.3	4.2	0.0	1.0	1.1	0.8	0.5	0.4	0.6	0.0	0.5	0.7
Total Product ('000 tonnes)	**148**	**1507**	**59**	**126**	**384**	**126**	**2349**	**1002**	**104**	**534**	**10**	**1085**	**3435**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table EW3.2 Use of product type by crop group, England & Wales 2006

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	total product ('000 tonnes)
Calcium Ammonium Nitrate	2.6	56.4	0.0	0.0	9.1	31.9	80.3	100.0	0.0	16.1	0.0	19.7	13
Urea	3.5	73.6	0.7	1.3	20.5	0.3	90.4	94.7	14.6	49.0	0.4	9.6	194
Ammonium Nitrate	5.3	71.8	0.5	2.4	17.6	2.4	75.8	92.0	10.0	47.2	1.1	24.2	1269
UAN	3.9	72.4	0.3	2.3	19.7	1.4	98.8	58.0	11.7	75.8	5.1	1.2	271
Other Straight N	4.4	60.7	0.2	2.0	30.6	2.1	78.7	96.5	0.5	17.7	0.0	21.3	142
Triple Superphosphate	3.4	72.6	1.1	0.8	12.3	9.8	96.5	99.8	18.0	31.1	0.0	3.5	41
Single Superphosphate	35.8	26.5	0.0	37.6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1
Other Straight P	0.0	36.2	1.4	20.5	17.9	24.0	80.8	100.0	0.0	15.6	0.0	19.2	7
Muriate of Potash	17.2	48.8	4.7	1.8	7.1	20.3	94.0	78.6	0.6	81.7	4.1	6.0	64
Other Straight K	2.1	14.9	0.0	79.4	3.1	0.6	99.1	100.0	0.0	100.0	0.0	0.9	33
NP	0.8	46.0	2.5	1.2	15.2	34.2	55.0	94.5	0.6	48.1	0.0	45.0	42
NK	16.6	40.5	2.1	3.8	8.3	28.6	43.1	88.2	2.5	86.4	0.0	56.9	112
PK	6.1	61.5	1.2	11.4	11.8	8.0	89.7	96.4	20.9	50.5	1.3	10.3	375
Very High N	10.6	67.6	0.0	0.0	14.0	7.8	18.7	94.1	7.5	46.6	0.4	81.3	416
High N	40.6	40.4	0.0	0.4	4.1	14.4	15.1	92.2	12.5	44.1	0.3	84.9	247
High P	0.0	66.9	12.7	0.0	17.7	2.7	90.2	100.0	8.7	0.0	0.0	9.8	9
High K	3.4	24.3	30.3	21.6	6.7	13.8	85.1	94.6	11.4	68.7	0.0	14.9	105
Low N	1.1	51.1	17.9	1.9	26.1	2.0	65.4	63.7	16.8	66.4	23.2	34.6	46
Low P	8.5	11.3	52.5	16.9	6.7	4.1	56.8	83.7	35.2	92.6	0.0	43.2	23
Equal NPK	31.2	27.9	13.1	0.0	20.6	7.2	78.3	98.7	8.7	59.7	0.0	21.7	24
All Fertilisers	**4.3**	**43.4**	**1.7**	**3.6**	**11.0**	**3.6**	**67.7**	**28.9**	**3.0**	**15.4**	**0.3**	**31.3**	**3435**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table EW3.3 Product use by month of application, England & Wales 2006

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	4.3	37.5	36.2	15.3	1.4	4.7	0.6	0.0	0.0	0.0	0.0	13
Urea	0.0	2.5	27.2	39.7	20.5	6.7	2.7	0.0	0.0	0.0	0.2	0.0	194
Ammonium Nitrate	0.0	2.7	26.9	42.4	17.6	5.4	1.7	1.6	1.2	0.4	0.0	0.0	1269
UAN	0.0	2.5	26.8	43.9	23.9	2.0	0.2	0.3	0.2	0.0	0.0	0.0	271
Other Straight N	0.0	7.6	35.5	34.4	12.2	7.4	1.5	0.9	0.2	0.0	0.0	0.0	142
Triple Superphosphate	5.7	11.4	13.2	8.3	2.0	0.5	0.6	15.2	20.9	20.3	1.9	0.0	41
Single Superphosphate	0.0	0.0	0.0	35.8	0.0	0.0	0.0	6.2	0.0	58.0	0.0	0.0	1
Other Straight P	10.7	6.9	5.4	0.0	13.1	4.2	0.0	1.3	32.5	5.0	21.0	0.0	7
Muriate of Potash	4.6	27.9	24.9	15.1	7.2	0.9	0.6	0.3	5.9	6.3	4.8	1.3	64
Other Straight K	7.7	30.9	8.0	3.1	1.8	0.0	0.0	1.1	3.2	18.4	19.8	5.9	33
NP	0.0	10.5	20.4	41.1	15.6	2.6	0.2	0.9	8.7	0.0	0.0	0.0	42
NK	2.5	2.7	12.6	24.7	12.9	29.3	7.4	6.4	0.5	0.6	0.5	0.0	112
PK	2.7	11.0	12.6	7.2	1.3	1.4	0.3	9.3	27.7	16.6	8.5	1.3	375
Very High N	0.0	1.1	26.1	33.9	17.0	11.1	5.4	4.1	1.2	0.2	0.0	0.0	416
High N	0.2	0.7	22.9	41.8	17.1	6.2	4.6	5.2	1.2	0.3	0.0	0.0	247
High P	0.0	0.0	34.6	22.2	1.2	0.0	0.0	4.3	37.7	0.0	0.0	0.0	9
High K	0.0	8.4	38.8	29.3	13.1	3.5	0.6	0.1	2.4	2.1	0.2	1.1	105
Low N	0.0	4.6	30.3	13.7	11.0	3.7	0.2	11.4	16.4	5.6	2.8	0.3	46
Low P	0.0	0.0	56.2	26.5	7.7	7.5	1.1	0.5	0.0	0.5	0.0	0.0	23
Equal NPK	0.0	15.2	24.9	43.8	0.9	1.2	1.1	0.4	10.0	2.5	0.0	0.0	24
All Fertilisers	**0.6**	**4.7**	**25.0**	**34.2**	**15.0**	**6.0**	**2.2**	**3.1**	**4.8**	**2.8**	**1.3**	**0.3**	**3435**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table EW4.1 Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2006

		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	92	49	57	32	160	67	88	148	33	50	328
	All grass	62	40	40	49	111	32	50	69	13	20	222
	All crops & grass	76	44	48	41	138	49	71	104	22	34	550
Anglia	All tillage	89	44	40	8	164	74	105	147	33	42	921
	All grass	47	12	15	0	119	34	48	56	4	7	97
	All crops & grass	86	42	38	8	162	73	103	139	31	39	1018
Northern	All tillage	97	71	73	21	202	44	60	196	31	44	223
	All grass	70	64	64	44	95	26	35	67	17	22	306
	All crops & grass	78	66	66	38	133	32	43	103	21	28	529
North East	All tillage	91	50	58	20	170	62	92	155	31	54	1056
	All grass	70	48	52	39	99	27	35	69	13	18	391
	All crops & grass	82	50	56	27	147	49	71	121	24	40	1447
North Mercia	All tillage	87	41	69	39	148	56	82	129	23	56	200
	All grass	69	52	57	60	116	22	34	80	11	20	165
	All crops & grass	75	48	61	53	128	31	51	96	15	31	365
South Mercia	All tillage	88	53	57	31	142	60	79	125	32	45	309
	All grass	59	36	37	24	98	28	39	58	10	14	232
	All crops & grass	71	43	45	27	121	45	60	86	19	27	541
East Midland	All tillage	91	49	44	11	168	64	70	152	31	31	751
	All grass	44	25	25	27	97	32	27	43	8	7	175
	All crops & grass	78	43	39	15	157	59	63	123	25	25	926
South East	All tillage	88	59	66	18	188	57	72	165	34	48	530
	All grass	40	19	20	15	95	24	32	38	5	6	240
	All crops & grass	71	45	50	17	170	52	66	121	24	33	770
South West	All tillage	93	83	79	50	109	65	72	101	54	57	201
	All grass	74	64	62	64	120	30	38	90	19	24	352
	All crops & grass	78	68	66	61	118	38	46	92	26	30	553
Wales	All tillage	81	51	74	76	134	68	85	108	35	63	105
	All grass	79	68	69	48	95	26	33	75	17	22	414
	All crops & grass	79	66	69	50	98	29	38	78	19	26	519

Source: British Survey of Fertiliser Practice 2006

Table EW5.1 Average fertiliser practice on dairy farms, England & Wales 2006

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	-	-	-	-	-	-	-	-	-	-	3
Winter wheat	92	46	47	38	156	43	59	143	20	28	73
Spring barley	100	74	77	62	79	25	36	79	18	28	30
Winter barley	95	76	78	49	119	43	50	113	32	39	38
Oats	-	-	-	-	-	-	-	-	-	-	4
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	4
Linseed	-	-	-	-	-	-	-	-	-	-	1
Forage maize	79	63	55	96	65	79	80	51	50	44	68
Rootcrops for stockfeed	84	71	71	69	69	41	44	58	29	31	7
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	0
Arable silage/Other fodder crops	63	60	60	76	137	40	40	86	24	24	15
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	87	60	58	64	109	53	60	95	32	35	248
Grass under 5 years old	84	67	72	81	153	30	53	128	20	38	180
Grass 5 years and over	86	62	64	73	127	28	37	110	17	24	435
All grass	86	63	65	74	132	28	41	113	18	26	615
All crops and grass	86	63	64	73	129	31	43	111	20	28	863

Source: British Survey of Fertiliser Practice 2006

Table EW5.2 Average fertiliser practice on cattle and sheep farms, England & Wales 2006

	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	95	49	58	56	162	48	64	154	24	37	27
Spring barley	99	63	63	73	128	97	105	126	61	66	34
Winter barley	73	63	66	84	128	52	62	93	33	41	21
Oats	100	78	78	46	78	28	33	78	21	26	17
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	55	46	54	89	69	68	74	38	32	40	13
Rootcrops for stockfeed	59	73	59	71	86	67	43	50	49	25	14
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/Other fodder crops	70	52	52	59	132	45	45	92	23	23	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	1
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	82	58	61	68	122	59	66	100	35	40	142
Grass under 5 years old	91	73	74	64	123	31	41	112	22	30	135
Grass 5 years and over	58	53	51	40	68	23	26	39	12	13	690
All grass	60	54	53	42	74	24	28	44	13	15	825
All crops and grass	61	55	53	43	76	26	29	47	14	16	967

Source: British Survey of Fertiliser Practice 2006

Table EW5.3 Average fertiliser practice on other livestock/mixed farms, England & Wales 2006

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	68	65	65	37	196	43	69	133	28	45	9
Winter wheat	96	34	36	35	187	62	78	179	21	29	267
Spring barley	99	67	77	35	89	47	56	88	31	43	88
Winter barley	97	65	70	35	135	55	78	131	36	55	109
Oats	87	56	63	27	91	51	74	79	29	47	39
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	1
2nd Early/Maincrop potatoes	78	77	89	86	91	137	163	71	106	145	10
Sugar beet	67	28	30	88	96	109	124	65	30	37	14
Spring oilseed rape	100	44	32	7	140	59	110	140	26	36	7
Winter oilseed rape	100	38	51	30	166	65	85	166	25	43	44
Linseed	-	-	-	-	-	-	-	-	-	-	3
Forage maize	84	34	36	97	72	55	100	61	18	35	51
Rootcrops for stockfeed	91	24	86	81	120	69	80	110	16	69	17
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/Other fodder crops	34	10	27	43	72	29	48	24	3	13	33
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	4
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	0	44	52	21	0	60	84	0	26	43	23
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	1
Vegetable (other)	39	48	0	28	15	59	0	6	28	0	9
Soft fruit	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	-	-	-	-	-	-	-	-	-	-	4
All tillage	87	43	50	42	145	59	78	126	25	39	739
Grass under 5 years old	76	53	57	39	132	31	54	100	16	31	158
Grass 5 years and over	66	43	49	20	96	30	36	64	13	18	265
All grass	69	46	51	25	106	30	41	73	14	21	423
All crops and grass	77	44	51	33	126	43	57	97	19	29	1162

Source: British Survey of Fertiliser Practice 2006

Table EW5.4 Average fertiliser practice on cropping/horticultural farms, England & Wales 2006

	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	93	28	66	24	137	32	68	128	9	45	26
Winter wheat	99	56	55	13	197	62	74	196	35	40	1450
Spring barley	98	46	59	14	111	55	103	109	25	61	240
Winter barley	99	57	67	10	141	61	78	139	35	52	359
Oats	98	59	72	5	122	66	91	120	39	65	97
Rye/Triticale/Durum wheat	100	12	66	0	107	90	73	107	10	48	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	3
2nd Early/Maincrop potatoes	99	89	95	45	158	141	221	157	125	210	88
Sugar beet	94	51	79	34	108	70	144	101	36	113	186
Spring oilseed rape	100	49	79	2	196	49	87	196	24	68	17
Winter oilseed rape	99	55	52	12	196	59	68	194	33	35	453
Linseed	82	18	27	0	86	74	80	71	13	21	32
Forage maize	74	71	66	85	67	85	68	50	60	45	39
Rootcrops for stockfeed	70	70	76	38	120	67	75	84	47	57	18
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/Other fodder crops	65	18	18	26	53	73	81	35	13	15	17
Peas - human consumption	3	28	47	1	33	61	84	1	17	39	52
Peas - animal consumption	7	26	27	9	16	81	72	1	21	19	47
Beans - animal consumption	5	30	36	3	63	58	67	3	17	24	142
Vegetables (brassicae)	87	99	99	38	134	65	132	116	65	130	26
Vegetable (other)	26	61	65	11	128	60	88	33	37	58	72
Soft fruit	93	93	93	0	27	25	81	25	23	76	7
Top fruit	78	29	52	0	66	29	103	52	8	54	42
Other tillage	57	23	32	17	73	57	115	42	13	36	74
All tillage	91	53	57	14	174	63	85	158	34	48	3495
Grass under 5 years old	65	37	40	17	139	40	59	91	15	24	225
Grass 5 years and over	50	28	28	9	97	33	43	48	9	12	506
All grass	54	30	31	11	110	36	48	59	11	15	731
All crops and grass	84	49	52	13	167	60	81	141	30	42	4226

Source: British Survey of Fertiliser Practice 2006

Table SC1.1 Total fertiliser use, Scotland 2006

	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	96	91	94	35	80	34	48	76	31	45	14
Winter wheat	99	83	90	9	187	62	85	186	52	77	147
Spring barley	98	95	97	52	99	54	67	97	51	65	262
Winter barley	100	94	97	15	147	64	79	147	60	76	64
Oats	88	82	80	19	91	47	58	80	39	46	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	100	100	100	42	106	149	182	106	149	182	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	83	83	88	42	145	141	193	121	118	169	20
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	88	93	21	188	60	64	188	53	59	55
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	100	100	99	79	67	88	93	67	88	93	35
Leafy forage crops	75	56	56	83	90	30	33	67	17	19	21
Arable silage/Other fodder crops	36	36	36	49	77	65	49	28	24	18	10
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	6	61	61	1	17	49	70	1	30	42	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	50	54	54	8	95	167	142	47	91	77	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	95	89	91	35	128	60	75	121	53	69	737
Grass under 5 years old	90	79	77	30	112	34	43	101	27	33	346
Grass 5 years and over	80	73	68	29	99	28	37	79	20	26	378
All grass	83	75	71	29	103	30	39	86	22	28	724
All crops and grass	87	79	78	31	113	42	54	98	33	42	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.2 Use of straight fertiliser, Scotland 2006

	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	67	0	3	84	0	270	57	0	9	14
Winter wheat	95	1	11	170	40	98	162	0	10	147
Spring barley	62	1	1	70	61	98	44	0	1	262
Winter barley	94	2	14	132	37	63	124	1	9	64
Oats	52	0	0	91	0	0	47	0	0	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	3
Seed potatoes	13	0	13	29	0	102	4	0	14	8
Early potatoes	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	38	0	19	27	0	52	10	0	10	20
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	95	4	9	162	37	72	155	2	6	55
Linseed	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	1	0	0	73	0	0	0	0	0	35
Leafy forage crops	36	0	0	80	0	0	29	0	0	21
Arable silage/Other fodder crops	11	0	0	43	0	0	5	0	0	10
Peas - human consumption	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	11	11	11	78	246	50	9	27	6	14
Soft fruit	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	2
All tillage	69	1	5	116	72	86	80	1	4	737
Grass under 5 years old	28	0	0	100	63	69	28	0	0	346
Grass 5 years and over	22	2	0	94	64	38	20	1	0	378
All grass	24	1	0	97	64	57	23	1	0	724
All crops and grass	39	1	2	108	66	84	43	1	1	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.3 Use of compound fertiliser, Scotland 2006

	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	38	91	91	50	34	40	19	31	36	14
Winter wheat	37	82	82	65	63	81	24	51	67	147
Spring barley	91	95	96	59	54	67	54	51	64	262
Winter barley	40	92	94	60	65	72	24	60	68	64
Oats	73	82	80	45	47	58	33	39	46	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	3
Seed potatoes	100	100	100	102	149	168	102	149	168	8
Early potatoes	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	68	83	83	162	141	191	111	118	159	20
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	70	84	86	47	61	61	33	51	53	55
Linseed	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	100	100	99	67	88	93	67	88	93	35
Leafy forage crops	50	56	56	76	30	33	38	17	19	21
Arable silage/Other fodder crops	26	36	36	91	65	49	23	24	18	10
Peas - human consumption	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	6	61	61	17	49	70	1	30	42	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	38	43	43	100	147	166	38	63	71	14
Soft fruit	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	2
All tillage	68	88	89	61	60	73	42	53	64	737
Grass under 5 years old	77	78	77	94	34	43	73	26	33	346
Grass 5 years and over	70	71	68	84	27	37	59	19	26	378
All grass	72	74	71	87	29	39	63	22	28	724
All crops and grass	71	79	77	79	41	52	56	32	41	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.4 Use of lime, Scotland 2006

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	14
Winter wheat	6.0	-	2.9	-	-	9.0	4.0	-	4.2	-	-	4.1	14	147
Spring barley	13.5	-	7.4	-	1.8	22.6	3.8	-	3.9	-	1.9	3.7	53	262
Winter barley	15.0	-	1.2	-	-	16.2	3.8	-	4.2	-	-	3.8	11	64
Oats	7.1	-	1.6	-	-	8.7	4.9	-	3.9	-	-	4.7	6	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	2	4
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	-	-	4	35
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	3	21
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	2	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	-	-	0	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	0	2
All tillage	9.4	-	4.8	-	0.9	15.1	3.8	-	4.1	-	1.7	3.8	100	737
Grass under 5 years old	4.8	-	1.7	-	0.3	6.8	4.1	-	5.0	-	0.2	4.4	19	346
Grass 5 years and over	0.5	-	0.6	-	0.2	1.4	3.6	-	4.9	-	0.2	3.6	11	378
All grass	1.9	-	1.0	-	0.2	3.1	4.0	-	4.9	-	0.2	4.1	30	724
All crops and grass	4.5	-	2.3	-	0.5	7.3	3.9	-	4.3	-	1.2	3.9	130	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.5 Percentage of crop area by field application rate - N, Scotland 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	4	0	31	27	17	1	16	-	-	-	-	-	-	-	-	-	-	-	14
Winter wheat	1	0	1	4	6	4	7	20	21	23	5	1	1	3	-	-	-	-	147
Spring barley	2	1	5	16	25	35	9	7	-	-	-	-	-	-	-	-	-	-	262
Winter barley	0	0	3	7	14	3	18	20	17	15	0	2	-	-	-	-	-	-	64
Oats	12	6	4	22	17	25	8	1	-	-	-	-	-	-	-	-	-	-	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	0	17	0	6	14	18	25	20	-	-	-	-	-	-	-	-	-	-	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	17	15	0	3	5	6	17	9	2	19	6	-	-	-	-	-	-	-	20
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	0	0	0	4	12	1	0	15	23	18	19	3	4	1	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	0	2	4	71	18	4	1	-	-	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	25	0	2	34	19	3	3	15	-	-	-	-	-	-	-	-	-	-	21
Arable silage/Other fodder crops	64	0	11	0	12	14	-	-	-	-	-	-	-	-	-	-	-	-	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	94	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	50	1	0	20	17	0	0	0	11	-	-	-	-	-	-	-	-	-	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All tillage	5	2	4	13	17	19	8	10	8	8	3	1	1	1	-	-	-	-	737
Grass under 5 years old	10	1	7	21	16	10	13	6	7	2	2	2	-	-	-	-	-	-	346
Grass 5 years and over	20	2	12	26	10	7	7	6	2	2	3	1	-	-	-	-	-	-	378
All grass	17	2	11	24	12	8	9	6	4	2	3	1	-	-	-	-	-	-	724
All crops and grass	13	2	8	21	13	11	9	8	5	4	3	1	-	-	-	-	-	-	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.6 Percentage of crop area by field application rate - P_2O_5, Scotland 2006

row %	kg/ha																		
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Spring wheat	9	49	0	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Winter wheat	17	5	18	30	27	2	1	-	-	-	-	-	-	-	-	-	-	-	147
Spring barley	5	7	29	43	14	1	-	-	-	-	-	-	-	-	-	-	-	-	262
Winter barley	6	2	24	26	35	4	0	2	-	-	-	-	-	-	-	-	-	-	64
Oats	18	18	23	21	20	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	0	17	0	0	0	0	31	20	0	13	19	-	-	-	-	-	-	-	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	17	15	0	3	5	4	16	12	12	0	16	-	-	-	-	-	-	-	20
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	12	14	17	26	29	2	-	-	-	-	-	-	-	-	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	0	2	2	50	20	2	7	16	1	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	44	14	36	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Arable silage/Other fodder crops	64	0	17	9	0	10	-	-	-	-	-	-	-	-	-	-	-	-	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	39	0	43	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	46	0	0	0	1	9	9	12	11	0	11	-	-	-	-	-	-	-	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All tillage	11	9	22	34	19	2	1	1	0	0	1	-	-	-	-	-	-	-	737
Grass under 5 years old	21	25	37	13	3	-	-	-	-	-	-	-	-	-	-	-	-	-	346
Grass 5 years and over	27	33	28	10	1	1	-	-	-	-	-	-	-	-	-	-	-	-	378
All grass	25	31	31	11	2	1	-	-	-	-	-	-	-	-	-	-	-	-	724
All crops and grass	21	23	28	19	8	1	-	-	-	-	-	-	-	-	-	-	-	-	1461

Source: British Survey of Fertiliser Practice 2006

Table SC1.7 Percentage of crop area by field application rate - K_2O, Scotland 2006

row %	kg/ha																		
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Spring wheat	6	33	16	27	15	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Winter wheat	10	4	7	18	34	21	4	1	-	-	-	-	-	-	-	-	-	-	147
Spring barley	3	6	18	37	27	7	3	-	-	-	-	-	-	-	-	-	-	-	262
Winter barley	3	3	21	12	43	12	4	2	-	-	-	-	-	-	-	-	-	-	64
Oats	20	15	16	19	25	5	1	-	-	-	-	-	-	-	-	-	-	-	49
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	0	0	17	0	0	4	6	0	0	25	48	-	-	-	-	-	-	-	8
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	12	0	0	19	3	0	5	5	12	0	21	6	10	0	0	6	-	-	20
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	7	14	15	37	16	6	5	-	-	-	-	-	-	-	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	1	1	1	10	27	52	6	2	-	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	44	8	43	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Arable silage/Other fodder crops	64	0	17	14	0	5	-	-	-	-	-	-	-	-	-	-	-	-	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	39	0	9	35	17	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	46	0	0	11	12	11	0	0	9	0	0	0	11	-	-	-	-	-	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All tillage	9	7	14	27	27	11	3	1	0	0	1	0	1	-	-	-	-	-	737
Grass under 5 years old	23	24	27	13	7	2	3	-	-	-	-	-	-	-	-	-	-	-	346
Grass 5 years and over	32	30	21	7	7	1	3	-	-	-	-	-	-	-	-	-	-	-	378
All grass	29	28	23	9	7	1	3	-	-	-	-	-	-	-	-	-	-	-	724
All crops and grass	22	21	20	15	14	5	3	-	-	-	-	-	-	-	-	-	-	-	1461

Source: British Survey of Fertiliser Practice 2006

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2006

	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	79	69	64	18	82	24	27	65	17	17	363
Grazed mown	95	87	88	57	147	41	63	140	36	56	234
All grazings	83	73	70	28	101	29	38	83	21	27	597
Cut for silage - grazed	95	87	89	61	153	42	67	146	37	59	189
Cut for silage - not grazed	93	88	86	49	135	39	54	126	34	47	95
All cut for silage	95	87	88	57	148	41	63	140	36	55	284
Cut for hay - grazed	92	83	83	35	100	35	37	92	29	30	48
Cut for hay - not grazed	71	71	56	15	71	28	32	51	19	18	22
All cut for hay	84	79	74	28	92	33	35	78	26	26	70
All mowings	93	86	86	53	141	40	60	131	35	51	351
All grass	83	75	71	29	103	30	39	86	22	28	724

Source: British Survey of Fertiliser Practice 2006

Table SC2.2 Percentage of grass area by field application rate - N, Scotland 2006

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	21	2	15	30	10	6	6	6	1	0	0	1	0	1	-	-	-	-	363
Grazed mown	5	0	2	14	11	9	17	7	10	7	12	2	0	1	1	-	-	-	234
All grazings	17	2	11	26	10	7	9	6	3	2	3	1	0	1	-	-	-	-	597
Cut for silage - grazed	5	0	1	14	9	7	18	7	11	7	14	3	0	1	1	-	-	-	189
Cut for silage - not grazed	7	0	0	9	18	18	14	9	10	7	3	4	-	-	-	-	-	-	95
All cut for silage	5	0	1	13	12	11	16	8	11	7	11	3	0	1	1	-	-	-	284
Cut for hay - grazed	8	1	5	16	21	23	15	9	1	0	1	-	-	-	-	-	-	-	48
Cut for hay - not grazed	29	0	15	12	40	2	2	-	-	-	-	-	-	-	-	-	-	-	22
All cut for hay	16	1	8	15	28	16	10	6	-	-	-	-	-	-	-	-	-	-	70
All mowings	7	0	2	13	14	11	16	7	9	6	9	3	0	1	1	-	-	-	351
All grass	17	2	11	24	12	8	9	6	4	2	3	1	0	1	-	-	-	-	724

Source: British Survey of Fertiliser Practice 2006

Table SC2.3 Percentage of grass area by field application rate - P_2O_5, Scotland 2006

row %	kg/ha																		
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	31	36	26	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	363
Grazed mown	13	18	37	26	5	1	-	-	-	-	-	-	-	-	-	-	-	-	234
All grazings	27	32	29	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	597
Cut for silage - grazed	13	18	35	28	5	1	-	-	-	-	-	-	-	-	-	-	-	-	189
Cut for silage - not grazed	12	22	44	20	2	-	-	-	-	-	-	-	-	-	-	-	-	-	95
All cut for silage	13	19	38	25	4	1	-	-	-	-	-	-	-	-	-	-	-	-	284
Cut for hay - grazed	17	21	44	16	3	-	-	-	-	-	-	-	-	-	-	-	-	-	48
Cut for hay - not grazed	29	31	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
All cut for hay	21	24	43	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	70
All mowings	14	20	39	23	4	1	-	-	-	-	-	-	-	-	-	-	-	-	351
All grass	25	31	31	11	2	1	-	-	-	-	-	-	-	-	-	-	-	-	724

Source: British Survey of Fertiliser Practice 2006

Table SC2.4 Percentage of grass area by field application rate - K_2O, Scotland 2006

row %	kg/ha																		
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	36	36	19	5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	363
Grazed mown	12	14	27	16	14	5	13	-	-	-	-	-	-	-	-	-	-	-	234
All grazings	30	31	21	8	6	1	3	-	-	-	-	-	-	-	-	-	-	-	597
Cut for silage - grazed	11	12	26	16	14	6	15	-	-	-	-	-	-	-	-	-	-	-	189
Cut for silage - not grazed	14	12	31	22	18	2	0	2	-	-	-	-	-	-	-	-	-	-	95
All cut for silage	12	12	27	18	15	5	10	1	-	-	-	-	-	-	-	-	-	-	284
Cut for hay - grazed	17	30	30	11	11	-	-	-	-	-	-	-	-	-	-	-	-	-	48
Cut for hay - not grazed	44	13	38	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
All cut for hay	26	24	33	9	7	-	-	-	-	-	-	-	-	-	-	-	-	-	70
All mowings	14	14	28	17	14	4	9	-	-	-	-	-	-	-	-	-	-	-	351
All grass	29	28	23	9	7	1	3	-	-	-	-	-	-	-	-	-	-	-	724

Source: British Survey of Fertiliser Practice 2006

Table SC3.0 Product and nutrient use by month of application, Scotland 2006

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product ('000 tonnes)
Straight N	0	0	1	0	0	3	17	47	20	7	3	2	198
Straight P	0	0	52	0	0	0	10	38	0	0	0	0	4
Straight K	0	0	0	0	0	15	41	38	6	1	0	0	4
Compounds	2	5	1	0	0	1	11	49	14	10	4	4	472
All Fertilisers	2	4	1	0	0	1	13	48	15	9	4	4	678

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient ('000 tonnes)
N	0	0	0	0	0	1	13	50	17	10	4	4	152
P_2O_5	6	9	2	0	0	1	14	46	11	5	2	4	51
K_2O	4	10	1	0	0	2	13	45	11	8	2	4	64
Total	2	5	1	0	0	2	13	48	14	8	3	4	267

Note: 'Product' refers to the total tonnage of the products used by farmers in the survey year 2006.
'Nutrient' use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2006

Table SC3.1 Product type as percentage of all product used by crop group, Scotland 2006

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 and grass
Calcium Ammonium Nitrate	0.8	1.0	0.0	0.0	2.8	0.9	1.1	0.3	0.0	0.1	0.0	0.2	0.6
Urea	0.8	3.5	0.0	0.0	2.5	0.0	1.9	2.3	0.0	1.5	0.0	2.0	2.0
Ammonium Nitrate	23.6	47.9	1.3	0.0	45.7	4.4	33.4	15.9	12.0	17.8	0.0	15.4	23.7
UAN	1.0	3.0	1.1	0.0	1.5	0.0	1.8	0.5	0.0	1.0	0.0	0.4	1.1
Other Straight N	2.2	3.5	0.2	0.0	11.1	2.6	3.6	0.2	0.0	0.0	0.0	0.1	1.7
Triple Superphosphate	0.2	0.1	0.0	0.0	0.4	0.0	0.2	0.9	1.0	0.1	0.0	0.8	0.5
Single Superphosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Straight P	0.0	0.0	0.0	0.0	0.0	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash	0.4	2.0	1.3	0.0	0.9	0.0	1.1	0.0	0.0	0.1	0.0	0.0	0.5
Other Straight K	0.0	0.1	0.4	0.0	0.5	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1
NP	0.3	2.0	4.6	0.0	2.1	1.7	1.4	4.0	10.8	2.0	0.0	4.1	2.9
NK	2.9	2.3	0.0	0.0	5.4	0.2	2.7	2.5	1.1	5.2	0.0	3.1	2.9
PK	4.3	18.4	0.0	0.0	5.1	10.9	9.7	4.1	1.1	6.4	0.0	3.9	6.6
Very High N	5.7	4.1	0.0	0.0	2.1	2.0	4.3	45.8	32.8	38.7	0.0	44.9	26.1
High N	14.2	0.3	0.0	0.0	0.8	11.3	6.7	19.5	34.8	21.2	0.0	20.3	14.0
High P	0.0	0.0	6.0	0.0	3.6	16.1	1.3	0.0	0.0	0.0	0.0	0.0	0.6
High K	14.7	2.9	62.4	0.0	2.3	20.6	11.5	1.2	3.4	2.0	0.0	1.3	6.0
Low N	13.5	6.6	22.7	0.0	10.3	23.8	11.4	0.8	0.2	1.0	0.0	0.9	5.7
Low P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	2.4	0.0	1.1	0.6
Equal NPK	15.4	2.4	0.0	0.0	2.7	1.1	7.8	1.3	3.0	0.5	100.0	1.4	4.4
Total Product ('000 tonnes)	**134**	**117**	**15**	**0**	**36**	**12**	**313**	**311**	**15**	**168**	**0**	**364**	**678**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table SC3.2 Use of product type by crop group, Scotland 2006

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	total product ('000 tonnes)
Calcium Ammonium Nitrate	33.4	34.2	0.0	0.0	29.3	3.1	79.3	100.0	0.0	10.0	0.0	20.7	4
Urea	16.9	68.1	0.0	0.0	15.0	0.0	44.7	95.7	0.0	35.1	0.0	55.3	13
Ammonium Nitrate	30.2	53.5	0.2	0.0	15.7	0.5	65.0	88.0	3.3	53.2	0.0	35.0	161
UAN	24.7	62.3	3.1	0.0	9.9	0.0	77.3	100.0	0.0	100.0	0.0	22.7	7
Other Straight N	25.6	36.0	0.3	0.0	35.4	2.7	96.0	100.0	0.0	7.9	0.0	4.0	12
Triple Superphosphate	42.7	25.2	0.0	0.0	32.1	0.0	14.6	100.0	5.2	8.8	0.0	85.4	3
Single Superphosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Other Straight P	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	15.1	69.4	6.1	0.0	9.4	0.0	96.8	78.3	0.0	75.2	0.0	3.2	3
Other Straight K	0.0	26.9	12.0	0.0	38.6	22.4	100.0	0.0	0.0	0.0	0.0	0.0	1
NP	9.9	52.3	16.1	0.0	17.1	4.6	22.6	83.3	11.0	21.8	0.0	77.4	19
NK	45.1	31.9	0.0	0.0	22.8	0.3	43.1	67.8	1.5	78.2	0.0	56.9	20
PK	19.0	70.9	0.0	0.0	6.0	4.2	68.1	90.5	1.2	76.4	0.0	31.9	44
Very High N	57.1	35.4	0.0	0.0	5.7	1.8	7.6	87.1	3.1	39.6	0.0	92.4	177
High N	90.5	1.8	0.0	0.0	1.4	6.3	22.1	82.0	7.2	48.2	0.0	77.9	95
High P	0.0	0.0	22.6	0.0	31.6	45.7	100.0	0.0	0.0	0.0	0.0	0.0	4
High K	54.8	9.4	26.8	0.0	2.3	6.7	88.2	80.5	10.8	69.8	0.0	11.8	41
Low N	50.5	21.6	9.8	0.0	10.3	7.7	91.9	74.0	0.9	54.1	0.0	8.1	39
Low P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.4	0.0	96.3	0.0	100.0	4
Equal NPK	83.9	11.6	0.0	0.0	4.0	0.5	83.2	82.5	9.2	15.4	8.8	16.8	29
All Fertilisers	**19.7**	**17.2**	**2.3**	**0.0**	**5.3**	**1.7**	**46.2**	**45.9**	**2.3**	**24.7**	**0.1**	**53.8**	**678**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table SC3.3 Product use by month of application, Scotland 2006

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	0.0	18.6	75.2	3.7	0.0	2.5	0.0	0.0	0.0	0.0	0.0	4
Urea	0.0	8.7	22.0	54.9	7.3	4.2	0.0	2.9	0.0	0.0	0.0	0.0	13
Ammonium Nitrate	0.0	2.7	15.6	45.6	21.3	8.1	3.6	1.6	0.3	0.3	0.6	0.0	161
UAN	0.0	0.0	13.4	56.6	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7
Other Straight N	0.0	0.1	28.9	48.5	17.2	1.2	0.0	2.7	0.0	0.0	1.4	0.0	12
Triple Superphosphate	0.0	0.0	11.6	30.5	0.0	0.0	0.0	0.0	0.0	0.0	57.9	0.0	3
Single Superphosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Straight P	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	0.0	14.3	46.5	31.9	6.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	3
Other Straight K	0.0	22.4	0.0	77.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
NP	0.0	0.0	33.6	56.0	5.3	1.7	0.0	0.0	2.9	0.6	0.0	0.0	19
NK	0.0	1.2	6.6	41.7	17.6	31.0	0.5	0.0	0.0	1.5	0.0	0.0	20
PK	0.6	6.9	13.4	9.4	3.1	0.8	0.0	1.7	15.7	42.1	6.4	0.0	44
Very High N	0.0	0.3	6.2	44.7	14.6	17.0	8.4	8.6	0.0	0.0	0.0	0.0	177
High N	0.0	0.0	8.4	63.0	17.8	6.2	2.9	1.3	0.4	0.0	0.0	0.0	95
High P	0.0	0.0	0.0	21.8	46.6	0.0	0.0	14.3	17.3	0.0	0.0	0.0	4
High K	0.0	0.0	9.3	73.5	8.9	3.5	0.0	1.0	0.0	3.7	0.0	0.0	41
Low N	0.0	0.0	20.0	42.0	15.9	0.3	0.0	5.2	4.9	11.7	0.0	0.0	39
Low P	0.0	0.0	0.0	46.7	21.0	29.0	3.3	0.0	0.0	0.0	0.0	0.0	4
Equal NPK	0.0	0.0	21.3	62.3	10.2	0.0	0.2	2.2	2.6	1.3	0.0	0.0	29
All Fertilisers	**0.0**	**1.5**	**12.7**	**48.1**	**15.4**	**8.7**	**3.5**	**3.6**	**1.7**	**3.8**	**0.9**	**0.0**	**678**

N.B: Precise estimates of quantities by product type cannot be derived from the data collected (at field level) on nutrient contents. In addition, some calculations are based on a small number of observations. Care should be taken in interpreting these data and other sources sought for validation.

Source: British Survey of Fertiliser Practice 2006

Table SC4.1 Average fertiliser practice, North East Scotland 2006

	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	100	100	100	8	202	71	82	202	71	82	18
Spring barley	100	98	100	63	96	56	66	96	54	66	89
Winter barley	100	96	96	2	162	73	86	162	70	82	22
Oats	100	100	100	0	43	24	34	43	24	34	8
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	2
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	4
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	100	100	40	190	76	65	190	76	65	16
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	87	66	87	96	66	87	96	18
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	3
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	3
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	98	96	97	49	120	63	72	118	61	70	190
Grass under 5 years old	93	89	87	18	120	36	49	112	32	43	105
Grass 5 years and over	88	83	76	9	97	23	24	85	19	18	75
All grass	90	86	81	13	108	29	36	97	25	30	180
All crops and grass	94	91	89	31	114	47	55	107	43	49	370

Source: British Survey of Fertiliser Practice 2006

Table SC4.2 Average fertiliser practice, South East Scotland 2006

	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	94	89	94	9	87	23	44	81	21	41	10
Winter wheat	99	78	88	8	184	59	86	182	46	76	117
Spring barley	98	91	93	30	102	49	65	100	45	60	123
Winter barley	100	90	96	14	136	50	69	136	45	66	31
Oats	84	77	77	24	104	54	65	87	41	50	36
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	100	100	100	52	110	128	175	110	128	175	6
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	94	94	100	35	152	144	197	143	136	197	15
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Winter oilseed rape	100	77	86	5	178	44	64	178	34	55	34
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	49	66	92	80	66	92	80	10
Leafy forage crops	51	47	47	76	70	24	24	35	12	12	11
Arable silage/Other fodder crops	24	24	24	43	96	83	66	24	20	16	7
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	5	60	60	0	11	49	70	1	29	42	10
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	59	59	59	12	101	182	156	59	107	92	11
Soft fruit	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	93	83	87	19	136	56	77	126	47	67	440
Grass under 5 years old	78	59	60	18	94	30	36	73	18	21	127
Grass 5 years and over	59	45	40	9	70	24	28	41	11	11	113
All grass	66	50	48	12	81	27	32	54	13	15	240
All crops and grass	80	67	68	16	114	46	62	91	31	42	680

Source: British Survey of Fertiliser Practice 2006

Table SC4.3 Average fertiliser practice, South West Scotland 2006

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	-	-	-	-	-	-	-	-	-	-	3
Winter wheat	100	82	82	48	146	62	74	146	50	60	7
Spring barley	87	96	96	87	93	59	60	81	56	58	32
Winter barley	100	100	100	72	135	84	90	135	84	90	9
Oats	-	-	-	-	-	-	-	-	-	-	2
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	2
Leafy forage crops	100	100	100	81	136	41	41	136	41	41	5
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	89	92	91	81	102	62	63	91	57	58	68
Grass under 5 years old	98	88	85	54	126	33	45	124	29	38	80
Grass 5 years and over	87	82	79	45	113	31	45	98	26	35	161
All grass	89	84	80	47	116	32	45	104	27	36	241
All crops and grass	89	84	81	50	115	34	46	103	29	38	309

Source: British Survey of Fertiliser Practice 2006

Table SC5.1 Average fertiliser practice on general cropping farms, Scotland 2006

	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	93	86	91	1	84	21	41	78	18	37	10
Winter wheat	99	82	90	6	188	61	85	187	50	77	113
Spring barley	99	94	97	40	103	54	70	102	50	67	123
Winter barley	100	92	96	4	146	60	78	146	55	75	38
Oats	86	79	76	23	97	44	57	83	35	44	30
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Seed potatoes	100	100	100	27	95	148	180	95	148	180	5
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	83	83	87	43	143	139	189	119	115	165	18
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	87	92	13	187	61	65	187	53	60	47
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	35	67	90	92	67	90	92	6
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	3
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	5	60	60	0	11	49	70	1	29	42	10
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	3
Vegetable (other)	47	52	52	0	102	147	168	47	77	88	11
Soft fruit	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	86	90	22	139	60	78	131	51	70	437
Grass under 5 years old	73	64	65	13	94	34	42	68	22	27	92
Grass 5 years and over	57	44	40	6	77	24	29	44	11	12	74
All grass	65	53	52	10	86	30	37	56	16	19	166
All crops and grass	86	77	80	18	128	54	70	110	42	56	603

Source: British Survey of Fertiliser Practice 2006

Table SC5.2 Average fertiliser practice on dairy farms, Scotland 2006

	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	81	81	77	143	55	67	143	45	54	6
Spring barley	100	96	96	85	92	47	47	92	45	45	14
Winter barley	100	100	100	86	97	62	61	97	62	61	7
Oats	-	-	-	-	-	-	-	-	-	-	2
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	4
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	1
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	1
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	90	89	76	89	63	57	84	57	51	38
Grass under 5 years old	100	84	80	90	160	37	58	160	31	47	35
Grass 5 years and over	97	90	92	62	167	39	70	162	35	64	62
All grass	97	89	89	68	166	38	68	162	34	60	97
All crops and grass	97	89	89	69	156	42	66	151	37	59	135

Source: British Survey of Fertiliser Practice 2006

Table SC5.3 Average fertiliser practice on mixed farms, Scotland 2006

	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	100	87	94	18	188	79	92	188	69	87	28
Spring barley	96	96	96	64	98	59	70	94	56	67	72
Winter barley	100	96	96	22	164	72	85	164	69	82	12
Oats	84	79	79	16	85	35	49	71	28	39	13
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	3
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	96	96	65	194	56	59	194	54	57	7
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	98	57	71	122	85	71	122	83	16
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	2
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	2
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	96	94	95	54	119	64	74	114	61	70	163
Grass under 5 years old	95	83	78	22	111	34	45	105	28	35	86
Grass 5 years and over	80	71	57	15	86	30	26	68	21	15	77
All grass	86	76	66	18	97	32	35	84	24	23	163
All crops and grass	90	83	77	31	106	46	53	95	38	41	326

Source: British Survey of Fertiliser Practice 2006

Table SC5.4 Average fertiliser practice in Less Favoured Areas, Scotland 2006

	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	-	-	-	-	-	-	-	-	-	-	0
Spring barley	100	100	100	73	83	48	55	83	48	55	53
Winter barley	100	100	100	53	158	87	87	158	87	87	7
Oats	-	-	-	-	-	-	-	-	-	-	4
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	95	66	74	97	66	74	97	12
Leafy forage crops	90	62	62	88	95	31	35	86	20	22	14
Arable silage/Other fodder crops	37	37	37	55	92	59	59	34	22	22	5
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	97	95	95	76	85	54	64	82	52	61	99
Grass under 5 years old	93	83	82	26	106	33	38	99	27	32	133
Grass 5 years and over	78	72	69	25	77	24	26	60	17	18	165
All grass	82	75	72	25	86	26	30	71	20	22	298
All crops and grass	84	77	74	29	86	29	33	72	22	25	397

Source: British Survey of Fertiliser Practice 2006

SECTION D

SUPPLEMENTARY SURVEY ANALYSIS ON THE USE OF ORGANIC MANURES – GREAT BRITAIN, 2006

Introduction

General and supplementary information is collected for each farm holding that is surveyed. Whilst the British Survey of Fertiliser Practice is principally concerned with the application of manufactured fertilisers, some information on the use of organic manures is also collected each year. Since 2003 more detailed information on timing of organic manure applications has been collected and additional questions asked about imports and exports of manures.

D1. Farms handling organic manures

Organic manures applied to agricultural land may be produced on farm by livestock as slurries, farmyard manure (FYM) and poultry manures. They may also be imported from other sources such as treated sewage sludges (also called bio-solids) and some industrial 'wastes' such as paper waste or brewery effluent. Of the 1322 farmers in the survey, 918 used organic manures on at least one field on the farm, the details are shown in Table D1.1.

Table D1.1 Numbers and percentage (%) of farmers using each type of manure in Great Britain, 2006

manure type	*none*	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*other*
Number	404	751	255	33	22	31	26	38	4	72
%	31	57	19	2	2	2	2	3	0	5

Note: some farmers may use more than one type of manure

Of the 404 farmers who did not spread manure, six had had livestock manure (cattle FYM), but exported it all, so there was none left to spread. Details of manure exports are given in Table D1.2.

Table D1.2 Exported manures, Great Britain 2006

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*total*
No. of farms exporting manure type	21	7	2	1	0	0	2	0	33
Amount exported (tonnes or m^3)	24898	151265	55	1036	0	0	880	0	178135
Average per farm (tonnes or m^3)	1186	21609	28	1036	0	0	440	0	5398

Note: some farmers exported more than one type of manure

This indicates that only about 2% of the farmers surveyed exported manures and that cattle FYM is exported by more farms than any other manure. Data on manure types other than cattle FYM should be treated with caution due to the small numbers in the sample. Although the proportion of farms exporting manures remains similar to the previous year the amount per farm has increased each year since 2003 and is now nearly 5400 tonnes/m^3 per farm compared with 675 tonnes/m^3 in 2003

Of the 918 farmers who used manure, 152 had imported some/all of it; the details are given in Table D1.3. Of the 152 importing manure, 16 imported more than one type and 3 of these imported both farm manures and non-farm manures.

Table D1.3a Number of farmers importing farm manures (solids and liquids), showing quantity imported, Great Britain 2006

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*total*
No. of farms importing manure type	31	4	11	7	2	17	34	2	108
Amount imported (tonnes or m^3)	25210	1883	5905	5814	360	5295	11663	950	57080
Average per farm (tonnes or m^3)	813	471	537	831	180	311	343	475	529

Table D1.3b Number of farmers importing non-farm manures (solids and liquids), showing quantity imported, Great Britain 2006

manure type	*sewage sludge*				*composted green manure*	*other*	*total*
	digested liquid	*digested cake*	*thermally dried*	*lime stabilised*			
No. of farms importing manure type	0	25	9	16	3	10	63
Amount imported (tonnes or m^3)	0	32983	7854	25060	5750	4784	76431
Average per farm (tonnes or m^3)	0	1319	873	1566	1917	478	1213

Note: some farmers imported more than one type of manure

The amount of imported non-farm manures has increased each year since 2003. The amount per farm is similar (1213 tonnes/m^3 compared with 1070 tonnes/m^3 in 2003) but more farms are importing (63 compared with 23 in 2003). The type of non-farm manure has also changed with a decrease in the use of liquid digested from 54% of the total in 2003 down to nil in 2006 and an increase in lime stablised from 9% to 33% of total in the same period. Cattle FYM and poultry manure continued to be the farm produced manures most likely to be imported, the number of farms and overall amount imported were both slightly higher than in 2005, when 98 farms and 55190 tonnes/m^3 represented a large increase compared with the previous two years (average 65 farms and just over 29000 tonnes/m^3).

The breakdown between farm types in England and Wales compared with Scotland can be seen in Table 1.4a for cattle slurry and 1.4b for pig slurry. In Great Britain as a whole broadcasting was the most common method of application for both cattle and pig slurry (Table D1.5).

Table D1.4a **Number and percentage (%) of farms using each type of application method where cattle slurry was applied, by country and robust type, 2006**

robust farm type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
England & Wales							
Cereals	12	92	0	0	8	0	0
General cropping	6	67	33	0	0	0	0
Horticulture	3	67	0	0	0	0	33
Dairy	137	80	9	1	1	4	4
Less favoured areas	46	85	7	0	0	0	9
Sheep and cattle (lowland)	34	100	0	0	0	0	0
Mixed	28	75	7	4	0	11	4
Scotland							
Cereals	10	100	0	0	0	0	0
General cropping	11	82	9	0	0	0	9
Specialist poultry	1	100	0	0	0	0	0
Dairy	21	95	0	5	0	0	0
Less favoured areas	43	100	0	0	0	0	0
Sheep and cattle (lowland)	4	100	0	0	0	0	0
Mixed	13	92	0	0	0	0	8

Table D1.4b **Number and percentage (%) of farms using each type of application method where pig slurry was applied, by country and robust type, 2006**

robust farm type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
England & Wales							
Cereals	7	57	29	0	0	14	0
General cropping	7	100	0	0	0	0	0
Horticulture	1	0	0	0	0	0	100
Dairy	2	50	50	0	0	0	0
Less favoured areas	1	100	0	0	0	0	0
Mixed	2	100	0	0	0	0	0
Scotland							
Cereals	1	100	0	0	0	0	0
General cropping	1	100	0	0	0	0	0
Sheep and cattle (lowland)	1	100	0	0	0	0	0
Mixed	1	100	0	0	0	0	0

Table D1.5 **Number and percentage (%) of farms using each type of application method, by slurry type for Great Britain, 2006**

slurry type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry	369	87	5	1	1	2	4
Pig slurry	24	79	13	0	0	4	4
Both	4	50	25	0	0	0	25
Total	393	86	6	1	1	2	4

Assessment of how often organic manures are incorporated into the soil is complicated by the fact that some farmers make more than one application or apply more than one type of manure and may incorporate each of these differently. About 30% of fields receiving manures get more than one application and 71% of the multiple applications are made to grass. Table D1.6 shows the best estimate of incorporation using information recorded for the current season. Farmers with FYM and poultry manure are most likely to incorporate at least some of it. Conversely cattle slurry (which tends to be applied to grassland) is least likely to be incorporated. Incorporation takes place on nearly 60% of the area receiving poultry manure (possibly because of the restriction imposed on poultry manure applications in some areas). Details about how quickly manures were incorporated (Table D1.7) shows that 65% of poultry manure is incorporated within 24 hours, whilst only 18% of FYM, 33% of cattle slurry and 37% of pig slurry is incorporated this quickly.

Table D1.6 Degree of incorporation of organic manures/slurries applied in current season, Great Britain 2006

manure type	*% farms where a proportion of manure/slurry type is incorporated*	*% of manure type incorporated* [a]	*% area of incorporated manure/slurry* [b]
FYM	60	49	34
Poultry manure	60	65	59
Cattle slurry	21	17	11
Pig slurry	41	64	38

Table D1.7 Frequency of incorporation time by manure/slurry type, Great Britain 2006

manure type	*percentage of farms incorporation time*			
	</= 6 hours	*6-24 hours*	*1 day - 1 week*	*> 1 week*
FYM	2	16	61	20
Poultry manure	16	49	23	13
Cattle slurry	7	26	44	24
Pig slurry	0	37	43	20
Other slurry	26	37	31	5

Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor (Table D1.8). Farmers with poultry manure were most likely to use a contractor to apply at least some of their manure and this represents nearly 40% of the total poultry manure applications. Farmers with pig slurry were least likely use a contractor.

Table D1.8 Use of contractors to spread manure/slurry in current season, Great Britain 2006

manure type	*% farms using a contractor for a proportion of all applications*	*% of manure type applied by contractor* [a]	*% area applied by contractor* [b]
FYM	28	21	21
Poultry manure	49	37	36
Cattle slurry	30	24	26
Pig slurry	23	21	18

[a] Based on field numbers with no weighting for field size or application volume

[b] No allowance for has been made for the volume applied in calculation of the area

D2. Use of organic manures

At a field level, farmers were asked about how often fields received organic manures. Of the 7000 fields belonging to farms who used manures, 2081 fields (30%) never received manure. For those that had received manure in the past, the average frequency of application is shown in Table D2.1.

Table D2.1 Average number of years between organic manure applications, Great Britain 2006

	1 year	*2 years*	*3 years*	*4 years*	*5 years*	*6 years*	*>6 years*	*never*	*don't know*
% of fields	14	6	7	9	6	5	15	30	7

For the 2626 fields that received organic manures in the 2005/06 season, data were collected on what type was applied. The proportion of fields receiving each of the main types of manure is shown in Table D2.2.

Table D2.2 Percentage of fields receiving each organic manure type, Great Britain 2006

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*other*
%	54	29	2	3	2	2	2	1	5

Note: some fields may receive more than one type of manure

The rate of application of manure was described as low, medium or high using the guidelines in Table D2.3 and the results are shown in Table D2.4.

Table D2.3 Typical rates of manure application, Great Britain 2006

manure type	*units*	*typical application rates*		
		low	*medium*	*high*
manure:				
pig	t/ha	<15	15-30	>30
cattle/sheep	t/ha	<15	15-30	>30
poultry layer	t/ha	<6	6-11	>11
broiler/turkey litter	t/ha	<4	4-7	>7
slurry:				
pig	m^3/ha	<25	25-45	>45
dairy/beef/sheep	m^3/ha	<35	35-65	>65
sewage sludge:				
liquid digested	m^3/ha	<55	55-100	>100
cake digested	t/ha	<15	15-25	>25
thermally dried	t/ha	<4	4-7	>7
lime-stabilised	t/ha	<15	15-25	>25
other:				
strainer box	m^3/ha	<70	70-135	>135
weeping wall	m^3/ha	<55	55-100	>100
dirty water	m^3/ha	<440	440-800	>800

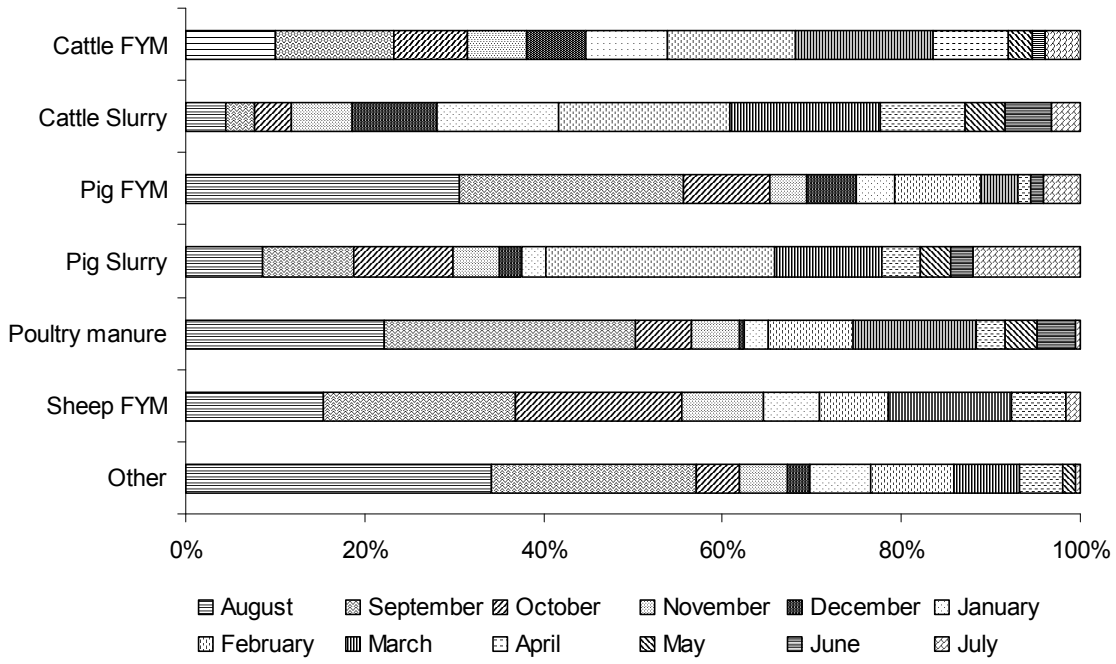
Table D2.4 Number of fields receiving low, medium or high rates of each organic manure type, Great Britain 2006

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep manure*	*layer manure*	*duck manure*	*broiler / turkey manure*	*other*	*total*
Low	881	597	20	38	22	37	1	50	83	1729
Medium	1112	515	49	53	43	34	13	28	74	1921
High	241	97	3	26	0	7	8	11	34	427
Total	2234	1209	72	117	65	78	22	89	191	4077

Over all manure types, over 40% of applications were described as low and nearly 50% as medium. Of the individual manure types, duck manure and pig slurry were most likely to be applied at high rates (36% and 22% respectively).

The time of year when manure was applied is shown in Figure D2.1. Excluding cattle manures and pig slurry, most fields received manures in the autumn (August to October). For cattle and pig slurry, more applications were made in January to March.

Figure D2.1 Percentage of fields in Great Britain receiving each organic manure type by month, 2006



D3. Fertiliser value of organic manures

Organic manures are valuable sources of the major plant nutrients (nitrogen, phosphorus and potassium) and where used, applications of manufactured fertiliser can be reduced[16]. In the Survey, farmers were not asked directly whether they had made an adjustment to fertiliser inputs because of manure use, however an indication of possible adjustments has been derived by comparing fields that received manure with those that did not. Table D3.1 shows the overall fertiliser rates for the main tillage crops in Great Britain with and without manure inputs. (Organic farms, which use no mineral fertilisers, have been excluded from the Tables D3.1 and D3.2.).

Table D3.1 Overall field rate of fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2006

	nitrogen		*phosphate*		*potash*		*number of fields*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
Winter wheat	167	197	19	37	37	42	319	1633
Spring barley	102	101	49	33	60	61	223	428
Winter barley	114	141	35	38	51	54	119	471
2nd early or maincrop potatoes	136	152	90	156	174	225	56	61
Sugar beet	83	109	19	45	76	128	69	131
Spring oilseed rape*	96	167	26	30	43	64	3	24
Winter oilseed rape	181	193	25	35	37	37	82	474
Field peas (harvested dry)*	4	1	8	29	15	27	5	45
Field beans (harvested dry)	1	3	11	19	28	27	12	165
Forage maize	52	58	43	20	38	84	156	18

* Note small number of fields

For some crops, the application of organic manures had an effect on whether fields received phosphate or potash fertiliser, the dressing covers reducing by about 20% (phosphate) and 6% (potash) for winter wheat and potatoes. There was less impact on dressing cover for nitrogen with a 2% reduction for winter wheat and 4% for potatoes.

In terms of overall application rate there was a reduction in fertiliser applications where manures were used for most crops. The number of field receiving manures was small for spring oilseed rape (3) and peas (5) and these data should be treated with caution. As in previous years there are more forage maize fields receiving organic manures than without. Excluding spring oilseed rape, the largest nitrogen reduction occurred with winter wheat, winter barley and sugar beet. The largest reduction in phosphate and potash use occurred with potatoes.

Data for grassland are presented separately because grass is managed differently according to the amount of production required. Thus, intensive milk production requires large volumes of grass and is likely to receive higher inputs of both manure and mineral fertilisers than beef or sheep systems. Table D3.2 shows the average field rate of fertiliser applied to grassland in different management systems (as defined by the 'Robust farm types') with and without applications of manure. Average field rates have been used for grassland because grass fields often receive no mineral fertiliser, not because of manure use, but because the amount of grass production required does not warrant fertiliser input.

[16] Anon. (2000). *Fertiliser Recommendations for Agricultural and Horticultural Crops.* MAFF Reference Book 209 (Seventh edition). The Stationery Office, London..

Table D3.2 Average field rate of fertiliser application on grassland in England & Wales and in Scotland, with and without applications of organic manure, 2006

	nitrogen		*phosphate*		*potash*		*number of fields*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
England & Wales								
Dairy								
Grass less than five years old	158	132	31	23	57	34	123	44
Grass five years and over	128	125	28	27	40	28	293	133
All grass	134	126	29	26	44	29	416	177
Cattle and sheep								
Grass less than five years old	110	145	28	36	39	46	78	51
Grass five years and over	73	62	23	24	27	25	327	334
All grass	78	69	23	25	28	27	405	385
Other livestock/mixed								
Grass less than five years old	120	139	25	34	45	61	51	95
Grass five years and over	111	92	32	29	42	34	77	182
All grass	114	103	30	30	43	40	128	277
Scotland								
Dairy								
Grass less than five years old*	162	142	39	29	62	32	29	6
Grass five years and over	185	140	45	29	78	58	44	18
All grass	178	140	43	29	74	57	73	24
Mixed								
Grass less than five years old	143	103	39	33	51	43	18	68
Grass five years and over	101	83	33	29	31	25	18	59
All grass	124	92	36	31	42	34	36	127

* Note small number of fields

In England & Wales, 70% of all grass fields in the dairy sector had received applied manure. The average rate of nitrogen, phosphate and potash fertiliser was higher in the fields where manures were used. On cattle and sheep farms, 51% of all grass fields received manure compared with 32% on mixed livestock farms, the latter being a large increase from 27% in 2005. For both these farm types the average rates of all nutrients were reduced where manures had been used on short term grass.

In Scotland, (as in England & Wales) fields on dairy farms are more likely to receive applied manure than those on other farm types, with 75% of grass fields on dairy farms receiving manure compared with 22% on mixed farms. Irrespective of farm type, mineral fertiliser inputs were consistently higher on those fields that had received manure.

As so many fields on dairy farms receive manure, a separate analysis was carried out to examine the influence of grass management (Table D3.3). This shows that in both England & Wales and Scotland fields cut for silage are most likely to receive manures, 82% and 88% respectively compared with 69% and 72% for grazed grass. In England & Wales, smaller dressings of

phosphate fertiliser were made to silage fields where manure had been applied. In Scotland, only grazed grass had sufficient fields with and without manure for comparison, indicating the average rate of mineral fertiliser applied was higher in the presence of manure.

Table D3.3 Average field rate of fertiliser application on dairy grassland in England & Wales and in Scotland, with and without applications of organic manure, 2006

	nitrogen		*phosphate*		*potash*		*number of fields*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
England & Wales								
All hay	86	84	30	21	41	24	42	15
All silage	139	118	30	26	50	38	246	55
All grazings	136	129	28	25	43	27	383	169
Scotland								
All hay*	127	0	28	0	27	0	3	0
All silage*	194	139	47	32	90	48	43	6
All grazings	180	140	45	29	78	59	57	22

* Note small number of fields

In recent years there has been a great deal of promotional activity aimed at encouraging farmers to make adjustments to fertiliser inputs where manures are used. Thus, some of the differences between mineral fertiliser inputs categorised as with or without manures are less than might have been expected, although the extent to which individual farmers have accounted for the nutrients in the manures cannot be judged from these data. However, when making these comparisons there are a number of factors which should be taken into account:

- the data presented for 'with/without' manure are not a paired comparison of otherwise identical fields,
- fields which have not received manures may be on farms which have no manure and are thus managed in a different way,
- in grassland systems, fields which have not received manures may be managed differently (e.g. grazed only) compared with manured field which may be cut more than once as well as grazed,
- for tillage crops, the overall fertiliser rate means that some fields are included which have received no fertiliser. For the 'with manure' data, it may indicate that the manure was judged to supply all the fertiliser which was required,
- for grassland, the average fertiliser rate has been used so as to avoid distorting the data by inclusion of 'unmanaged' grass, which receives no fertiliser, although this has the effect of excluding any fields on which no fertiliser was applied because the manure was considered sufficient, thus obscuring a substitution effect,
- the dataset of fields where manures are used includes fields which may have received only a very small amount of manure (see section D2). On those fields receiving large dressings, there may be a greater adjustment in mineral fertiliser,
- where reductions in phosphate and potash fertiliser have not been made, this may indicate a desire to build up soil reserves of these nutrients,
- over a third of cattle/pig FYM applications were reported as <15 t/ha and over a third were applied in the autumn. A 15 t/ha dressing of cattle FYM applied to cereal stubble in the autumn will only supply 5-9 kg/ha of available nitrogen depending on soil type.

D4. Spreading precision and record keeping

Precision in spreading both fertilisers and manures is important both for profitability and to minimise pollution. Farmers were asked a series of questions about the care taken in application of fertilisers and manures and in record keeping. The results are presented in this section.

Nearly 45% of farmers check the accuracy of mineral fertiliser spreaders with catch trays on an annual basis (Table D4.1), with 7% checking at each change of fertiliser type. The number checking annually has increased from 32% in 2004 and 41% in 2005. Seventy three percent of farmers took active measures to prevent contamination of water courses, ditches and hedgerow bottoms when spreading mineral fertiliser, this compares with 68% in 2005.

Table D4.1 Frequency of spread pattern checks using a catch tray, Great Britain 2006

response	*percentage*
It is factory set and doesn't need checking	9
At each change of fertiliser type	7
Once a year	44
Less than once a year	10
Never checked	16
Other	14
Not answered	2

Farm diaries were the most common methods for recording both fertiliser and manure use (Table D4.2). No fertiliser records were kept on 7% of farms; this compares with 10% in 2005, 18% in 2004 and 22% in 2001 when this question was previously asked in the survey.

Table D4.2 Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2005-06 crop year in Great Britain

method	*applied fertiliser*		*applied organic manure*	
	number	*percentage*	*number*	*percentage*
Farm diary	445	28	274	32
Farm notebook	278	17	128	15
File record sheet	340	21	185	22
Computer program	369	23	154	18
No records kept	105	7	86	10
Other	60	4	31	4
Total farms	1597		858	

Note: more than one method may be used

APPENDIX 1 - SURVEY STATISTICS

App 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2005

Great Britain

	standard error for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	2.5	2.8	1.5	1.3	1.7	2.3	2.4	5.1	1.3	1.8	1964
oilseed rape	3.3	3.6	1.7	1.7	2.2	3.2	3.3	4.2	1.7	2.4	583
winter barley	2.6	3.1	1.9	1.9	2.3	2.4	2.6	4.5	1.9	2.2	591
spring barley	2.7	2.6	2.7	2.5	7.7	2.6	2.5	3.9	3.1	9.8	654
m/c potatoes	9.2	7.9	9.5	10.0	12.6	8.6	12.4	9.0	9.5	11.9	98
sugar beet	5.2	4.3	3.1	4.1	9.2	5.0	3.7	13.1	5.7	10.2	200
all tillage crops	2.1	2.4	1.5	1.3	1.7	2.1	2.2	2.5	1.6	2.2	5361
all grass	2.0	1.5	1.4	0.5	0.7	2.0	2.5	2.5	1.1	1.4	3318

England & Wales

	standard error for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	2.6	3.0	1.5	1.3	1.7	2.4	2.5	5.5	1.4	1.9	1817
oilseed rape	3.5	3.8	1.7	1.8	2.4	3.4	3.5	5.2	1.9	2.7	525
winter barley	2.8	3.4	1.9	2.0	2.5	2.6	2.9	4.6	2.2	2.5	527
spring barley	4.0	3.4	4.1	3.8	12.6	3.9	3.0	9.1	6.3	19.0	392
m/c potatoes	9.3	9.6	10.0	11.5	14.3	8.9	12.5	9.3	11.1	13.8	78
sugar beet	5.2	4.3	3.1	4.1	9.2	5.0	3.7	13.1	5.7	10.2	200
all tillage crops	2.5	2.6	1.7	1.6	2.0	2.4	2.3	3.5	2.1	2.8	4624
all grass	2.3	1.8	1.5	0.6	0.8	2.5	2.8	3.4	1.5	1.8	2594

Scotland

	standard error for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	7.6	8.8	6.1	3.7	4.9	7.5	7.6	12.3	2.9	4.4	147
oilseed rape	9.4	9.9	5.4	4.4	5.3	9.4	8.3	6.4	3.9	5.0	58
winter barley	6.6	7.6	7.2	4.3	4.8	6.6	6.0	11.8	3.7	4.3	64
spring barley	3.1	3.7	2.6	1.8	2.6	3.0	4.2	2.4	1.6	2.5	262
m/c potatoes	25.9	4.3	25.1	21.3	25.2	25.2	10.4	23.6	17.8	22.1	20
all tillage crops	3.8	4.2	2.5	1.9	2.5	3.6	4.9	2.7	2.1	2.5	737
all grass	3.9	2.9	3.3	1.1	1.4	3.6	5.1	3.2	1.2	1.9	724

App 1.2 ESTIMATING THE STANDARD ERROR

The standard errors quoted in Table App 1.1 are a measure of the standard deviation of the mean, and are used to judge the accuracy of the results for each cell in the table. This is a standard statistical process where the standard deviation of each cell is calculated first and than divided by the square root of the number of data points within that cell. Approximate 95% confidence limits will be the quoted value +/- 2 standard errors.

App 1.3 AN ALTERNATIVE APPROACH TO ESTIMATION OF OVERALL RATES

It is in the nature of random sampling that the characteristics of each achieved sample will differ in several respects from one another, and from the underlying population. In particular, the proportion of different crops grown will differ in the achieved sample from that in the population. The method of adjustment used here in these alternative estimates attempts to counter this by 'post-stratifying' or 'weighting' by the distribution of area of the major crops reported to the Agricultural Census (June 2005).

Table App 1.2 Re-estimation of overall total fertiliser use (kg/ha) in Great Britain, 2005

		straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
all tillage		128	18	147	35	49
	revised estimate	124	19	143	36	50
all grass		28	44	72	16	21
	revised estimate	28	44	72	16	20
all crops and grass		74	32	107	25	34
	revised estimate	68	33	101	24	33

App 1.4 RESPONSE RATE

Tables App 1.3 and App 1.4 summarise information regarding the response received to the main and reserve samples.

Table App 1.3 Response to main and reserve samples in 2006

	2006	*% total*
Issued from main sample	1497	100
Non-response [a]	371	25
Response to main sample	1126	75
Issued from reserve sample 1	371	25
Non-response [a]	270	18
Response to reserve sample 1	101	7
Issued from reserve sample 2	270	18
Non-response [a]	205	14
Response to reserve sample 2	65	4
Issued from reserve sample 3	205	14
Non-response [a]	175	12
Response to reserve sample 3	30	2
Achieved sample response	1322	88

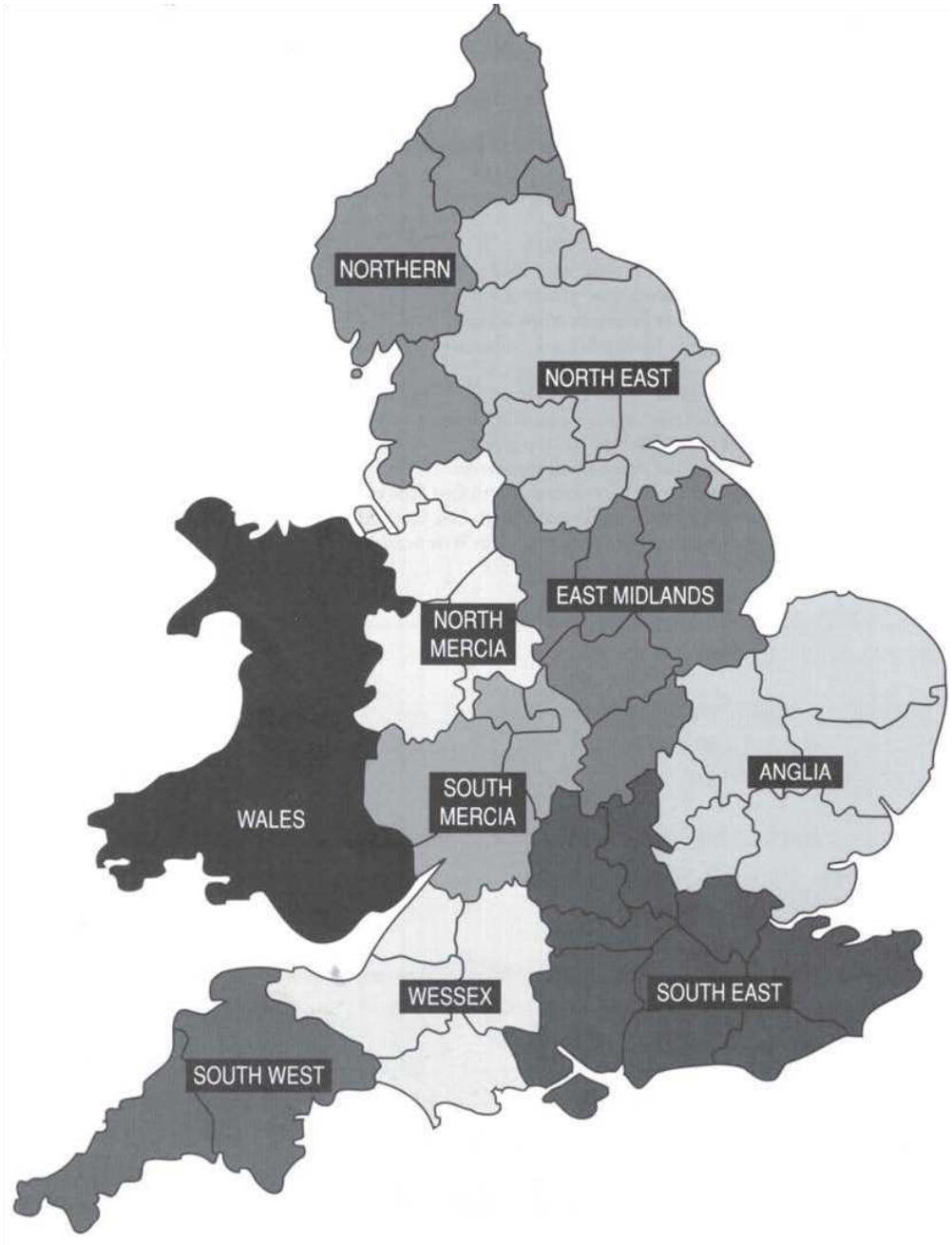
Table App 1.4 Response to main and reserve samples for 2002-2006

Net response rate	*2002 %*	*2003 %*	*2004 %*	*2005 %*	*2006 %*
Overall achieved rate	91	84	84	89	88
Refusal rate [a]	9	16	16	11	12
Main sample	77	71	87	85	85
Reserve sample(s)	23	29	13	15	15
Main reason for refusal	*2002 %*	*2003 %*	*2004 %*	*2005 %*	*2006 %*
Too busy	31	38	23	35	30
Not interested	9	16	7	13	10
Do not do surveys	5	10	4	6	8
Want payment	1	1	1	2	2
Too much paperwork	1	3	1	3	2
Other [a]	54	32	64	41	48

[a] Includes non-contact.

APPENDIX 2

App 2.1 BSFP REGIONS[17] IN ENGLAND AND WALES



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

App 2.2 COMPARISON OF BSFP AND DEFRA COUNTIES

Approximate English counties within BSFP and Defra Regions[18]

BSFP REGIONS

NORTHERN

8	Cumbria
21	Lancashire
31	Northumberland
30	Tyne and Wear

NORTH-EAST

4	Cleveland
12	Durham
51	East Ridings of Yorks and N Lincs
50	North Yorkshire (Beverley)
48	North Yorkshire (Northallerton)
47	South Yorkshire
49	West Yorkshire

NORTH MERCIA

6	Cheshire
44	Greater Manchester
25	Merseyside
35	Shropshire
37	Staffordshire

SOUTH MERCIA

14e	Gloucestershire
17	Hereford and Worcester
43	Warwickshire
46s	West Midland

EAST MIDLANDS

9	Derbyshire
22	Leicestershire
24	Lincolnshire
29	Northamptonshire
32	Nottinghamshire

ANGLIA

1	Bedfordshire
5	Cambridgeshire
13	Essex
18	Hertfordshire
28	Norfolk
38	Suffolk

SOUTH-EAST

2	Berkshire
3	Buckinghamshire
41	East Sussex
26/27	Greater London
15	Hampshire
16	Isle of Wight
20	Kent
33	Oxfordshire
40	Surrey
42	West Sussex

WESSEX

11	Dorset
34	N Somerset and S Gloucestershire
36	Somerset
45	Wiltshire

SOUTH-WEST

7	Cornwall
10	Devon

DEFRA REGIONS

NORTHERN

4	Cleveland
8	Cumbria
12	Durham
51	East Riding of Yorks and N Lincs
50	North Yorkshire (Beverley)
48	North Yorkshire (Northallerton)
47	South Yorkshire
30	Tyne and Wear
49	West Yorkshire

MIDLANDS & WESTERN

6	Cheshire
9	Derbyshire
44	Greater Manchester
17	Hereford and Worcester
21	Lancashire
22	Leicestershire
25	Merseyside
32	Nottinghamshire
35	Shropshire
37	Staffordshire
43	Warwickshire
46	West Midlands

EASTERN

1	Bedfordshire
5	Cambridgeshire
13	Essex
26	Greater London(E)
18	Hertfordshire
24	Lincolnshire
28	Norfolk
29	Northamptonshire
38	Suffolk

SOUTH-EASTERN

2	Berkshire
3	Buckinghamshire
41	East Sussex
27	Greater London (SE)
15	Hampshire
16	Isle of Wight
20	Kent
33	Oxfordshire
40	Surrey
42	West Sussex

SOUTH-WESTERN

7	Cornwall
10	Devon
11	Dorset
39	Isles of Scilly
34	N Somerset and S Gloucestershire
36	Somerset
45	Wiltshire

[18] Defra Statistics Dept, Foss House, York and Office for National Statistics (ONS) Geography User Guide, http://www.ons.gov.uk

App 2.3 ENGLISH COUNTIES WITHIN BSFP AND DEFRA REGIONS

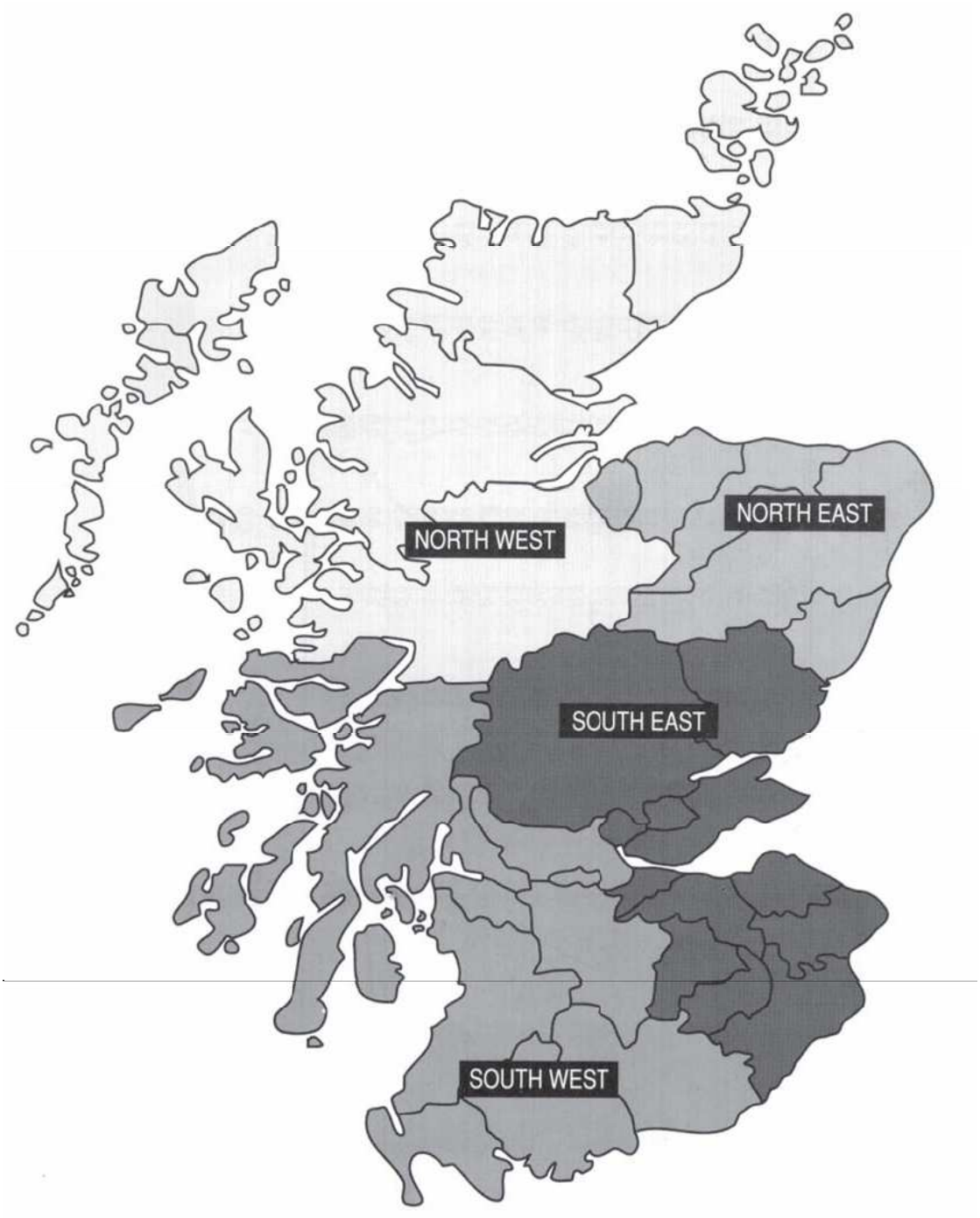
List of English counties indicating the BSFP and Defra Regions[19] within which they fall

	County	BSFP REGION	DEFRA REGION
1	Bedfordshire	Anglia	Eastern
2	Berkshire	South-East	South-Eastern
3	Buckinghamshire	South-East	South-Eastern
4	Cleveland	North-East	Northern
5	Cambridgeshire	Anglia	Eastern
6	Cheshire	North Mercia	Midlands & Western
7	Cornwall	South-West	South-Western
8	Cumbria	Northern	Northern
9	Derbyshire	East Midlands	Midlands & Western
10	Devon	South-West	South-Western
11	Dorset	Wessex	South-Western
12	Durham	North-East	Northern
13	Essex	Anglia	Eastern
14	Gloucestershire	South Mercia	South-Western
15	Hampshire	South-East	South-Eastern
16	Isle of Wight	South-East	South-Eastern
17	Hereford & Worcester	South Mercia	Midlands & Western
18	Hertfordshire	Anglia	Eastern
20	Kent	South-East	South-Eastern
21	Lancashire	Northern	Midlands & Western
22	Leicestershire	East Midlands	Midlands & Western
24	Lincolnshire	Eastern	East Midlands
25	Merseyside	North Mercia	Midlands & Western
26/27	Greater London(E)	South-East	Eastern
28	Norfolk	Anglia	Eastern
29	Northamptonshire	East Midlands	Eastern
30	Tyne and Wear	Northern	Northern
31	Northumberland	Northern	Northern
32	Nottinghamshire	East Midlands	Midlands & Western
33	Oxfordshire	South-East	South-Eastern
34	N Somerset and S Gloucestershire	Wessex	South-Western
35	Shropshire	North Mercia	Midlands & Western
36	Somerset	Wessex	South-Western
37	Staffordshire	North Mercia	Midlands & Western
38	Suffolk	Anglia	Eastern
39	Isles of Scilly		South-Western
40	Surrey	South-East	South-Eastern
41	East Sussex	South-East	South-Eastern
42	West Sussex	South-East	South-Eastern
43	Warwickshire	South Mercia	Midlands & Western
44	Greater Manchester	North Mercia	Midlands & Western
45	Wiltshire	Wessex	South-Western
46	West Midlands	South Mercia	Midlands & Western
47	South Yorkshire	North-East	Northern
48	North Yorkshire (Northallerton)	North-East	Northern
49	West Yorkshire	North-East	Northern
50	North Yorkshire (Beverley)	North-East	Northern
51	East Riding of Yorks and North Lincs	North-East	Northern

[19] Defra Statistics Dept, Foss House, York and Office for National Statistics (ONS) Geography User Guide, http://www.ons.gov.uk

APPENDIX 3

App 3.1 BSFP REGIONS[20] IN SCOTLAND



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

APPENDIX 4

App 4.1 UK FARM CLASSIFICATION SYSTEM

UK farm classification system (Revised 2004): composition of robust, main and other types by constituent EC type. [21]

Robust types	Main types		Constituent EC types [a]
1 Cereals	1	Cereals	[1312]
2 General Cropping	2	General Cropping	[1412], 142, 143, [1443], 602, 603, 604, [6052]
3 Horticulture	3	Specialist fruit	3211
	4	Specialist glass	2012, 2022, 2032
	5	Specialist Hardy Nursery Stock	[3401]
	6	Other horticulture	2011, 2013, 2021, 2023, 2031,2033, 2034, 311, 312, 313, 314, [3402], 601, 6061, 6062
4 Specialist Pigs	7	Specialist pigs	5011, 5012, 5013
5 Specialist Poultry	8	Specialist poultry	5021, 5022, 5023
6 Dairy	9	Dairy (LFA)	411, 412 (LFA)
	10	Dairy (lowland)	411, 412 (non-LFA)
7 LFA Grazing Livestock	11	Specialist sheep (SDA)	441 (SDA)
	12	Specialist beef (SDA)	421,422 (SDA)
	13	Mixed Grazing Livestock(SDA)	431, 432, 442, 443, [4443], [4444] (SDA)
	14	Various Grazing Livestock (DA)	421, 422, 431, 432, 441, 442, 443, [4443], [4444] (DA)
8 Lowland Grazing Livestock [b]	15	Various Grazing Livestock (lowland)	421, 422, 431, 432, 441, 442, 443, [4443], [4444] (non-LFA)
9 Mixed	16	Cropping and dairy	811, 812
	17	Cropping, cattle and sheep	[8132], [8142]
	18	Cropping, pigs and poultry	821
	19	Cropping and mixed livestock	822, 8232
	20	Mixed livestock	5031, 5032, 711, [7122], 721, 722, 723
10 Other [c]	21	Specialist set-aside	[1311]
	22	Specialist grass and forage	[1411], [1444], [4442], [6051], [7121], [8131], [8141]
	23	Specialist horses	[4441]
	24	Non-classifiable holdings: fallow	[91]
	25	Non-classifiable holdings: other	[92]

[a] 2004 EC Typology described in Commission Decision 85/377/EEC as amended by Commission Decisions 94/376/EC, 96/393/EC and 99/725/EC with minor modifications to adapt it to United Kingdom conditions. For a full list of EC types see here. These minor modifications are indicated by the EC farm type number being shown in square brackets. Definitions for these modified EC farm types are available from Defra Farm and Animal Health Economics Division, Ergon House, Horseferry Road, London SW1P 2AL EC types 132, 133, 1441, 1442, 3212, 3213, 322, 323, 330, and 8231 have not been allocated in the classification, since these types of production do not occur in the United Kingdom at a significant level.

[b] Definitions of LFA (Less Favoured Area), lowland, SDA (Severely Disadvantaged Area), and DA (Disadvantaged Area) farms are available on request from: Defra Farm and Animal Health Economics Division, Ergon House, Horseferry Road, London SW1P 2AL.

[c] Not included in the British Survey of Fertiliser Practice.

[21] http://statistics.defra.gov.uk/esg/pdf/farmclass.pdf