THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2005

First published 2006

British Library Cataloguing in Publication Data.

A catalogue record for this book is available from the British Library.

ISBN 978 0 9552569 1 2 (from January 2007)

ISBN 0 9552569 1 7

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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 2005 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 2005, the Survey was co-ordinated by Kynetec Ltd., who were responsible for the survey design, statistical analysis and quality control monitoring.

May 2006

ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2005 British Survey of Fertiliser Practice.

The authors of the report wish to thank all those involved for their assistance and support in the design, conduct and analysis of the Survey.

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 2005 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 2005 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 2004/2005 cropping season are also discussed in the report.

Nitrogen

- The total nitrogen use on all crops and grassland declined slightly to 109 kg/ha in 2005 from 110 kg/ha in 2004. This decline is associated with falls in the application of straight nitrogen to tillage land and of compound nitrogen to grassland. Conversely, the use of straight nitrogen on grassland has actually increased slightly whilst levels of compound nitrogen on tillage land have remained unchanged.

- On arable crops the overall total nitrogen use (150 kg/ha) fell slightly from the 2004 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 sugar beet and winter oilseed rape in 2005. However, it rose slightly for spring oilseed rape and maincrop/second early potatoes.

- Overall total nitrogen use on grassland continued to show a decline with a drop of 3 kg/ha from the previous year. This decline was due to a drop in the area of grassland where nitrogen was applied for both straight and compound nitrogen. The average application rates of nitrogen on grassland remained unchanged. The total nitrogen rate (77 kg/ha) was the same as 2004, which was the lowest reported for both the last five years (mean: 88 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 2005 fell by 1 kg/ha compared to last year, matching the 2003 rate at 40 kg/ha, which was the lowest rate for the period. Phosphate use on grassland also decreased by the same degree compared with the previous year to 16 kg/ha and represents the lowest rate for the period. Phosphate use on all crops and grassland is now at its lowest point for the last 5 years, at 27 kg/ha. This is partly due to a fall in the area of tillage crops (65%) and grassland (55%) receiving phosphate fertiliser compared to previous years (five year means: 63% and 55% respectively).

Potash

- Potash use on tillage crops decreased slightly (-2 kg/ha) to 53 kg/ha in 2005. The overall rate of potash on grassland fell by the same amount in 2005 to 20 kg/ha, the lowest level ever recorded. In the same period, potash use on all crops and grassland has dropped by 2 kg/ha, to 35 kg/ha. The area of tillage crops receiving potash fertiliser fell slightly to 65% (five year mean: 65%), and the area of grassland receiving potash fertiliser also dropped slightly to 55% (five year mean: 55%).

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 2005 the underlying upward trend in the average application rates of the last 5 years continued for cereals, despite a fall in the average rate for spring barley compared to last year. The average rate for oilseed rape declined by 3 kg/ha to 82 kg/ha comapared to 2004 which was the highest ever recorded. 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 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: 111 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 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, 46 kg/ha in 1998-2002 and 40 kg/ha in the period 2003-2005. 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 2003-05. The 2005 rate of 40 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 54 kg/ha between 2003-2005. 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 2005. 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 2003-2005 (mean: 21 kg/ha) has been consistently lower than in earlier years and the value of 20 kg/ha in 2005 represents 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 Annual 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 2005 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, 2003.

[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.

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[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. *Proceedings No. 437*. York: The International Fertiliser Society.

A2 SURVEY METHODOLOGY

A2.1 SAMPLE

The basis of the sample framework is the June Agricultural Survey (previously the Agricultural Census) 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 fraction 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 surveys by other departments of Defra. 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 2005 survey, England & Wales

	farm holdings in population in 2004	total crops and grass in 2004 (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	17582	7.1	0.52	91	87	0.49
51-100 ha	15108	12.1	1.05	154	147	0.97
101-200 ha	7848	12.7	2.06	157	148	1.89
200+ ha	2623	11.9	3.39	87	78	2.97
Crops & mixed						
(Robust types: cereals, general cropping, mixed)						
crops & grass area						
20-50 ha	8944	3.7	0.53	47	45	0.50
51-100 ha	9645	8.5	1.14	110	93	0.96
101-200 ha	8931	15.2	2.24	200	176	1.97
200+ ha	6389	27.9	5.62	359	284	4.45
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	782	0.3	1.41	11	8	1.02
51-100 ha	247	0.2	3.24	8	8	3.24
101-200 ha	130	0.2	6.15	8	7	5.38
200+ ha	40	0.2	17.50	7	6	15.00
Total for England & Wales	77269	100.0		1239	1087	1.41

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 2004*.

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2004*.

Table A2.2 Derivation of the stratified random sample for the 2005 survey, Scotland

	farm holdings in population in 2004	total crops and grass in 2004 (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	1151	2.4	0.52	6	5	0.43
51-100 ha	1531	7.0	1.11	17	18	1.18
101-200 ha	1446	12.8	2.21	32	31	2.14
200+ ha	694	14.0	5.04	35	33	4.76
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & low ground), mixed)						
crops & grass area						
20-50 ha	3269	6.9	0.52	17	17	0.52
51-100 ha	3509	6.9	1.14	40	40	1.14
101-200 ha	2649	22.7	2.15	57	56	2.11
200+ ha	970	18.4	4.74	46	44	4.54
Total for Scotland	15219	100.0		250	244	1.60

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2005. 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 2005 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 2005 the 1,331 farms recorded represented almost two and a half per cent of the total crops and grass area in Britain. This equated to over 10,000 fields and nearly 20,000 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 2004.*

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2004.*

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 2004 to autumn 2005, corresponding to the 2005 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 2004. 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 recorded in the survey.

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; $\mathbf{P_2O_5}$ for phosphate; $\mathbf{K_2O}$ for potash, $\mathbf{SO_3}$ 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 split the robust types 'Specialist Pigs' and 'Specialist Poultry' were amalgamated as the single robust type 'Pigs and Poultry'. Rather than risking under-representation of either of these farm types in the sampling design the Authority decided that for the 2005 survey, the pre-2004 classifications would continue to be adopted. 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[9]. 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 2003/04 and 2004/05, 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 2005, of which 4.5 million hectares (43%) were cultivated for tillage cropping and the remainder, 6.0 million hectares, were grassland (excluding rough grazing).

The area of set aside and thus total tillage area remained largely unchanged in 2005. However, within the total tillage area there was a large increase in the area of bare fallow, which is thought to be related to the introduction of the Single Farm Payment. The area of wheat decreased by 122,807 ha (-6%). The area of barley decreased by 68,691 ha (-17%) and 224779 (-40%) for the winter and spring crops respectively, with the result that the areas of winter and spring sown crops are now very similar. The total cereal area was down by 6.7% after a 2.4% increase the previous year. The total oilseed rape area increased by 20,755 ha (+4%), with a higher proportion of the crop (94%) being autumn sown compared with 2004. The linseed area increased significantly (+54%) compared with the previous year, but still represents only 1% 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 (-4%), which is the fourth year in a row that the area has declined. Forage maize and other forage crops increased by 10.5%. Other tillage crop categories and the total area of managed grassland showed only small changes in area, compared with 2004.

The total tillage area was 116,452 ha less (-2.5%) in 2005, compared to 2000. The total area of cereals was reduced (–12.6%), with changes in the areas of wheat (-11%) and barley (-37%) in 2005 compared with 2000. The oilseed rape area was higher (+56%), as was the area of peas/beans (+15%) and forage crops (+23%). The areas of sugar beet and potatoes were down by 14% and 9% respectively in 2005 compared with 2000.

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 too early to

say what impact these new schemes will have on fertiliser use. However as one potential impact is that margins of fields will remain un-cropped, all calculations of fertiliser rates have, for the first time, been made on the basis of 'sown' area for this report.

Table A3.1 Cropping and grassland areas ('000 ha) in Great Britain, 2003/04 – 2004/05

Crops	2003/2004 '000s ha	2004/2005 '000s ha	% change since 2003/04	% change since 1999/00	2004/2005 crop areas as % of total tillage area
Wheat	1982	1860	-6.2	-10.6	41.0
Barley – winter	415	346	-16.6	-40.7	7.6
– spring	565	340	-39.8	-33.6	7.5
Total cereals[1]	*3095*	*2889*	*-6.7*	*-12.6*	*63.7*
Oilseed rape – total	498	519	4.2	56.2	11.4
Sugar beet	154	148	-3.9	-14.4	3.3
Potatoes[2]	141	132	-6.3	-8.6	2.9
Linseed	29	45	53.6	-36.7	1.0
Peas/beans[3]	244	239	-2.0	14.9	5.3
Maize/other fodder	179	198	10.5	22.7	4.4
Vegetables	124	120	-3.2	2.2	2.6
Total tillage[4]	*4571*	*4531*	*-0.9*	*-2.5*	*100.0*
Set-aside[5]	555	557	0.4	-4.5	10.9
Grassland					2004/2005 grass areas as % of total grass area
Less than 5 years old	1109	1057	-4.7	-3.3	17.4
5 years and older	4940	5035	1.9	9.6	82.6
Total grass[6]	*6050*	*6093*	*0.7*	*7.1*	*100.0*
Total crops and grass[7]	*10621*	*10624*	*0.0*	*2.8*	

[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 and bare fallow, but not set-aside.
[5] including industrial crops; the percentage area is expressed as the ratio of set-aside area to the total tillage area including setaside designated for cultivation.
[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.*

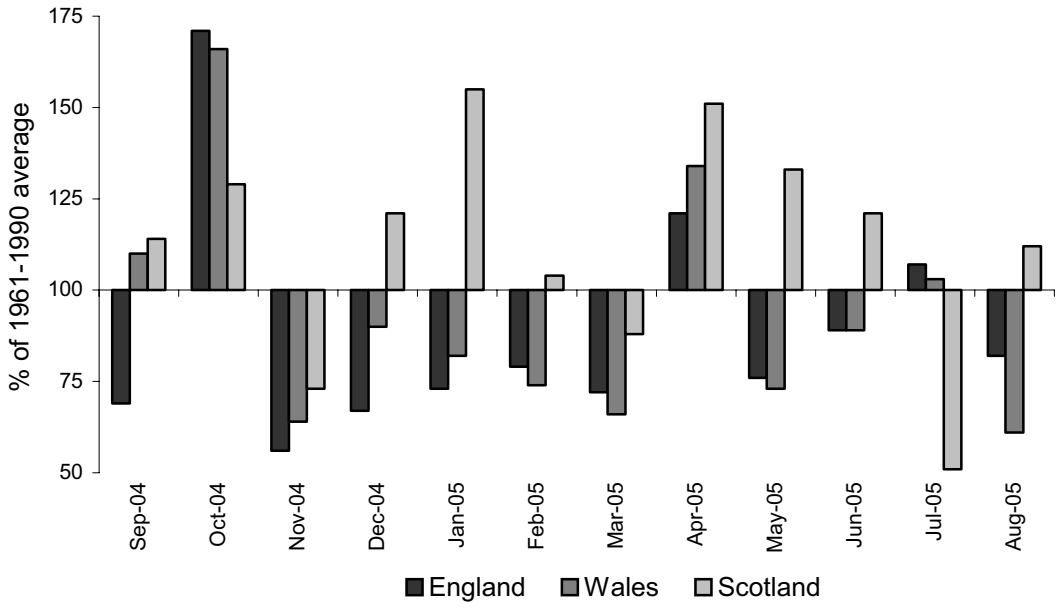
- *Adverse weather conditions can disrupt planned farming activities, such as fertiliser spreading.*

- *Growing conditions determine plant growth and hence affect nutrient requirements.*

Unlike the previous two years when weather conditions were dry, autumn 2004 was wetter than usual, especially in August and, as shown in Figure A3.1, in October. This caused problems for harvest of cereals and potatoes and as a result delayed drilling of autumn sown crops. Except in Scotland, over winter rainfall was lower than average, and the November to March rainfall in England and Wales was the lowest for that period since 1975/76.

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 spring crops often require less fertiliser. The impact of these all these factors on fertiliser use are discussed in Section B of this report.

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



[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 2001 to 2005. 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 2004/2005 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 8.7 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 2005 Agricultural Census on crop areas have been summarised in Table A3.1. Crop area estimates from the Agricultural Census have greater reliability as they are derived from a far larger sample of farms. Census 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, and this has proved to be the case again this year.

[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 2001 – 2005

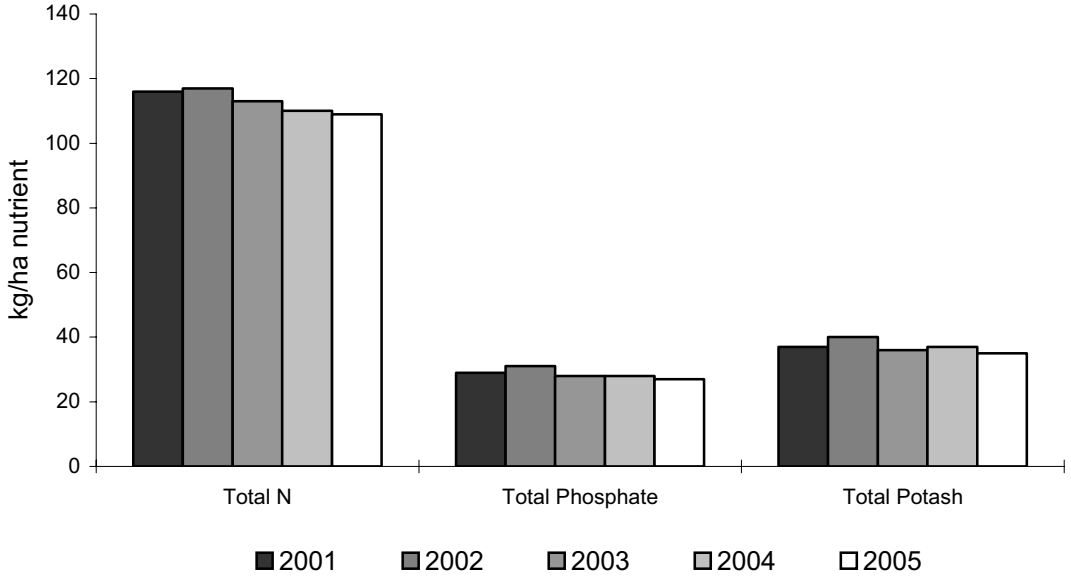


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2001 – 2005

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2001	145	94	116
2002	152	89	117
2003	149	83	113
2004	152	77	110
2005	150	74	109

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2001	118	39	74
2002	128	32	76
2003	129	31	74
2004	132	27	73
2005	129	28	74

Compound nitrogen

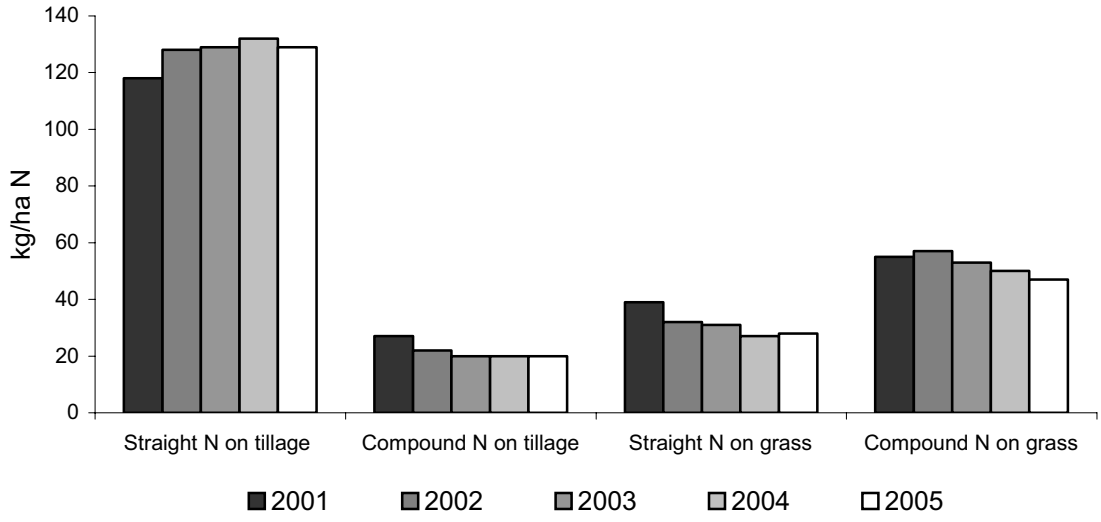
	tillage crops	*grass*	*all crops and grass*
2001	27	55	42
2002	22	57	42
2003	20	53	38
2004	20	50	37
2005	20	47	35

B1.1.1 NITROGEN

All crops and grassland

The total nitrogen use on all crops and grassland declined slightly in 2005 compared with the rates in 2004 (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 straight nitrogen on tillage crops and compound N on grass (Figure B1.2). The relatively high level of compound to tillage in 2001 probably reflects the effects of the wet autumn in 2000 on crop management.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2001 – 2005



Tillage crops

Overall total nitrogen use (150 kg/ha) decreased slightly from the 2004 level which, with 2002, was the highest in the 5 year period. 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. 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 3 kg/ha from the previous year. The total nitrogen rate (74 kg/ha) was the lowest reported for both the last five years (mean: 83 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 2005 was similar at 40 kg/ha to the previous year, and equalled the lowest rate for the period (Table B1.2). Phosphate use on grassland decreased very slightly (-1 kg/ha) compared with the previous year to 16 kg/ha and represents the lowest rate for the period. At 27 kg/ha, phosphate use on all crops and grassland is close to the five year mean of 29 kg/ha. The area of tillage crops receiving phosphate fertiliser was similar to previous years at 63% (five year mean 64%), but for grassland the area receiving phosphate fertiliser was lower than the five year mean of 58% at 55%.

Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2001 – 2005

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2001	43	19	29
2002	44	20	31
2003	40	18	28
2004	41	17	28
2005	40	16	27

Total potash

	tillage crops	*grass*	*all crops and grass*
2001	52	24	37
2002	57	25	40
2003	54	22	36
2004	55	22	37
2005	53	20	35

Potash

Potash use on tillage crops decreased slightly (-2 kg/ha) to 53 kg/ha in 2005. The overall rate of potash on grassland also declined by 2 kg/ha to 20 kg/ha, the lowest level in the period. Over the last five years, potash use on all crops and grassland has fluctuated from year to year. At 35 kg/ha in 2005 it was lower than the five year mean of 37 kg/ha. The area of tillage crops receiving potash fertiliser was similar to previous years at 67% (five year mean: 66%), whilst for grassland the area receiving potash fertiliser decreased slightly to 55% (five year mean: 58%).

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 2005 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 2001 – 2005

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	185	111	145	151	193	103
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

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	171	66	127	37	176	83
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

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	14	45	19	115	17	20
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

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	42	43	45	127	41	36
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

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	45	51	64	184	42	78
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

[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 2001 – 2005

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	189	114	149	175	196	106
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

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	184	95	143	96	186	100
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

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	70	72	62	155	59	93
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

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	66	55	65	163	64	76
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

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2001	72	64	82	231	68	124
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

[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 maincrop/second early potatoes, where there was a slight increase. Except for oilseed rape (where there was no change) the average field rates (Table B1.4) showed a similar trend.

Winter wheat

After increases in 2002 and 2003, the overall rate of total nitrogen on winter wheat remained unchanged at 197 kg/ha in 2004, and then in 2005 it decreased slightly to 195 kg/ha (Table B1.3). The average field rate (Table B1.4) followed a similar pattern and at 197 kg/ha was also slightly lower than the 2003 and 2004 rates, which were the highest 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 2001 – 2005

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2001	209	182	119	100	137	151
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

The difference between the rates applied to milling and non-milliing 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). London: The Stationery Office.

The non-milling crop continues to be the major crop area (Table B1.6) with only 30% of the crop area in 2005 as milling wheat (5 year mean: 30%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2001 – 2005, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2001	31	69	54	46	31	69
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

Spring barley

Overall use of total nitrogen on spring barley declined slightly to 102 kg/ha in 2005 which is the lowest for the five year period (mean: 107 kg/ha). The overall rate of straight nitrogen decreased in 2005 falling to the lowest value for the period (59 kg/ha), whilst the compound nitrogen rate also decreased slightly to 43 kg/ha, equally the previous lowest value for the period in 2002. Average field rates did not show such a marked decline.

Further analysis of the data by crop type (Table B1.5) shows that after a decline in the average rate applied to the spring malting crop from 2001 to 2004, the rate in 2005 remained unchanged at 111 kg/ha. For non-malting crops the nitrogen application rate was at it's highest (101 kg/ha) for the period in 2002. In 2005 it was at its lowest level (95 kg/ha).

Estimated nitrogen rates on malting crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 16 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 2001-2005 is 60%.

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

Winter barley

Overall total nitrogen use on winter barley decreased in 2005 to 142 kg/ha after reaching the highest level (154 kg/ha) for the 2000-2004 period in 2002 (mean: 147 kg/ha). The overall use of straight nitrogen has fluctuated during the period, the rate in 2005 equals the average rate for the five year period (128 kg/ha). The overall compound nitrogen rate has also fluctuated with the lowest level of 14 kg/ha in 2005 and the highest level of 22 kg/ha in 2002 (mean: 19 kg/ha). Average field rates show a similar pattern.

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 (-11 kg/ha) to 134 kg/ha and by 1 kg/ha to 151 kg/ha on non-malting crops in 2004 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 a gradual increase from 2000 to 2003 the survey estimates showed a drop in the relative crop area grown for malting in 2004, down to 33%, this remained unchanged in 2005 (Table B1.6).

Maincrop potatoes

Overall total nitrogen use on maincrop potatoes has fluctuated over the last five years. In 2005 it increased by 12 kg/ha to 166 kg/ha, well above the five year mean of 156 kg/ha (Table B1.3). This increase in 2005 appears to be mainly due to an increase in the average field rate (Table B1.4), as the area receiving nitrogen fertiliser remains unchanged from the previous year. Overall, most of the nitrogen input for maincrop potatoes is applied in compound form.

Oilseed rape

Overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, decreased very slightly (-1 kg/ha) compared with 2004, which was the highest level for the 2001-2005 period (202 kg/ha) after reaching the lowest level (191 kg/ha) in 2003 (mean: 197 kg/ha). The average field rate showed a similar fluctuation. Straight nitrogen is 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 been relatively stable during the 2001-2005 period (range: 206-211 kg/ha) compared with the spring crop (range: 136-153 kg/ha). The highest levels occurred in 2004 and 2005 respectively. The five-year mean nitrogen rates were 208 kg/ha for winter oilseed rape, compared to 144 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 2001 – 2005

Total nitrogen (kg/ha)

	winter oilseed rape	*spring oilseed rape*
2001	209	151
2002	207	137
2003	206	141
2004	211	136
2005	206	153

Percentage distribution (%)

	winter oilseed rape	*spring oilseed rape*
2001	81	19
2002	91	9
2003	81	19
2004	89	11
2005	93	7

Most of the oilseed rape area is autumn, rather than spring sown (Table B1.7). The lowest areas of winter crops (81%) occurred in 2001 and 2003. The high level of spring cropping in 2001 was almost certainly due to the very wet conditions in autumn 2000. In contrast, the autumns of 2002 and 2003 were very dry during August and September, so winter sown crops did not establish well and were often re-drilled with a spring crop. The highest level of winter cropping occurred in 2005.

Sugar beet

The overall nitrogen use on sugar beet decreased very slightly (-1 kg/ha) in 2005 to 94 kg/ha, which is less than the mean for the five year period 2001-2005 of 100 kg/ha. Average field rates showed a similar pattern of slight fluctuations 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 small change in overall phosphate use on tillage crops in 2004 can be partly attributed to limited change in use on most of the major arable crops (Table B1.3). A slight decrease for cereals crops is offset by a large increase in the rate for potatoes. Average field rates showed a similar pattern. The area receiving phosphate fertiliser has fluctuated throughout the five year period.

Overall phosphate rates for cereals in 2005 were: winter wheat 37 kg/ha, spring barley 40 kg/ha, and winter barley 42 kg/ha (Table B1.3). The rate for winter wheat was the lowest recorded value in the period 2001 to 2005. The average field rate for each cereal crop were 61, 51 and 61 kg/ha for winter wheat, spring barley and winter barley respectively. The average field rates for winter wheat and spring barley were the lowest for the five year period. The area receiving phosphate fertiliser remained lower for winter wheat (61%) and winter barley (69%) than for spring barley (78%), this is mainly due to the greater use of NPK compounds on the latter.

The overall rate of phosphate on maincrop/second early potatoes was increased by 26 kg/ha to 151 kg/ha in 2005. This is the highest value for the five year period (mean: 131 kg/ha). The average field rate shows similar annual variation (mean: 153 kg/ha). The area of maincrop potatoes receiving phosphate increased to 91% in 2005, the highest for the period (range: 78-87%).

For oilseed rape, the overall application rate of phosphate showed little change in 2005 (40 kg/ha) compared with the previous two years. The highest rate (50 kg/ha) occurred in 2002 and the mean for the period 2001-2005 was 42 kg/ha. The average field rate shows similar fluctuations. Except for 2002 when it rose to 70%, the area receiving phosphate fertiliser has been fairly static at around 63 - 64%.

The recorded overall rate of phosphate on sugar beet increased very slightly in 2005 to 37 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 51% (mean: 51%).

Potash

Overall potash use on tillage crops showed little change in 2005, partly because the small reductions in application rates on cereal crops, which represent a large area of the major tillage crops, were offset by large increases in the rates on potatoes and sugar beet. Average field rates showed a similar pattern. Except for maincrop potatoes the area receiving potash fertiliser reduced in 2005 compared with the previous years.

The overall potash use on cereals was slightly down at 44, 52 and 57 kg/ha for winter wheat, spring barley and winter barley respectively (Table B1.3). The corresponding average field rates were also down at 72, 63 and 78 kg/ha (Table B1.4). The area receiving potash fertiliser has remained fairly static throughout the period 2001-2005.

The overall potash rate on maincrop potatoes increased in 2005 by 55 kg/ha to 256 kg/ha. There has been a great deal of fluctuation in overall rate during the period 2001-2005 (range: 184-256 kg/ha, mean: 215 kg/ha). In comparison, the average field rate has been less variable (range: 231-271 kg/ha, mean: 241 kg/ha). Thus the fluctuations in overall rate appear to be due to changes in the area receiving potash fertiliser (for example only 79% in 2001 compared with 94% in 2005).

In 2005 potash use on oilseed rape decreased to 42 kg/ha for the overall rate and to 68 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 has remained fairly static throughout the period (range: 62-65%)

Overall rates of potash for sugar beet have fluctuated throughout the period 2001-2005 (Table 1.3), with the highest value (112 kg/ha) in 2005 and the lowest value (78 kg/ha) in 2001. The mean for the five year period is 98 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 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 42 kg/ha for winter wheat, winter barley and spring barley respectively. The rate for oilseed rape decreased slightly (-3 kg/ha) in 2005 following the highest ever recorded rate (85 kg/ha) in 2004 (Table B1.8). 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 and 50-75 kg/ha for oilseed rape[14].

[13] McGrath S P, Zhao F J and Blake-Kalff M M A (2002). History and outlook for sulphur fertilisers in Europe. *Proceedings No. 497*. The International Fertiliser Society, York. ISBN 0 85310 133 7.

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

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2001 – 2005

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2001	18	19	15	26
2002	28	27	25	47
2003	30	35	27	54
2004	38	37	27	57
2005	41	34	32	59

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2001	51	48	36	61
2002	48	54	40	78
2003	53	53	48	74
2004	53	48	46	85
2005	55	52	41	82

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, 2001 – 2005

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2001*	17	14	11	23
	2002	27	22	20	43
	2003	29	34	27	55
	2004	37	35	25	57
	2005	41	33	31	59
Scotland*	*2001*	34	35	19	56
	2002	51	54	28	72
	2003	42	39	28	49
	2004	59	57	29	60
	2005	41	37	33	61

* 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 2001 – 2005

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2001	39	55	94	19	24
2002	32	57	89	20	25
2003	31	53	83	18	22
2004	27	51	77	17	22
2005	28	47	74	16	20

The 3 kg/ha drop in overall total nitrogen use on grassland in 2005 was associated with a decrease in the dressing cover (Table B1.11), which at 68 kg/ha is the lowest for the period.

Although the dressing cover for straight nitrogen showed a slight increase in 2005 compared with 2004, the underlying trend for both dressing cover and average field rate is downwards. The area receiving compound nitrogen has fluctuated during the period, reaching its lowest level (54%) in 2005, (period mean: 57%). The average field rate for compound nitrogen has also fluctuated, with the lowest rate for the period (87 kg/ha) also occurring in 2005 (period mean: 92 kg/ha)

Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2001 – 2005

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2001	31	57	72	58	58
2002	28	59	73	60	59
2003	27	56	70	57	57
2004	25	58	70	59	59
2005	26	54	68	55	55

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2001	128	96	133	32	42
2002	113	97	122	33	42
2003	114	94	119	31	39
2004	107	88	109	29	38
2005	107	87	109	29	37

Average field rates for phosphate and potash were at their lowest level for the five year period in 2005, falling to 29 kg/ha for phosphate and 37 kg/ha for potash, compared with a mean for the period of 31 kg/ha and 40 kg/ha respectively. The dressing cover which has varied throughout the last five years, was also at its lowest in 2005 at 55% for both phosphate and potash (five year mean: 58% phosphate and 58% 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 2005 are presented in Section C tables. The Survey estimates for annual distributions of the total grassland area between grazing and cutting management regimes since 2001 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 2001 – 2005

	grazed [a]	*silage* [b]	*hay* [b]
2001	91	38	10
2002	92	31	10
2003	93	29	10
2004	94	29	11
2005	93	28	13

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion has increased since 2001. It is not possible to say how much this may have been influenced by Foot and Mouth.

[a] May also be cut.

[b] May also be grazed.

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2001 – 2005

Total nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2001	91	142	63	*2001*	130	165	85
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

Straight nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2001	40	52	23	*2001*	130	131	81
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

Compound nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2001	51	90	40	*2001*	95	127	75
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

During the period 2001-2005, overall total nitrogen rates have shown a net decrease for grazed grass, whilst rates for the silage and hay categories have fluctuated. The changes in overall application rate of total nitrogen appear to be mainly due to the changes in the average field rate. In 2001 the dressing cover was reduced significantly for all types of grassland probably due to Foot and Mouth. In 2005 68% of grazed grass, 89% of silage and 63% of hay received nitrogen.

The overall use of straight nitrogen on grazed grass and silage has declined over the last five years, partly as a result of reductions in the dressing cover, but in 2002 also due to the large reduction in average field rate. The rates for hay are more variable. Compound nitrogen inputs have fluctuated during the last five years with low rates in 2005 compared with the five year means for all categories of management. The five year means for overall nitrogen rate being 50, 86 and 37 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. Also, in 2001 Foot and Mouth led to a major reduction in livestock numbers with nearly 6 million animals destroyed either to combat disease or for welfare reasons which further reduced herbage production requirements. Although there was a partial recovery in 2002 the area receiving N fertiliser remains lower than before.

[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 2001 – 2005

Total phosphate

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2001	18	27	15	*2001*	31	38	28
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

Total potash

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2001	23	45	18	*2001*	40	59	35
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

Overall phosphate rates fluctuated throughout the period 2001-2005 (Table B1.14), with a downward trend in all categories post 2002. In 2005 the rates of 16, 25 and 14 kg/ha for grazed grass, silage and hay respectively were the lowest or equal lowest for the period. The corresponding five year means were 17, 27 and 16 kg/ha. Average field rates showed a similar pattern. Grass cut for silage is more likely to receive phosphate (71% in 2005) than grazed grass (57%) or hay (50%).

Like phosphate, there have been fluctuations in overall potash rates between years, but the underlying trend is downwards with a net decrease in inputs to all types of grass. Overall rates in 2005 were the lowest for the period. Five year means were 21, 43 and 19 kg/ha for grazed grass, silage and hay respectively. The biggest decline has occurred with grazed grass and silage. Average field rates show a similar trend. Grass cut for silage is more likely to receive potash (78% in 2005) than grazed grass (54%) or hay (50%).

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 were low in 2001 (possibly due to Foot and Mouth), but have increased since, most notably on silage in 2002. The total area of grass treated in 2005 (6%) was the same as in the previous year and represents a 4% 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 factor.

Table B1.15 Sulphur use on grassland, Great Britain 2001 – 2005

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2001	2	5	2	2
2002	5	12	4	6
2003	4	10	6	5
2004	5	10	5	6
2005	5	11	6	6

Average application rate (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2001	34	33	30	31
2002	42	48	57	44
2003	37	44	44	40
2004	36	37	29	38
2005	34	39	47	37

Estimated average field rates of sulphur application for each sward management category did not show any consistent changes during 2001-2005, with five year means of 37, 40 and 41 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. *Proceedings No. 497*. The International Fertiliser Society, 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 – 2005

	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

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 is 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)).

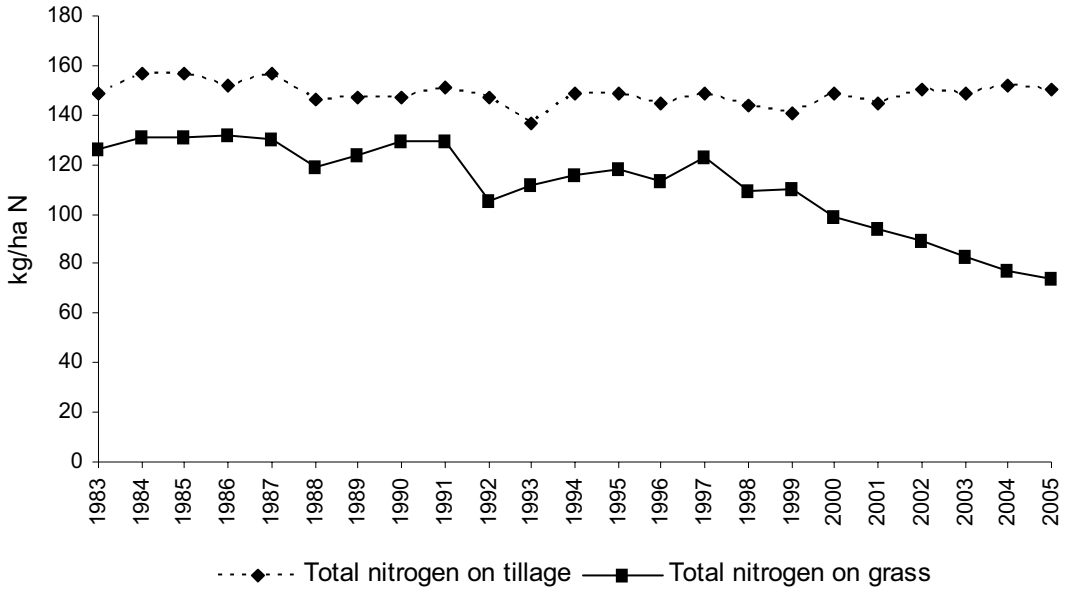
Most of total nitrogen fertiliser used on tillage crops each year has, since 1983, been applied in straight form.

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 2004. The overall nitrogen rate of 74 kg/ha on grassland in 2005 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)).

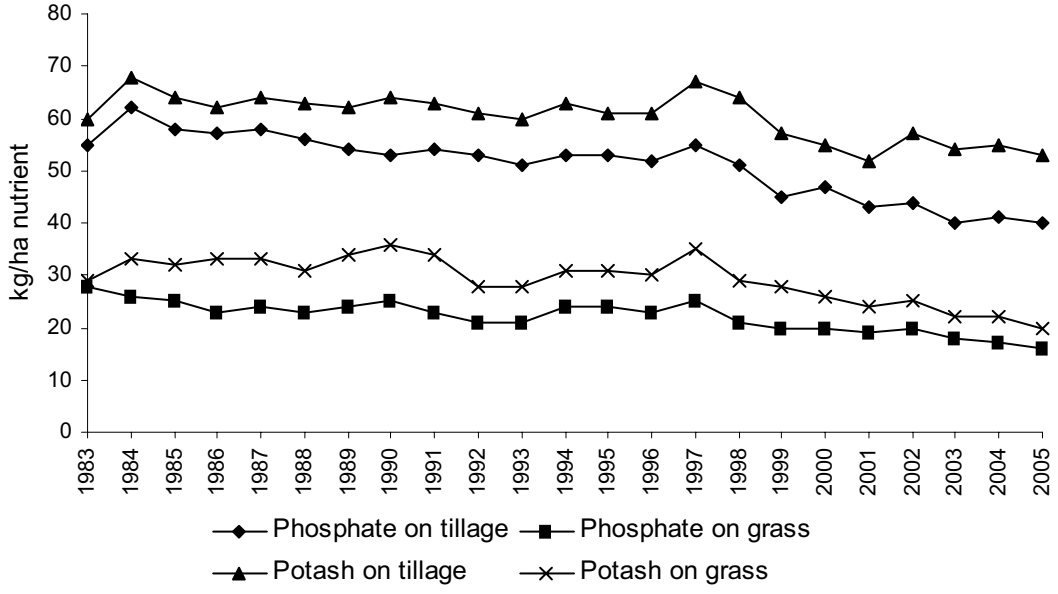
Overall nitrogen use on all crops and grassland, as a single category averaged at 142 kg/ha (peak 144 kg/ha) in the first five years (1983-1987) of the Great Britain data set. The means for each of the subsequent five year periods are 1988-92: 134 kg/ha, 1993-1997: 130 kg/ha, 1998-2002: 121 kg/ha and 2003-to date: 110 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 – 2005**

(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 – 2005

	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

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 2005 rate of 40 kg/ha equals the 2003 rate which was the lowest 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 2005, 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 2003-05.

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 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. It has recovered slightly since then. The 2001 value is the lowest level recorded since 1983 and represents a

23% fall from the peak value of 68 kg/ha in 1984. Like phosphate use on tillage, the 2001 level was associated principally with a higher proportion of spring barley, which has a lower fertiliser requirement.

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 2003. 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 has been consistently lower (mean: 26 kg/ha) than in earlier years and the value of 20 kg/ha in 2005 represents the lowest value recorded 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

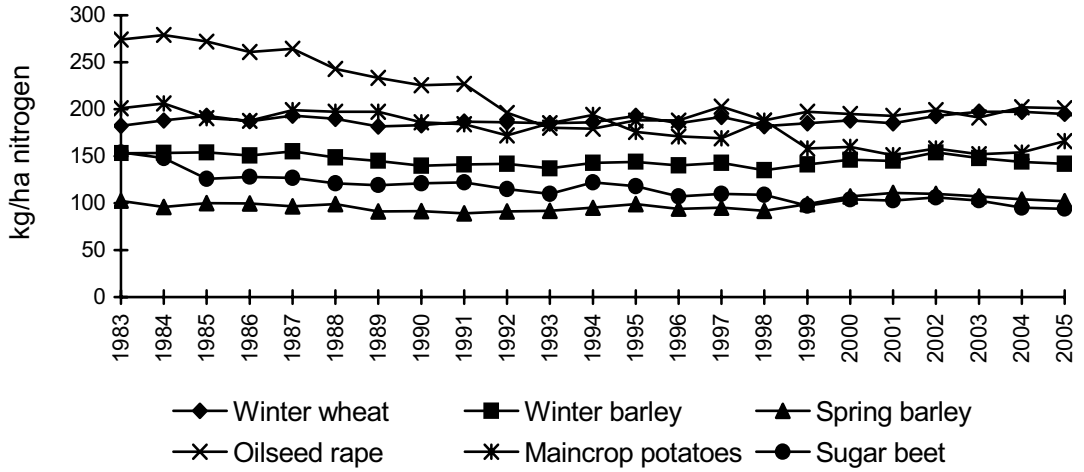
Between 1983-87 the five year mean for winter wheat was 189 kg/ha. Over the following five years it declined to 185 kg/ha, increasing to 188 kg/ha for the period 1993 to 1997 and dropping slightly to 187 kg/ha in 1998-2002. The rates of 197 kg/ha in 2003 and 2004 (Figure B2.2(a)) are the highest recorded 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 202 kg/ha in 2004 is the highest since 1997.

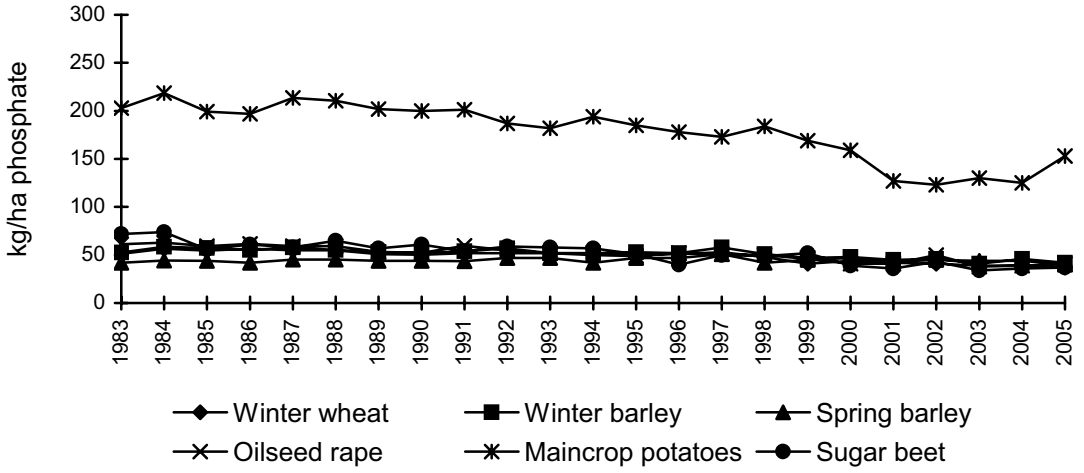
Since the early 1980s, overall nitrogen use on maincrop potatoes has tended to decrease, despite some large variability in estimated annual rates; mean usage was 197, 187, 179 and 163 kg/ha for the periods 1983-1987, 1988-1992, 1993-1997 and 1998-2002 respectively. Sugar beet has also experienced a decline (137, 120 113 and 104 kg/ha) over the same periods. Mean rates of 157 kg/ha for maincrop potatoes and 97 kg/ha for sugar beet for 2003-2005 continue the decline. The trend towards less nitrogen use on sugar beet reflects greater 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 – 2005**

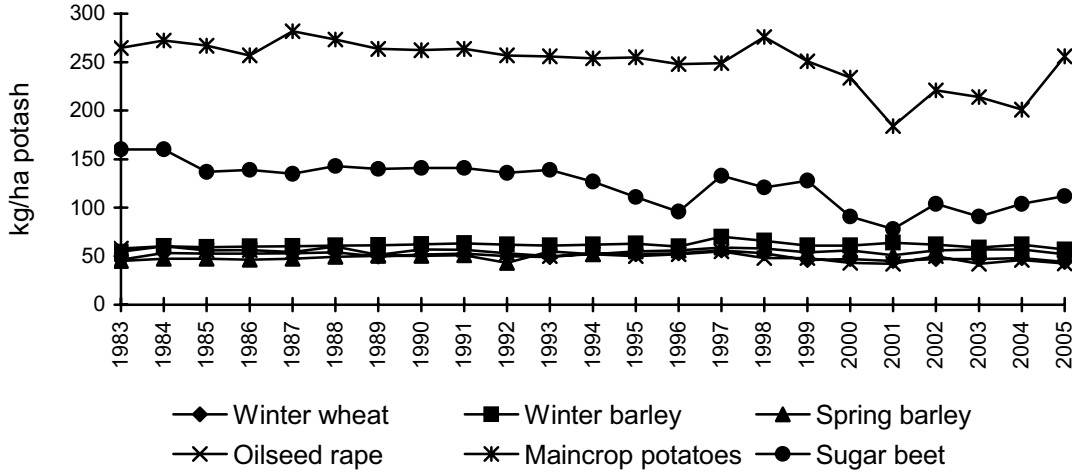
(a)



(b)



(c)



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 38 and 43 kg/ha for winter wheat and winter barley respectively for the 2003-2005 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 2003-2005.

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 2003-2005 suggest the downward trend may be continuing (mean: 43, 224, 102 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 the dressing cover is now less than 5% in England & Wales (Table B2.3). There was a large reduction in 2003 in Scotland which meant it reduced to less than 50% on both crops for the first time, but it increased again in 2004. 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 crops 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 – 2005 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

Winter oilseed rape – dressing cover and application rate

	England & Wales		*Scotland*		*Great Britain*	
	dressing cover	*application rate*	*dressing cover*[a]	*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

[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.

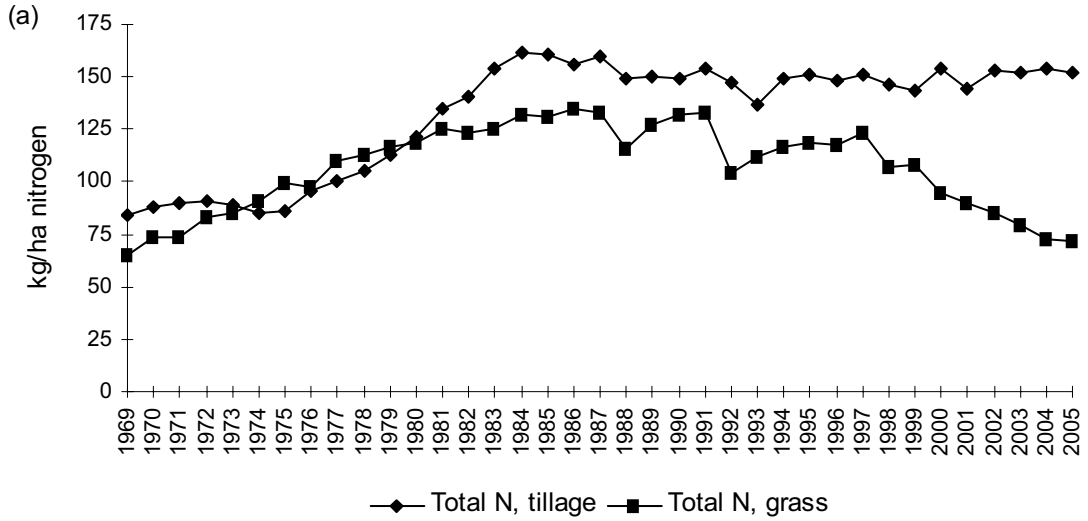
B2.2.1 NITROGEN USE

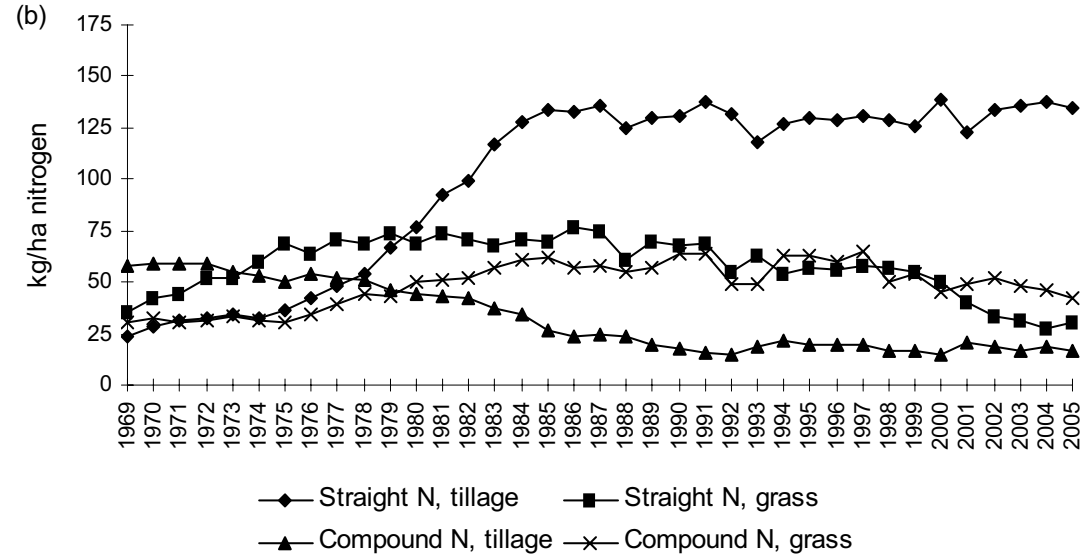
The falls in nitrogen use on tillage crops (Figure B2.3(a)) in the 1988, 1999 and 2001 seasons can be largely attributed to the reduced cropping areas of winter cereal and winter oilseed rape due, except for oilseed rape in 1999, to very wet autumns which restricted drilling opportunities. For example, 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.

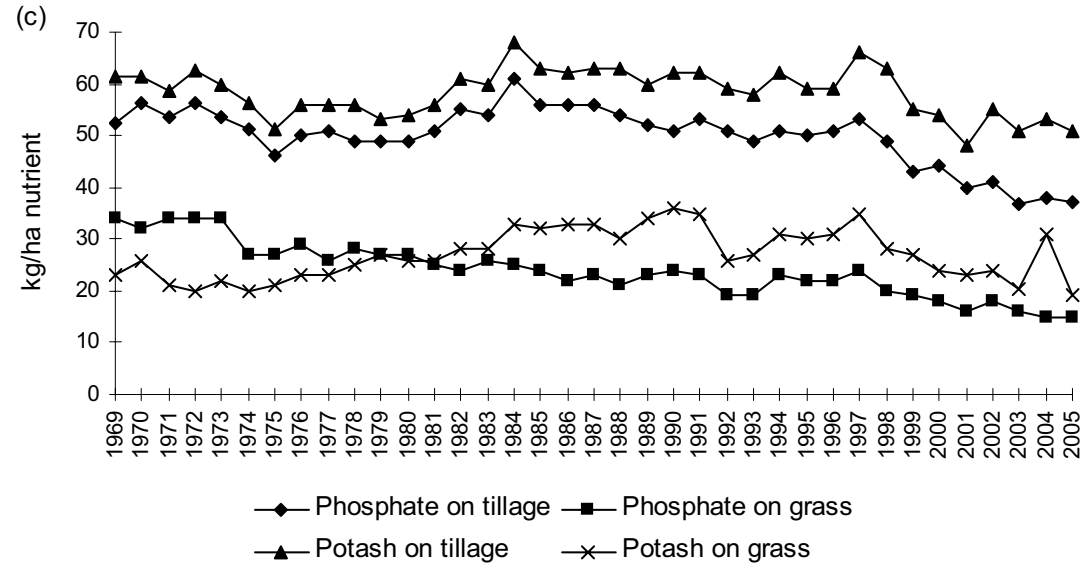
The sharp drop in nitrogen use on grassland in both 1988 and 1992 may have partly reflected the influence of seasonal weather patterns on grass growth and related nitrogen requirements. The increased use of fertiliser nitrogen on grassland during the 1980s had been accentuated by its high cost/benefit ratio, 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 2005 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 3% 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.

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 – 2005**







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 2005 application rates were at, or close to, 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 1992, then recovered slightly before dropping back to 19 kg/ha in 1999. Levels continued to decline into the 2000s, and at 15 kg/ha, reached their lowest recorded level in 2004 and 2005. 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 six years at 22 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.

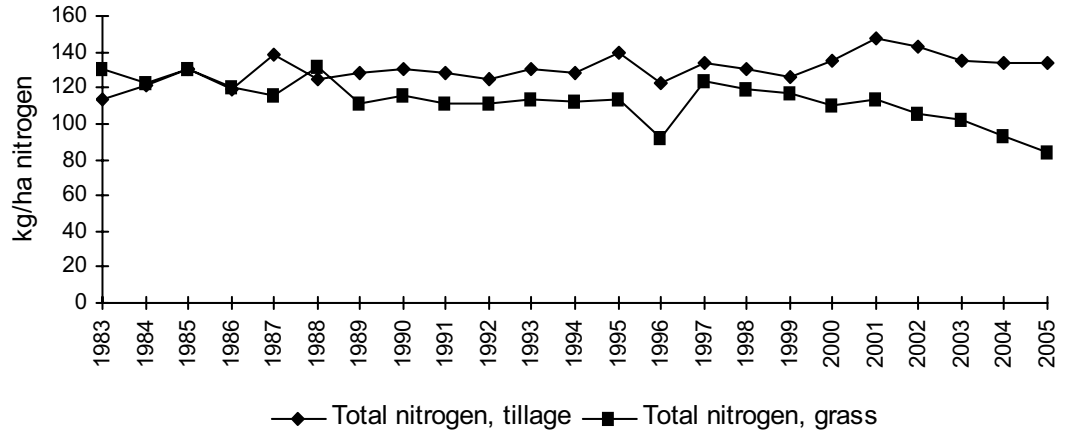
B2.3.1 NITROGEN USE

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)).

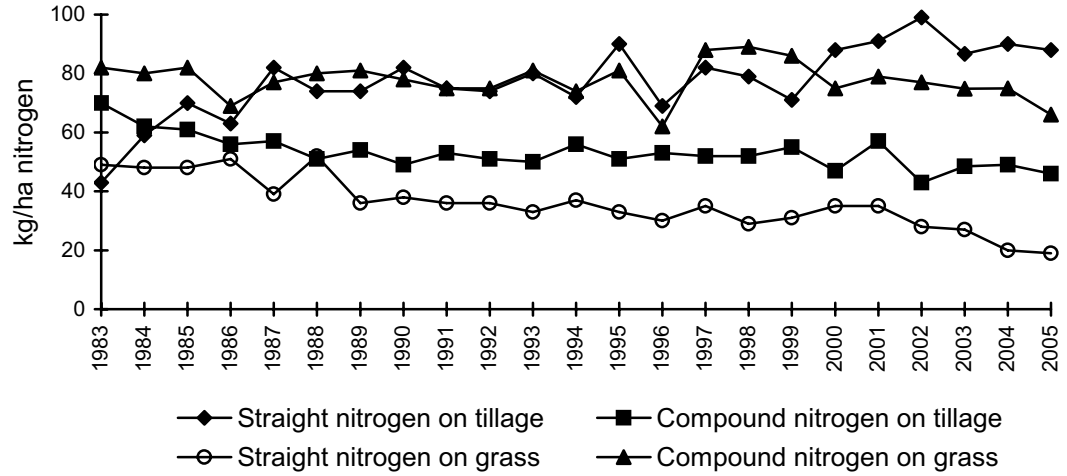
Before 1985, more nitrogen was applied to tillage crops in compound than in straight form (Figure B2.4(b)). Subsequently, about 60-65% of the total nitrogen input for tillage crops has been applied in straight form. In 2002 this increased temporarily to 70%; the corresponding proportion in England & 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 has decreased since the late 1980s, and at 19 kg/ha is at its lowest value in 2005, this represents about one quarter of the total nitrogen input on grassland in recent years.

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 – 2005**

(a)



(b)



(c)

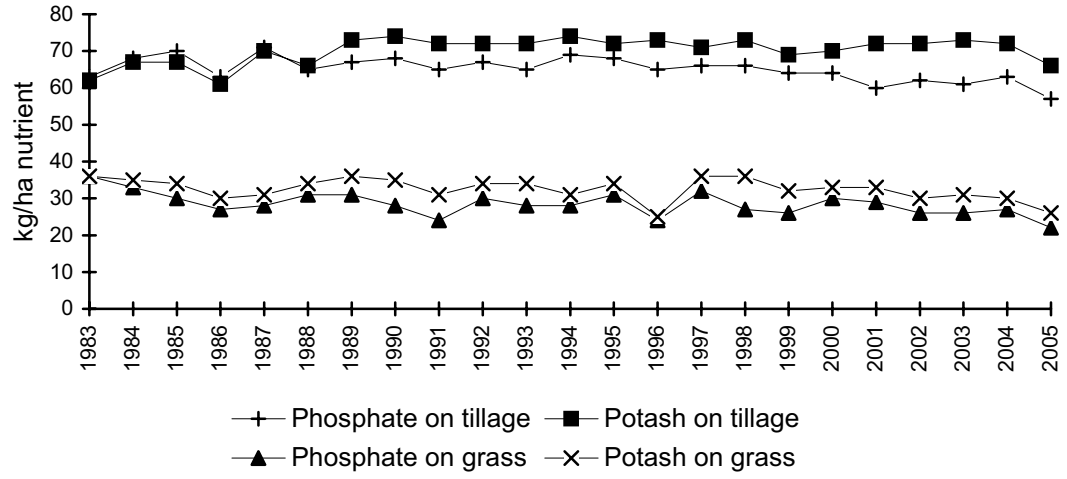
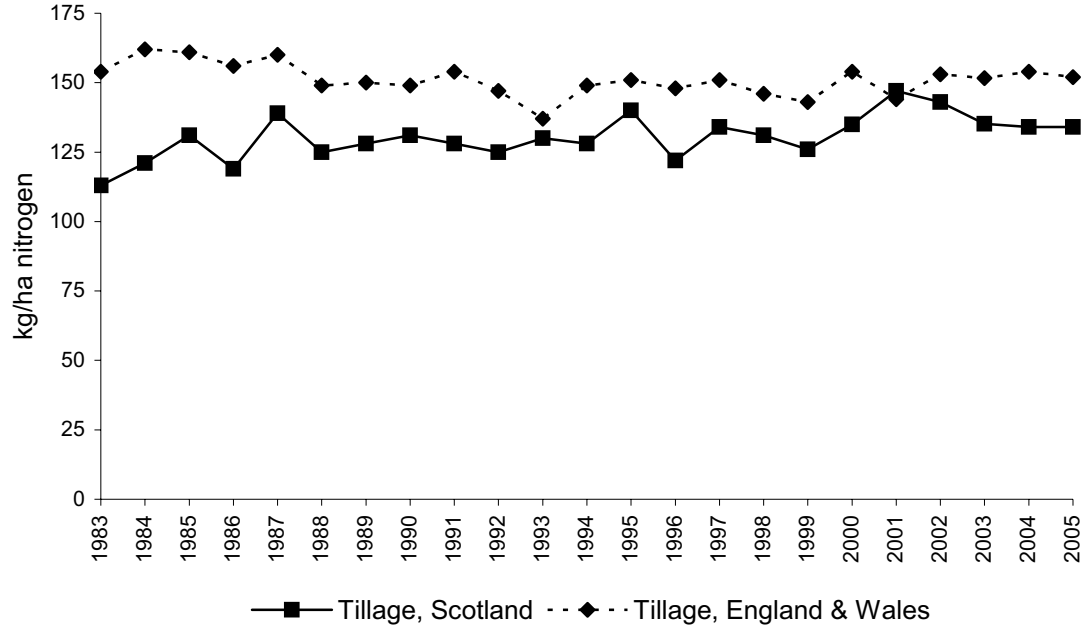
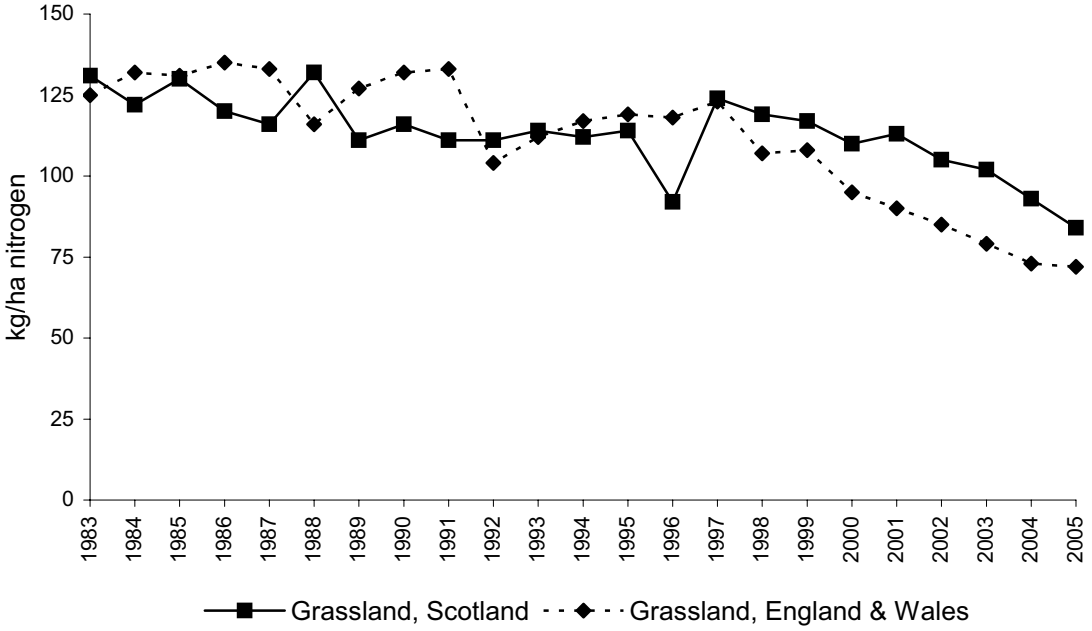


Figure B2.5 **Overall application rates (kg/ha) of (a) total nitrogen to tillage crops, and (b) total nitrogen to grassland in Scotland and in England & Wales 1983-2005**

(a)



(b)



B2.3.2 PHOSPHATE AND POTASH USE

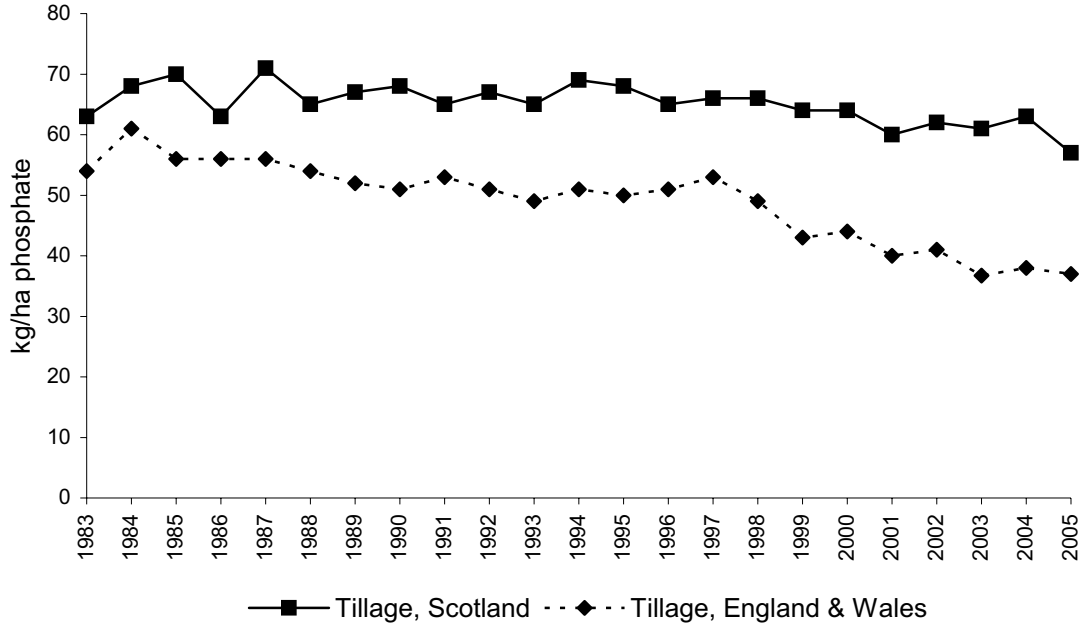
Overall rates of phosphate and potash on tillage crops tended to fluctuate between 1983 and 1988, but have been relatively stable since 1989 (Figure B2.4(c)) with an average of 65 kg/ha for phosphate and 72 kg/ha for potash.

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 33 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, since then rates in England & Wales have declined more rapidly than 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 1983-2005**

(a)



(b)

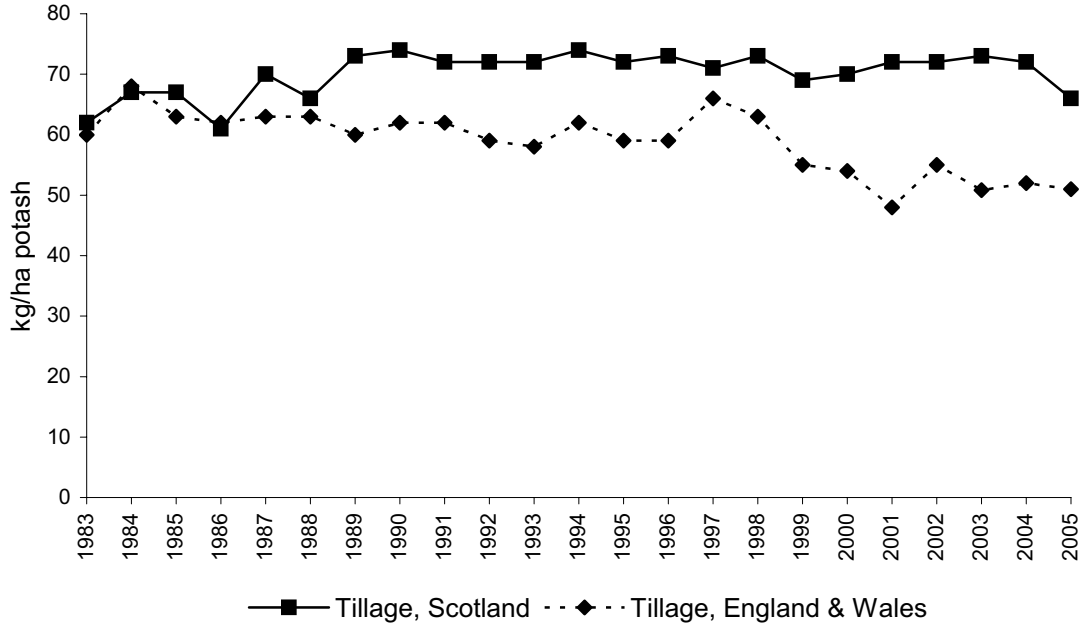
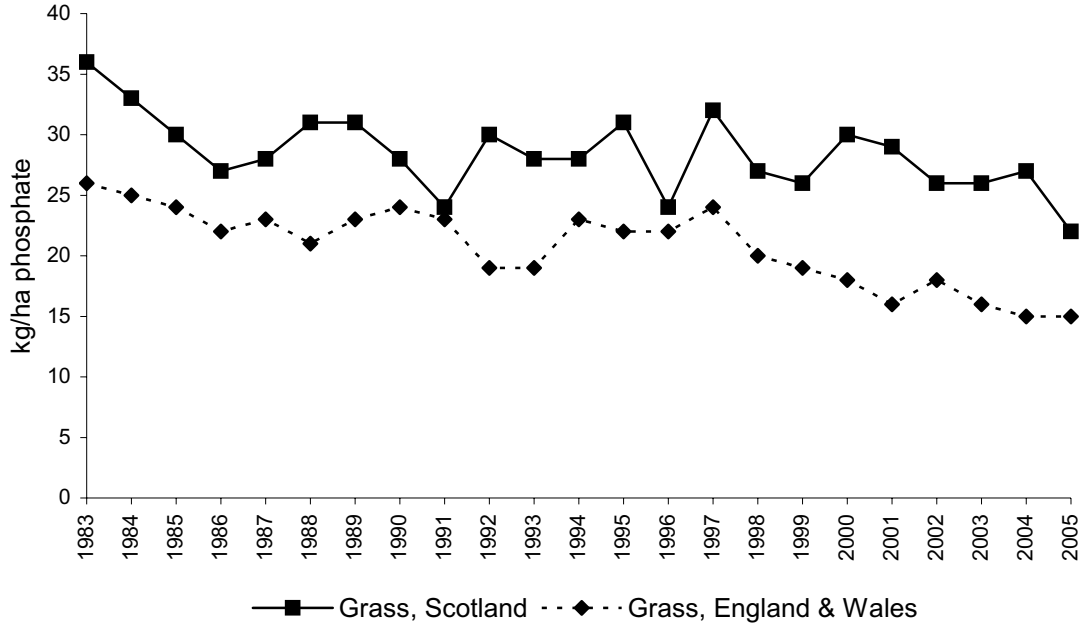


Figure B2.7 **Overall application rates (kg/ha) of (a) phosphate and (b) potash to grassland in Scotland and in England & Wales 1983-2005**

(a)



(b)

SECTION C - TABLES

CONTENTS

GREAT BRITAIN TABLES 2005

ENGLAND AND WALES TABLES 2005

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.

SCOTLAND TABLES 2005

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 2005

	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	73	42	46	22	142	48	68	104	20	31	62
Winter wheat	99	61	61	13	197	61	72	195	37	44	2040
Spring barley	97	79	82	33	105	51	63	102	40	52	732
Winter barley	98	69	73	21	144	61	78	142	42	57	571
Oats	92	69	78	17	106	60	67	97	41	52	156
Rye/Triticale/Durum wheat	72	44	52	44	107	51	67	77	22	35	51
Seed potatoes	84	84	84	63	155	196	202	130	165	170	9
Early potatoes	65	65	65	92	173	110	220	112	71	142	8
2nd Early/Maincrop potatoes	97	91	95	44	171	168	271	166	153	256	153
Sugar beet	93	51	76	35	101	73	147	94	37	112	218
Spring oilseed rape	98	43	56	9	153	56	62	150	24	35	42
Winter oilseed rape	99	66	63	11	206	63	68	205	42	43	546
Linseed	94	40	34	7	75	42	57	70	17	20	49
Forage maize	80	66	52	94	64	57	109	51	37	56	163
Rootcrops for stockfeed	92	62	92	82	87	102	89	81	63	82	70
Leafy forage crops	62	56	56	49	75	36	47	47	20	26	30
Arable silage/Other fodder crops	44	42	32	26	66	57	53	29	24	17	28
Peas - human consumption	4	36	44	2	59	55	66	2	20	29	91
Peas - animal consumption	9	39	43	14	29	55	76	3	22	33	64
Beans - animal consumption	6	35	34	16	33	49	62	2	17	21	132
Vegetables (brassicae)	99	99	97	19	179	76	153	178	75	148	48
Vegetable (other)	32	53	55	5	114	87	118	36	46	65	130
Soft fruit	90	88	90	0	36	30	55	33	26	50	16
Top fruit	84	41	64	0	148	29	105	124	12	67	107
Other tillage	59	51	59	13	82	58	91	49	29	54	82
All tillage	91	63	65	20	165	63	82	150	40	53	5598
Grass under 5 years old	83	65	68	41	140	34	49	116	22	33	1002
Grass 5 years and over	65	53	52	38	100	28	33	65	15	17	2466
All grass	68	55	55	38	109	29	37	74	16	20	3468
All crops and grass	79	59	60	30	139	46	59	109	27	35	9066

Source: British Survey of Fertiliser Practice 2005

Table GB1.2 Use of straight fertiliser, Great Britain 2005

	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	70	3	7	130	61	89	91	2	6	62
Winter wheat	96	6	7	190	73	91	183	5	7	2040
Spring barley	65	2	5	89	50	102	58	1	5	732
Winter barley	93	1	7	137	73	93	128	1	6	571
Oats	73	3	9	108	65	90	78	2	8	156
Rye/Triticale/Durum wheat	56	6	5	107	49	30	60	3	1	51
Seed potatoes	8	0	8	213	0	150	17	0	12	9
Early potatoes	11	11	11	244	151	301	27	17	33	8
2nd Early/Maincrop potatoes	42	4	18	104	60	140	43	2	25	153
Sugar beet	85	3	28	100	85	164	85	2	46	218
Spring oilseed rape	97	3	17	148	55	69	143	2	11	42
Winter oilseed rape	96	5	6	194	70	72	187	4	4	546
Linseed	93	13	7	73	33	79	68	4	5	49
Forage maize	38	2	26	72	57	137	28	1	35	163
Rootcrops for stockfeed	12	0	29	94	0	2	11	0	1	70
Leafy forage crops	18	0	3	71	0	75	13	0	2	30
Arable silage/Other fodder crops	18	10	0	83	83	0	15	9	0	28
Peas - human consumption	4	3	12	59	107	89	2	3	11	91
Peas - animal consumption	6	1	5	33	115	84	2	1	4	64
Beans - animal consumption	3	5	4	42	68	89	1	3	4	132
Vegetables (brassicae)	58	2	0	80	151	0	46	3	0	48
Vegetable (other)	28	5	7	106	73	107	30	3	8	130
Soft fruit	1	0	30	26	0	74	0	0	22	16
Top fruit	72	21	47	153	27	102	110	6	48	107
Other tillage	52	0	10	76	0	129	40	0	13	82
All tillage	80	5	8	162	69	102	129	3	9	5598
Grass under 5 years old	36	1	2	136	73	89	49	1	2	1002
Grass 5 years and over	23	0	0	97	74	95	23	0	0	2466
All grass	26	0	1	107	74	92	28	0	1	3468
All crops and grass	56	6	6	147	70	102	74	2	4	9066

Source: British Survey of Fertiliser Practice 2005

Table GB1.3 Use of compound fertiliser, Great Britain 2005

	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	30	39	41	43	47	61	13	18	25	62
Winter wheat	17	55	54	73	60	68	13	33	37	2040
Spring barley	66	77	78	66	51	60	43	39	47	732
Winter barley	24	68	67	60	61	75	14	41	50	571
Oats	34	68	71	55	58	62	19	39	44	156
Rye/Triticale/Durum wheat	20	38	47	86	51	70	17	19	33	51
Seed potatoes	84	84	76	134	196	208	113	165	158	9
Early potatoes	54	54	54	158	101	203	85	54	109	8
2nd Early/Maincrop potatoes	80	89	87	153	169	265	122	151	231	153
Sugar beet	12	48	49	79	72	135	9	35	66	218
Spring oilseed rape	12	40	39	55	56	60	7	22	24	42
Winter oilseed rape	32	62	57	56	62	67	18	38	38	546
Linseed	5	28	28	37	46	52	2	13	14	49
Forage maize	67	64	29	35	56	74	24	36	21	163
Rootcrops for stockfeed	82	62	92	84	102	89	69	63	81	70
Leafy forage crops	51	56	56	66	36	43	34	20	24	30
Arable silage/Other fodder crops	26	32	32	54	49	53	14	16	17	28
Peas - human consumption	0	33	33	0	51	56	0	17	19	91
Peas - animal consumption	3	38	38	20	53	75	1	20	29	64
Beans - animal consumption	3	30	30	24	46	58	1	14	17	132
Vegetables (brassicae)	92	97	97	142	75	153	131	72	148	48
Vegetable (other)	10	48	47	65	89	119	7	43	57	130
Soft fruit	88	88	88	37	30	31	32	26	27	16
Top fruit	32	21	40	42	30	47	14	6	19	107
Other tillage	20	51	51	46	58	79	9	29	40	82
All tillage	29	59	58	70	62	77	20	37	44	5598
Grass under 5 years old	65	65	67	103	34	48	67	22	32	1002
Grass 5 years and over	51	52	52	83	27	32	42	14	17	2466
All grass	54	55	54	87	29	36	47	16	19	3468
All crops and grass	42	57	56	82	45	55	35	25	31	9066

Source: British Survey of Fertiliser Practice 2005

Table GB1.4 Use of lime, Great Britain 2005

	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	62
Winter wheat	2.7	0.7	0.8	0.2	0.3	4.6	3.7	4.3	4.2	10.8	53.3	7.9	100	2040
Spring barley	6.8	0.1	3.5	0.1	1.5	11.7	4.2	9.9	4.2	4.9	3.2	4.2	89	732
Winter barley	3.0	0.4	0.8	0.1	0.9	5.3	4.0	4.1	4.5	4.9	18.8	6.7	42	571
Oats	4.3	-	1.6	-	-	5.9	4.0	-	3.7	-	-	4.0	10	156
Rye/Triticale/Durum wheat	1.4	-	0.3	-	1.2	2.8	3.1	-	3.7	-	1.5	2.5	5	51
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	9
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	2	153
Sugar beet	5.7	1.8	-	8.8	1.8	17.8	4.6	4.9	-	9.1	7.8	7.2	40	218
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	42
Winter oilseed rape	4.6	1.6	1.2	0.3	0.9	8.5	4.7	4.8	3.3	3.7	17.8	5.9	42	546
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	49
Forage maize	12.5	-	1.1	-	6.1	19.7	4.3	-	3.9	-	3.5	4.1	28	163
Rootcrops for stockfeed	1.9	-	3.0	-	1.1	6.1	4.9	-	4.6	-	2.5	4.3	6	70
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	3	30
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	3	28
Peas - human consumption	2.1	3.3	-	-	1.2	6.6	2.2	5.0	-	-	1.1	3.4	5	91
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	64
Beans - animal consumption	0.2	5.4	-	-	-	5.6	4.9	5.4	-	-	-	5.4	5	132
Vegetables (brassicae)	7.1	11.1	-	35.0	0.2	53.4	2.4	5.0	-	11.1	0.6	8.7	10	48
Vegetable (other)	1.2	2.1	0.6	-	5.9	9.8	3.4	3.7	4.9	-	0.8	2.0	18	130
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	16
Top fruit	-	0.2	-	-	5.5	5.7	-	3.8	-	-	0.4	0.5	11	107
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	4	82
All tillage	3.6	0.9	1.1	0.7	1.0	7.3	4.1	4.8	4.2	9.7	13.4	6.0	431	5598
Grass under 5 years old	1.7	-	0.6	-	2.2	4.5	4.7	-	4.3	-	10.8	7.7	52	1002
Grass 5 years and over	1.3	0.1	0.8	0.1	1.1	3.4	6.9	1.1	5.1	4.9	2.2	4.7	88	2466
All grass	1.4	0.1	0.8	-	1.3	3.6	6.4	1.1	5.0	4.9	4.8	5.4	140	3468
All crops and grass	2.4	0.5	1.0	0.4	1.2	5.3	4.8	4.3	4.5	9.4	8.2	5.8	571	9066

Source: British Survey of Fertiliser Practice 2005

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2005

	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	61	49	47	24	93	26	26	57	13	12	1618
Grazed mown	80	65	68	62	128	32	46	103	21	32	1483
All grazings	68	55	55	38	108	28	35	74	16	19	3101
Cut for silage - grazed	89	73	78	68	142	34	50	126	24	39	1044
Cut for silage - not grazed	88	72	76	56	134	40	59	117	29	45	198
All cur for silage	88	72	78	66	140	35	51	124	25	40	1242
Cut for hay - grazed	62	48	49	51	81	26	31	51	13	15	495
Cut for hay - not grazed	63	53	57	19	96	41	50	61	22	28	112
All cur for hay	63	49	50	47	83	28	34	52	14	17	607
All mowings	80	65	68	60	128	33	48	103	22	33	1772
All grass	68	55	55	38	109	29	37	74	16	20	3468

Source: British Survey of Fertiliser Practice 2005

Table GB3.0 Product and nutrient use by month of application, Great Britain 2005

(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	4	30	39	18	4	3	1	2146
Straight P	27	5	8	3	3	11	18	5	5	1	0	15	37
Straight K	7	4	24	7	2	16	16	13	7	1	0	3	96
Compounds	7	4	2	1	1	5	22	30	13	7	4	4	2115
All Fertilisers	4	2	2	1	1	5	26	33	15	6	3	3	4395

(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	27	39	18	6	3	2	1048
P_2O_5	14	7	3	1	1	7	23	24	9	3	2	5	264
K_2O	11	6	4	2	2	8	22	23	10	5	2	5	345
Total	5	3	1	1	1	5	25	33	15	5	3	3	1658

Note: 'Product 'refers to the total tonnage of the products used by farmers in the survey year 2005;
'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 2005

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2005

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	0.6	0.2	0.1	1.4	3.9	0.9	0.4	0.1	0.4	0.0	0.3	0.7
Urea	2.4	8.1	1.0	1.9	9.3	1.1	6.6	2.2	2.2	1.8	2.8	2.4	5.2
Ammonium Nitrate	29.6	49.3	6.5	22.0	47.7	17.1	41.8	23.4	23.9	20.2	28.1	23.1	35.4
UAN	2.9	9.4	0.7	2.5	7.6	3.4	7.4	0.4	0.4	0.5	0.0	0.4	5.0
Other Straight N	2.1	2.2	0.0	0.8	5.7	1.2	2.5	0.6	0.2	0.7	0.0	0.6	1.8
Triple Superphosphate	0.5	1.1	0.5	1.0	0.9	1.7	1.0	0.3	0.4	0.2	0.0	0.3	0.7
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	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash	1.6	1.5	2.5	2.1	0.9	7.0	1.9	0.3	0.5	0.5	2.5	0.3	1.3
Other Straight K	0.1	0.1	1.8	23.7	0.1	0.4	1.3	0.1	0.0	0.3	0.0	0.1	0.9
NP	1.2	0.9	1.1	1.8	2.5	4.3	1.4	4.1	3.0	2.9	0.0	4.1	2.4
NK	2.4	0.8	0.6	1.0	1.6	4.3	1.3	6.7	5.9	11.8	0.7	6.8	3.2
PK	8.1	16.3	9.0	36.4	11.1	23.8	15.7	3.1	3.8	3.2	0.0	3.2	11.4
Very High N	6.0	3.3	0.5	0.3	1.7	1.3	2.9	34.6	24.5	34.4	35.1	33.9	13.6
High N	16.8	1.3	2.1	0.0	0.7	3.7	3.0	20.7	27.5	19.7	21.8	21.0	9.2
High P	0.0	0.2	0.5	0.0	0.7	1.6	0.4	0.2	1.3	0.3	0.7	0.4	0.4
High K	9.8	1.4	57.4	3.5	0.9	8.9	5.3	0.9	1.7	1.0	0.0	0.9	3.7
Low N	5.9	1.9	7.2	1.9	3.4	3.0	2.9	0.5	0.2	0.4	4.3	0.5	2.1
Low P	1.7	0.3	3.2	0.4	0.3	10.6	1.3	0.3	1.1	1.1	0.0	0.6	1.0
Equal NPK	7.2	0.5	5.1	0.4	2.1	2.4	1.8	1.1	3.3	0.8	0.3	1.1	1.6
Total Product ('000 tonnes)	**310**	**1710**	**127**	**133**	**423**	**180**	**2883**	**1384**	**144**	**736**	**9**	**1512**	**4395**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table GB3.2 Use of product type by crop group, Great Britain 2005

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	9.8	40.2	1.1	0.5	22.0	26.4	83.4	100.0	1.8	61.8	0.0	16.6	32
Urea	3.9	72.5	0.7	1.3	20.6	1.0	84.1	85.3	8.8	37.5	0.7	15.9	227
Ammonium Nitrate	7.6	70.0	0.7	2.4	16.8	2.6	77.5	92.6	9.8	42.5	0.7	22.5	1555
UAN	4.3	75.7	0.4	1.6	15.2	2.9	97.3	99.2	9.9	57.5	0.0	2.7	218
Other Straight N	9.2	52.5	0.0	1.4	33.7	3.1	88.8	100.0	2.7	55.1	0.0	11.2	80
Triple Superphosphate	5.8	63.3	2.2	4.6	13.7	10.5	87.5	97.7	14.5	27.8	0.0	12.5	33
Single Superphosphate	0.0	89.8	0.0	0.0	0.0	10.2	100.0	0.0	0.0	0.0	0.0	0.0	1
Other Straight P	0.3	83.1	0.0	0.0	5.0	11.6	100.0	0.0	0.0	0.0	0.0	0.0	3
Muriate of Potash	9.6	48.3	5.9	5.1	7.5	23.6	91.9	81.3	15.7	71.2	4.7	8.1	58
Other Straight K	0.8	2.5	6.2	87.1	1.3	2.0	94.3	54.4	0.0	89.6	0.0	5.7	38
NP	9.0	38.0	3.3	5.8	25.6	18.4	40.3	92.5	7.0	34.4	0.0	59.7	104
NK	20.0	35.6	2.1	3.4	18.4	20.5	26.9	91.0	8.3	85.2	0.1	73.1	140
PK	5.5	61.5	2.5	10.6	10.4	9.4	90.5	89.9	11.6	48.8	0.0	9.5	502
Very High N	22.0	65.7	0.7	0.4	8.5	2.8	14.2	93.3	6.9	49.3	0.6	85.8	597
High N	59.8	25.8	3.1	0.0	3.6	7.6	21.5	90.1	12.5	45.6	0.6	78.5	405
High P	0.0	39.1	6.5	0.0	27.9	26.4	66.5	64.5	35.5	35.9	1.2	33.5	16
High K	20.2	15.5	48.2	3.0	2.5	10.6	92.0	90.0	19.0	57.9	0.0	8.0	164
Low N	22.3	39.5	11.2	3.0	17.5	6.5	91.1	85.3	2.7	35.5	4.7	8.9	90
Low P	14.9	16.2	11.2	1.3	3.9	52.5	79.4	49.2	16.9	84.1	0.0	20.6	46
Equal NPK	43.3	17.9	12.6	1.1	16.8	8.3	75.8	92.8	28.9	37.2	0.2	24.2	68
Total Product ('000 tonnes)	**10.8**	**59.3**	**4.4**	**4.6**	**14.7**	**6.2**	**65.6**	**91.5**	**9.5**	**48.7**	**0.6**	**34.4**	**4395**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table GB3.3 Product use by month of application, Great Britain 2005

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	3.8	33.9	36.5	15.1	4.5	5.2	1.1	0.0	0.0	0.0	0.0	32
Urea	0.0	5.3	28.8	39.1	12.8	4.9	7.5	0.3	0.6	0.4	0.2	0.0	227
Ammonium Nitrate	0.1	3.2	29.3	39.7	18.8	4.9	1.9	1.1	0.6	0.3	0.1	0.1	1555
UAN	0.1	5.2	29.6	40.0	22.1	1.2	0.8	0.2	0.6	0.0	0.2	0.0	218
Other Straight N	0.0	10.5	45.5	25.2	9.0	4.3	5.0	0.0	0.2	0.0	0.4	0.0	80
Triple Superphosphate	2.9	12.0	20.3	5.8	4.7	0.5	0.0	16.0	19.9	5.6	8.6	3.7	33
Single Superphosphate	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	89.8	0.0	0.0	0.0	1
Other Straight P	0.0	4.3	3.8	0.0	5.2	1.4	0.0	8.2	77.1	0.0	0.0	0.0	3
Muriate of Potash	2.3	17.7	21.1	19.8	9.8	1.4	0.0	4.5	8.4	1.6	6.1	7.2	58
Other Straight K	1.9	13.3	7.7	2.5	2.9	0.0	0.0	0.0	5.5	8.2	50.6	7.5	38
NP	0.0	6.3	40.2	27.6	10.9	3.3	1.8	2.5	6.6	0.8	0.0	0.0	104
NK	0.0	0.6	13.2	19.5	25.2	25.1	9.2	6.7	0.5	0.1	0.0	0.0	140
PK	3.4	11.8	18.0	8.6	2.3	0.4	0.4	6.1	23.0	14.7	7.8	3.5	502
Very High N	0.2	0.8	20.0	36.4	18.2	12.7	6.8	3.7	0.9	0.2	0.0	0.0	597
High N	0.0	2.8	17.4	44.2	19.9	6.5	5.1	3.7	0.2	0.2	0.0	0.0	405
High P	0.4	1.4	19.4	19.6	13.0	0.8	5.5	3.3	24.0	12.5	0.0	0.0	16
High K	0.0	3.0	35.3	45.1	11.0	0.7	0.2	1.5	0.8	1.9	0.4	0.0	164
Low N	1.2	8.0	31.2	19.4	6.8	1.4	0.5	11.2	11.1	7.8	1.4	0.0	90
Low P	0.0	5.8	52.7	21.3	6.4	5.9	5.3	0.7	1.9	0.0	0.0	0.0	46
Equal NPK	0.1	1.0	24.7	42.8	11.7	5.7	1.7	0.3	10.1	1.8	0.0	0.0	68
Total Product ('000 tonnes)	**0.5**	**4.6**	**25.9**	**33.5**	**15.4**	**5.6**	**3.1**	**2.7**	**4.1**	**2.3**	**1.6**	**0.6**	**4395**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table EW1.1 Total fertiliser use, England & Wales 2005

	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	67	40	41	26	138	43	59	92	17	24	49
Winter wheat	99	59	59	14	198	61	72	196	36	43	1899
Spring barley	95	65	70	29	106	46	60	101	30	42	438
Winter barley	98	66	70	22	138	58	78	136	39	55	498
Oats	91	71	75	22	107	62	72	98	44	54	115
Rye/Triticale/Durum wheat	72	43	52	44	107	50	66	77	22	34	49
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	96	96	96	88	166	110	227	159	105	217	6
2nd Early/Maincrop potatoes	96	90	94	47	175	167	275	168	151	259	141
Sugar beet	93	51	76	35	101	73	147	94	37	112	218
Spring oilseed rape	97	44	58	7	153	56	63	149	24	36	39
Winter oilseed rape	99	64	61	11	205	61	68	203	39	41	494
Linseed	94	40	34	7	75	42	57	70	17	20	49
Forage maize	80	66	51	94	64	57	110	51	37	56	160
Rootcrops for stockfeed	89	40	87	91	94	89	82	84	36	71	35
Leafy forage crops	70	61	61	61	70	27	33	49	16	20	18
Arable silage/Other fodder crops	44	42	32	26	66	57	53	29	24	17	28
Peas - human consumption	4	37	45	2	59	55	66	2	20	30	88
Peas - animal consumption	9	39	43	14	29	56	78	3	21	33	62
Beans - animal consumption	6	34	33	16	34	50	63	2	17	21	127
Vegetables (brassicae)	99	99	97	19	179	76	153	178	75	148	48
Vegetable (other)	31	53	54	5	121	87	119	37	46	65	122
Soft fruit	92	91	92	0	36	30	55	34	27	51	15
Top fruit	84	41	64	0	148	29	105	124	12	67	107
Other tillage	59	50	58	13	84	57	92	49	29	53	78
All tillage	90	60	61	20	169	63	83	152	37	51	4883
Grass under 5 years old	78	56	60	47	163	36	56	127	20	34	695
Grass 5 years and over	62	49	50	39	101	28	33	63	14	16	2126
All grass	65	50	51	40	112	29	37	72	15	19	2821
All crops and grass	77	55	56	30	144	47	61	110	25	34	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.2 Use of straight fertiliser, England & Wales 2005

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	65	3	5	126	61	92	81	2	5	49
Winter wheat	96	7	7	192	74	90	184	5	7	1899
Spring barley	69	4	6	104	50	106	71	2	7	438
Winter barley	93	1	6	133	73	90	123	1	6	498
Oats	82	4	9	109	65	96	89	3	9	115
Rye/Triticale/Durum wheat	56	6	5	107	49	30	60	3	1	49
Seed potatoes	-	-	-	-	-	-	-	-	-	0
Early potatoes	18	18	18	244	151	301	44	27	55	6
2nd Early/Maincrop potatoes	44	3	20	106	74	140	47	2	28	141
Sugar beet	85	3	28	100	85	164	85	2	46	218
Spring oilseed rape	97	3	18	149	55	69	144	2	12	39
Winter oilseed rape	97	5	7	194	68	71	188	3	5	494
Linseed	93	13	7	73	33	79	68	4	5	49
Forage maize	39	2	26	72	57	137	28	1	35	160
Rootcrops for stockfeed	19	0	46	94	0	2	18	0	1	35
Leafy forage crops	26	0	0	74	0	0	19	0	0	18
Arable silage/Other fodder crops	18	10	0	83	83	0	15	9	0	28
Peas - human consumption	4	3	12	59	107	89	2	3	11	88
Peas - animal consumption	6	1	5	33	115	84	2	1	4	62
Beans - animal consumption	3	5	4	42	68	89	1	3	4	127
Vegetables (brassicae)	58	2	0	80	151	0	46	3	0	48
Vegetable (other)	30	5	7	106	73	108	31	4	8	122
Soft fruit	1	0	31	26	0	74	0	0	23	15
Top fruit	72	21	47	153	27	102	110	6	48	107
Other tillage	53	0	11	76	0	129	41	0	14	78
All tillage	81	5	9	167	69	103	135	4	9	4883
Grass under 5 years old	46	1	2	148	71	79	68	1	2	695
Grass 5 years and over	24	0	0	99	76	90	23	0	0	2126
All grass	27	0	1	111	74	85	30	0	1	2821
All crops and grass	53	3	5	152	70	101	80	2	5	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.3 Use of compound fertiliser, England & Wales 2005

	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	25	36	36	43	41	54	11	15	19	49
Winter wheat	16	53	53	77	59	68	12	31	36	1899
Spring barley	42	62	64	71	45	55	30	28	35	438
Winter barley	19	65	65	67	58	76	13	38	49	498
Oats	17	69	69	52	59	65	9	41	45	115
Rye/Triticale/Durum wheat	19	37	47	83	51	70	16	19	33	49
Seed potatoes	-	-	-	-	-	-	-	-	-	0
Early potatoes	77	77	77	147	100	209	114	78	162	6
2nd Early/Maincrop potatoes	78	88	86	156	168	269	122	149	231	141
Sugar beet	12	48	49	79	72	135	9	35	66	218
Spring oilseed rape	10	41	40	54	56	60	6	23	24	39
Winter oilseed rape	28	59	55	56	60	67	16	36	37	494
Linseed	5	28	28	37	46	52	2	13	14	49
Forage maize	67	64	28	35	56	75	23	36	21	160
Rootcrops for stockfeed	73	40	87	90	89	81	66	36	71	35
Leafy forage crops	53	61	61	57	27	33	30	16	20	18
Arable silage/Other fodder crops	26	32	32	54	49	53	14	16	17	28
Peas - human consumption	0	34	34	0	51	56	0	17	19	88
Peas - animal consumption	3	37	37	20	54	77	1	20	29	62
Beans - animal consumption	3	29	29	26	47	59	1	14	17	127
Vegetables (brassicae)	92	97	97	142	75	153	131	72	148	48
Vegetable (other)	8	48	47	72	89	120	6	43	57	122
Soft fruit	91	91	91	37	30	31	33	27	28	15
Top fruit	32	21	40	42	30	47	14	6	19	107
Other tillage	19	50	50	47	57	79	9	29	40	78
All tillage	22	55	54	75	62	78	17	34	42	4883
Grass under 5 years old	55	55	59	109	35	55	59	20	32	695
Grass 5 years and over	48	49	49	82	27	32	40	13	16	2126
All grass	49	50	51	86	29	36	42	14	18	2821
All crops and grass	36	52	52	83	45	57	30	24	30	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.4 Use of lime, England & Wales 2005

	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	49
Winter wheat	2.6	0.7	0.4	0.2	0.3	4.2	3.6	4.3	3.4	10.8	61.8	8.4	88	1899
Spring barley	4.0	0.1	1.2	-	1.1	6.5	4.1	9.9	4.9	-	2.9	4.2	31	438
Winter barley	2.9	0.5	0.8	0.1	1.1	5.4	3.9	4.1	4.5	4.9	18.8	6.9	37	498
Oats	-	-	-	-	-	-	-	-	-	-	-	-	4	115
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	3	49
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	6
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	2	141
Sugar beet	5.7	1.8	-	8.8	1.8	17.8	4.6	4.9	-	9.1	7.8	7.2	40	218
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	39
Winter oilseed rape	4.9	1.8	0.7	0.3	1.0	8.6	4.8	4.8	4.3	3.7	17.8	6.1	36	494
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	49
Forage maize	12.2	-	1.1	-	6.2	19.4	4.4	-	3.9	-	3.5	4.1	27	160
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	-	-	1	35
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	2	18
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	3	28
Peas - human consumption	2.1	3.4	-	-	1.3	6.8	2.2	5.0	-	-	1.1	3.4	5	88
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	62
Beans - animal consumption	0.2	5.5	-	-	-	5.7	4.9	5.4	-	-	-	5.4	5	127
Vegetables (brassicae)	7.1	11.1	-	35.0	0.2	53.4	2.4	5.0	-	11.1	0.6	8.7	10	48
Vegetable (other)	1.3	2.2	0.6	-	6.2	10.4	3.4	3.7	4.9	-	0.8	2.0	18	122
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	15
Top fruit	-	0.2	-	-	5.5	5.7	-	3.8	-	-	0.4	0.5	11	107
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	4	78
All tillage	3.2	1.0	0.5	0.8	1.0	6.5	4.0	4.8	4.2	9.8	15.2	6.5	335	4883
Grass under 5 years old	2.4	-	0.3	-	2.7	5.4	4.7	-	3.3	-	13.3	8.9	37	695
Grass 5 years and over	1.4	0.2	0.9	0.1	1.3	3.8	7.2	1.1	5.1	4.9	2.2	4.8	81	2126
All grass	1.6	0.1	0.8	0.1	1.5	4.1	6.7	1.1	5.0	4.9	5.2	5.6	118	2821
All crops and grass	2.3	0.6	0.7	0.4	1.2	5.2	4.9	4.3	4.7	9.5	8.9	6.1	453	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.5 Percentage of crop area by field application rate - N, England & Wales 2005

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	33	0	4	0	15	6	8	27	4	1	1	1	-	-	-	-	-	-	49
Winter wheat	1	0	2	2	4	4	6	14	19	21	11	7	4	2	2	-	-	-	1899
Spring barley	5	2	4	12	21	26	19	9	1	1	1	-	-	-	-	-	-	-	438
Winter barley	2	1	2	4	10	18	24	25	9	1	2	-	-	-	-	-	-	-	498
Oats	9	1	4	8	23	25	18	10	0	2	-	-	-	-	-	-	-	-	115
Rye/Triticale/Durum wheat	28	6	11	10	6	7	14	5	11	2	-	-	-	-	-	-	-	-	49
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	4	0	0	0	0	12	30	0	35	0	18	-	-	-	-	-	-	-	6
2nd Early/Maincrop potatoes	4	5	11	5	7	7	8	8	15	15	6	4	4	-	-	-	-	-	141
Sugar beet	7	1	9	10	20	24	21	6	2	-	-	-	-	-	-	-	-	-	218
Spring oilseed rape	3	0	0	2	7	10	38	4	21	17	-	-	-	-	-	-	-	-	39
Winter oilseed rape	1	0	1	3	3	3	5	7	20	25	19	6	3	2	-	-	-	-	494
Linseed	6	11	7	28	30	12	6	-	-	-	-	-	-	-	-	-	-	-	49
Forage maize	20	18	14	16	17	10	3	1	1	-	-	-	-	-	-	-	-	-	160
Rootcrops for stockfeed	11	0	4	6	54	12	11	1	1	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	30	4	2	27	35	1	-	-	-	-	-	-	-	-	-	-	-	-	18
Arable silage/Other fodder crops	56	9	3	21	2	9	-	-	-	-	-	-	-	-	-	-	-	-	28
Peas - human consumption	96	2	1	0	0	0	0	1	-	-	-	-	-	-	-	-	-	-	88
Peas - animal consumption	91	2	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62
Beans - animal consumption	94	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	1	6	2	1	1	20	3	18	1	0	25	20	2	-	-	-	-	-	48
Vegetable (other)	69	2	3	1	5	3	8	4	5	-	-	-	-	-	-	-	-	-	122
Soft fruit	8	21	31	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Top fruit	16	20	8	2	6	4	39	1	-	-	-	-	-	-	-	-	-	-	107
Other tillage	41	1	8	14	22	1	10	3	-	-	-	-	-	-	-	-	-	-	78
All tillage	10	1	3	4	8	8	10	12	13	13	8	4	2	1	1	-	-	-	4883
Grass under 5 years old	22	1	6	12	8	7	10	7	5	5	3	6	1	3	2	0	1	2	695
Grass 5 years and over	38	2	12	16	9	5	5	4	2	2	1	0	1	1	1	-	-	-	2126
All grass	35	1	12	16	9	5	6	5	3	2	1	1	1	1	1	0	0	1	2821
All crops and grass	23	1	8	10	8	7	8	8	7	8	4	3	2	1	1	0	0	1	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.6 Percentage of crop area by field application rate – P_2O_5, England & Wales 2005

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	60	10	11	15	3	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Winter wheat	41	4	13	26	13	3	1	-	-	-	-	-	-	-	-	-	-	-	1899
Spring barley	35	13	24	20	6	0	1	-	-	-	-	-	-	-	-	-	-	-	438
Winter barley	34	5	14	32	13	1	0	1	-	-	-	-	-	-	-	-	-	-	498
Oats	29	9	5	33	24	1	-	-	-	-	-	-	-	-	-	-	-	-	115
Rye/Triticale/Durum wheat	57	3	15	19	6	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	4	0	0	29	0	12	30	18	6	-	-	-	-	-	-	-	-	-	6
2nd Early/Maincrop potatoes	10	8	7	9	5	5	9	9	17	8	4	4	1	2	-	-	-	-	141
Sugar beet	49	2	13	18	8	7	3	1	-	-	-	-	-	-	-	-	-	-	218
Spring oilseed rape	56	3	9	27	5	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Winter oilseed rape	36	5	14	31	12	2	1	1	-	-	-	-	-	-	-	-	-	-	494
Linseed	60	13	16	7	2	2	-	-	-	-	-	-	-	-	-	-	-	-	49
Forage maize	34	11	14	29	6	2	2	-	-	-	-	-	-	-	-	-	-	-	160
Rootcrops for stockfeed	60	2	7	4	11	3	8	-	-	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	39	39	21	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Arable silage/Other fodder crops	58	12	6	7	14	3	-	-	-	-	-	-	-	-	-	-	-	-	28
Peas - human consumption	63	3	13	13	6	0	1	-	-	-	-	-	-	-	-	-	-	-	88
Peas - animal consumption	61	2	13	16	5	3	-	-	-	-	-	-	-	-	-	-	-	-	62
Beans - animal consumption	66	5	9	15	4	1	-	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	1	0	19	51	11	2	0	10	1	0	0	4	-	-	-	-	-	-	48
Vegetable (other)	47	3	3	30	6	6	1	0	1	-	-	-	-	-	-	-	-	-	122
Soft fruit	9	16	70	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Top fruit	59	25	10	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	107
Other tillage	50	2	13	30	1	0	3	-	-	-	-	-	-	-	-	-	-	-	78
All tillage	40	6	13	25	11	2	1	1	-	-	-	-	-	-	-	-	-	-	4883
Grass under 5 years old	44	19	24	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	695
Grass 5 years and over	51	25	19	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2126
All grass	50	24	19	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2821
All crops and grass	45	15	17	14	6	1	1	-	-	-	-	-	-	-	-	-	-	-	7704

Source: British Survey of Fertiliser Practice 2005

Table EW1.7 Percentage of crop area by field application rate – K_2O, England & Wales 2005

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	59	7	7	10	15	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Winter wheat	41	3	11	17	19	6	2	1	-	-	-	-	-	-	-	-	-	-	1899
Spring barley	30	7	21	23	13	4	2	1	-	-	-	-	-	-	-	-	-	-	438
Winter barley	30	3	8	16	27	11	3	1	1	-	-	-	-	-	-	-	-	-	498
Oats	25	5	13	17	29	4	2	4	-	-	-	-	-	-	-	-	-	-	115
Rye/Triticale/Durum wheat	48	7	12	5	21	8	-	-	-	-	-	-	-	-	-	-	-	-	49
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	4	0	0	0	0	0	12	0	0	30	29	6	0	18	-	-	-	-	6
2nd Early/Maincrop potatoes	6	5	5	4	0	7	2	2	6	10	11	11	5	12	1	2	2	8	141
Sugar beet	24	3	3	4	13	16	13	9	6	1	2	2	1	1	-	-	-	-	218
Spring oilseed rape	42	6	9	17	26	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Winter oilseed rape	39	2	13	24	13	6	1	1	-	-	-	-	-	-	-	-	-	-	494
Linseed	66	4	11	6	13	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Forage maize	49	3	6	10	7	7	3	4	5	3	5	-	-	-	-	-	-	-	160
Rootcrops for stockfeed	13	2	4	49	13	4	0	2	8	5	1	-	-	-	-	-	-	-	35
Leafy forage crops	39	39	9	3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Arable silage/Other fodder crops	68	9	9	7	3	3	-	-	-	-	-	-	-	-	-	-	-	-	28
Peas - human consumption	55	3	11	14	13	1	0	3	-	-	-	-	-	-	-	-	-	-	88
Peas - animal consumption	57	0	8	16	11	1	4	0	1	-	-	-	-	-	-	-	-	-	62
Beans - animal consumption	67	4	5	8	12	3	1	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	3	0	0	12	22	2	1	2	28	22	4	4	-	-	-	-	-	-	48
Vegetable (other)	46	3	2	9	14	4	11	0	5	3	0	0	0	4	-	-	-	-	122
Soft fruit	8	16	45	1	0	0	30	-	-	-	-	-	-	-	-	-	-	-	15
Top fruit	36	9	1	1	12	22	3	16	1	-	-	-	-	-	-	-	-	-	107
Other tillage	42	1	13	6	19	10	3	3	0	0	1	-	-	-	-	-	-	-	78
All tillage	39	3	11	17	17	6	3	2	1	1	1	-	-	-	-	-	-	-	4883
Grass under 5 years old	40	15	19	8	8	4	3	2	1	-	-	-	-	-	-	-	-	-	695
Grass 5 years and over	50	22	18	5	3	1	-	-	-	-	-	-	-	-	-	-	-	-	2126
All grass	49	21	19	5	4	1	1	-	-	-	-	-	-	-	-	-	-	-	2821
All crops and grass	44	13	15	11	10	4	2	1	1	-	-	-	-	-	-	-	-	-	7704

Source: British Survey of Fertiliser Practice 2005

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2005

	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	57	43	42	26	98	27	27	56	12	11	1276
Grazed mown	78	62	65	63	125	31	45	98	19	30	1268
All grazings	65	50	51	40	110	28	36	72	14	18	2544
Cut for silage - grazed	87	69	75	69	141	32	49	122	22	37	868
Cut for silage - not grazed	82	64	71	56	135	37	58	111	23	41	132
All cut for silage	86	68	74	68	140	33	50	121	22	37	1000
Cut for hay - grazed	61	47	47	52	79	26	31	48	12	14	447
Cut for hay - not grazed	59	50	55	20	92	40	48	54	20	26	90
All cut for hay	61	47	48	48	80	27	33	49	13	16	537
All mowings	78	61	65	61	125	31	46	97	19	30	1473
All grass	65	50	51	40	112	29	37	72	15	19	2821

Source: British Survey of Fertiliser Practice 2005

Table EW2.2 Percentage of grass area by field application rate - N, England & Wales 2005

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	43	2	14	14	9	3	4	3	2	1	1	1	0	1	1	-	-	-	1276
Grazed mown	22	1	9	17	8	9	9	8	5	4	2	2	1	2	1	-	-	-	1268
All grazings	35	1	12	15	9	5	6	5	3	2	1	1	1	1	1	-	-	-	2544
Cut for silage - grazed	13	0	6	15	8	11	12	10	6	5	2	3	2	2	2	-	-	-	868
Cut for silage - not grazed	18	1	5	22	15	5	7	3	4	7	1	3	2	4	2	-	-	-	132
All cut for silage	14	0	6	16	9	11	11	9	6	6	2	3	2	2	2	-	-	-	1000
Cut for hay - grazed	39	2	15	21	8	6	4	3	2	1	-	-	-	-	-	-	-	-	447
Cut for hay - not grazed	41	1	7	17	16	3	11	1	-	-	-	-	-	-	-	-	-	-	90
All cut for hay	39	1	14	20	9	6	5	3	1	1	-	-	-	-	-	-	-	-	537
All mowings	22	1	9	17	9	9	9	7	4	4	2	2	1	2	1	-	-	-	1473
All grass	35	1	12	16	9	5	6	5	3	2	1	1	1	1	1	-	-	-	2821

Source: British Survey of Fertiliser Practice 2005

Table EW2.3 Percentage of grass area by field application rate - P_2O_5, England & Wales 2005

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	57	23	15	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1276
Grazed mown	38	26	26	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1268
All grazings	50	24	19	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2544
Cut for silage - grazed	31	27	30	8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	868
Cut for silage - not grazed	36	27	21	9	3	4	-	-	-	-	-	-	-	-	-	-	-	-	132
All cut for silage	32	27	29	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	1000
Cut for hay - grazed	53	25	18	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	447
Cut for hay - not grazed	50	18	18	4	2	7	-	-	-	-	-	-	-	-	-	-	-	-	90
All cut for hay	53	24	18	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	537
All mowings	39	25	26	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1473
All grass	50	24	19	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2821

Source: British Survey of Fertiliser Practice 2005

Table EW2.4 Percentage of grass area by field application rate - K_2O, England & Wales 2005

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	58	22	16	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1276
Grazed mown	35	20	22	10	7	2	2	1	1	-	-	-	-	-	-	-	-	-	1268
All grazings	49	21	19	5	3	1	1	-	-	-	-	-	-	-	-	-	-	-	2544
Cut for silage - grazed	25	21	24	13	9	3	2	1	1	-	-	-	-	-	-	-	-	-	868
Cut for silage - not grazed	29	20	25	9	5	2	4	4	1	0	2	-	-	-	-	-	-	-	132
All cut for silage	26	20	25	13	9	3	2	1	1	-	-	-	-	-	-	-	-	-	1000
Cut for hay - grazed	53	22	17	3	4	1	-	-	-	-	-	-	-	-	-	-	-	-	447
Cut for hay - not grazed	45	14	21	4	13	0	0	0	1	-	-	-	-	-	-	-	-	-	90
All cut for hay	52	21	18	3	5	1	-	-	-	-	-	-	-	-	-	-	-	-	537
All mowings	35	20	22	10	7	2	2	1	1	-	-	-	-	-	-	-	-	-	1473
All grass	49	21	19	5	4	1	1	-	-	-	-	-	-	-	-	-	-	-	2821

Source: British Survey of Fertiliser Practice 2005

Table EW3.0 Product and nutrient use by month of application, England & Wales 2005

(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	4	31	38	18	4	3	1	1940
Straight P	27	5	8	3	3	10	16	5	5	1	0	16	35
Straight K	7	5	25	8	2	15	15	13	6	1	0	3	91
Compounds	8	4	2	1	1	6	23	25	14	7	4	5	1641
All Fertilisers	4	2	2	1	1	5	27	31	15	5	3	3	3707

(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	4	29	37	18	6	3	2	888
P_2O_5	15	7	4	2	2	8	23	20	9	3	2	6	205
K_2O	12	6	5	2	2	9	22	20	10	4	2	5	276
Total	5	3	2	1	1	5	27	31	15	5	3	3	1370

Note: 'Product 'refers to the total tonnage of the products used by farmers in the survey year 2005;
'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 2005

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2005

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	0.7	0.3	0.1	1.5	4.1	1.0	0.5	0.1	0.5	0.0	0.4	0.8
Urea	3.6	8.4	1.1	1.9	9.3	1.2	7.1	2.5	2.5	2.1	3.1	2.7	5.7
Ammonium Nitrate	38.3	49.3	6.9	22.0	48.2	18.1	43.0	26.5	24.4	23.0	30.4	26.4	37.8
UAN	3.5	10.0	0.8	2.5	7.9	3.6	8.0	0.4	0.5	0.5	0.0	0.4	5.6
Other Straight N	1.7	2.0	0.0	0.8	5.9	1.3	2.4	0.7	0.2	0.8	0.0	0.7	1.8
Triple Superphosphate	1.0	1.1	0.5	1.0	0.9	1.8	1.1	0.3	0.4	0.2	0.0	0.2	0.8
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	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash	2.3	1.5	2.7	2.1	1.0	7.4	1.9	0.2	0.6	0.5	2.7	0.3	1.4
Other Straight K	0.2	0.1	2.0	23.7	0.1	0.4	1.4	0.1	0.0	0.3	0.0	0.2	1.0
NP	0.3	0.8	0.9	1.8	2.1	4.5	1.3	3.3	2.7	2.4	0.0	3.2	1.9
NK	2.5	0.8	0.7	1.0	1.4	4.5	1.2	7.7	6.6	13.9	0.8	7.8	3.3
PK	14.5	16.5	10.1	36.4	12.0	24.8	17.0	3.2	3.8	3.4	0.0	3.3	12.7
Very High N	5.5	3.3	0.5	0.3	1.8	1.3	2.8	31.6	21.6	32.0	38.0	30.8	11.6
High N	17.5	1.2	1.8	0.0	0.7	3.5	2.3	20.3	28.8	17.2	15.4	20.4	8.0
High P	0.0	0.1	0.0	0.0	0.5	0.5	0.2	0.2	1.5	0.2	0.8	0.3	0.2
High K	2.9	1.3	57.9	3.5	1.0	8.1	4.4	1.0	1.9	1.2	0.0	1.0	3.3
Low N	1.4	1.4	4.7	1.9	2.6	1.5	1.8	0.5	0.1	0.2	4.7	0.5	1.4
Low P	1.5	0.4	3.6	0.4	0.4	11.2	1.3	0.3	1.3	0.9	0.0	0.6	1.1
Equal NPK	1.4	0.4	5.5	0.4	1.5	1.9	1.0	0.8	3.0	0.7	0.4	0.8	0.9
Total Product ('000 tonnes)	**159**	**1574**	**113**	**133**	**384**	**170**	**2532**	**1088**	**125**	**576**	**8**	**1175**	**3707**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table EW3.2 Use of product type by crop group, England & Wales 2005

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	4.9	42.0	1.2	0.5	23.3	28.1	83.4	100.0	1.9	59.5	0.0	16.6	30
Urea	3.1	73.9	0.7	1.4	19.8	1.1	84.7	84.3	9.9	37.5	0.8	15.3	212
Ammonium Nitrate	5.6	71.2	0.7	2.7	17.0	2.8	77.8	92.8	9.8	42.7	0.8	22.2	1400
UAN	2.8	77.3	0.4	1.6	14.9	3.0	98.0	98.9	13.9	69.3	0.0	2.0	208
Other Straight N	4.4	53.1	0.0	1.7	37.2	3.6	88.7	100.0	3.1	57.7	0.0	11.3	68
Triple Superphosphate	6.0	64.3	2.1	4.7	12.0	10.8	90.7	96.7	18.5	30.5	0.0	9.3	31
Single Superphosphate	0.0	89.8	0.0	0.0	0.0	10.2	100.0	0.0	0.0	0.0	0.0	0.0	1
Other Straight P	0.0	83.4	0.0	0.0	5.0	11.6	100.0	0.0	0.0	0.0	0.0	0.0	3
Muriate of Potash	7.6	47.4	6.2	5.6	7.8	25.5	93.2	75.5	20.5	79.5	6.1	6.8	53
Other Straight K	0.8	2.5	6.2	87.1	1.3	2.0	94.3	54.4	0.0	89.6	0.0	5.7	38
NP	1.5	37.9	3.2	7.6	25.6	24.2	45.8	96.5	8.9	36.3	0.0	54.2	69
NK	12.6	38.9	2.5	4.1	17.5	24.4	25.4	91.7	9.0	87.4	0.1	74.6	123
PK	5.4	60.3	2.7	11.2	10.7	9.8	91.6	90.0	12.1	49.4	0.0	8.4	470
Very High N	12.6	73.3	0.8	0.5	9.6	3.2	16.2	95.0	7.5	51.0	0.9	83.8	431
High N	48.5	32.7	3.5	0.0	4.9	10.4	19.3	92.0	15.0	41.3	0.5	80.7	297
High P	0.0	32.1	0.0	0.0	45.3	22.6	50.5	51.9	48.1	26.5	1.6	49.5	8
High K	4.2	18.1	58.1	4.1	3.2	12.3	90.8	91.7	21.3	59.2	0.0	9.2	124
Low N	4.9	50.2	11.9	5.6	21.9	5.6	89.0	96.8	3.2	24.1	6.8	11.0	50
Low P	7.4	17.6	12.2	1.4	4.2	57.2	83.0	43.4	23.2	79.4	0.0	17.0	40
Equal NPK	9.1	27.0	25.2	2.3	23.5	12.9	73.1	94.5	41.9	47.0	0.3	26.9	34
All Fertilisers	**6.3**	**62.2**	**4.5**	**5.2**	**15.2**	**6.7**	**68.3**	**92.6**	**10.7**	**49.0**	**0.7**	**31.7**	**3707**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table EW3.3 Product use by month of application, England & Wales 2005

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	4.0	36.0	37.2	11.4	4.7	5.5	1.2	0.0	0.0	0.0	0.0	30
Urea	0.0	5.6	29.9	37.2	13.4	4.6	7.8	0.3	0.7	0.4	0.1	0.0	212
Ammonium Nitrate	0.1	3.3	30.3	38.9	18.6	4.8	2.0	1.1	0.5	0.3	0.0	0.0	1400
UAN	0.1	5.4	30.2	39.6	21.6	1.1	0.8	0.2	0.5	0.0	0.2	0.0	208
Other Straight N	0.0	12.3	48.5	21.7	6.0	5.0	5.9	0.0	0.2	0.0	0.4	0.0	68
Triple Superphosphate	3.1	10.8	18.2	6.0	4.9	0.5	0.0	16.9	20.4	6.0	9.3	4.0	31
Single Superphosphate	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	89.8	0.0	0.0	0.0	1
Other Straight P	0.0	4.0	3.8	0.0	5.2	1.4	0.0	8.3	77.3	0.0	0.0	0.0	3
Muriate of Potash	2.5	16.8	20.2	19.9	9.0	1.5	0.0	4.8	8.7	1.8	6.8	8.0	53
Other Straight K	1.9	13.2	7.7	2.5	2.9	0.0	0.0	0.0	5.5	8.2	50.6	7.5	38
NP	0.0	9.3	39.6	22.7	10.1	3.6	2.5	3.7	8.0	0.5	0.0	0.0	69
NK	0.0	0.7	13.8	15.8	26.4	26.0	9.3	7.6	0.4	0.1	0.0	0.0	123
PK	3.2	11.8	18.4	8.9	2.2	0.4	0.2	6.5	23.3	13.6	8.1	3.4	470
Very High N	0.2	1.2	23.4	31.8	19.4	11.9	6.6	3.8	1.2	0.3	0.0	0.0	431
High N	0.0	3.8	19.2	37.7	22.6	6.0	5.4	4.8	0.3	0.1	0.0	0.0	297
High P	0.8	0.3	38.0	23.9	4.7	0.1	0.1	0.1	31.5	0.5	0.0	0.0	8
High K	0.0	4.0	36.6	45.4	8.8	0.2	0.3	1.9	1.0	1.1	0.6	0.0	124
Low N	2.1	9.5	30.7	10.5	6.3	1.4	0.4	14.4	14.2	8.5	2.1	0.0	50
Low P	0.0	6.6	59.9	16.5	5.8	4.6	4.0	0.8	1.8	0.0	0.0	0.0	40
Equal NPK	0.3	2.0	19.8	35.5	17.4	9.4	0.6	0.0	13.4	1.7	0.0	0.0	34
All Fertilisers	**0.6**	**5.1**	**27.2**	**31.2**	**15.4**	**5.3**	**3.1**	**2.9**	**4.4**	**2.2**	**1.8**	**0.7**	**3707**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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 2005

Table EW4.1 Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2005

		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	94	60	62	32	172	58	76	163	35	47	288
	All grass	66	32	38	41	129	30	43	85	10	16	225
	All crops & grass	80	46	49	37	154	48	63	122	22	31	513
Anglia	All tillage	90	55	50	8	174	71	100	156	39	50	940
	All grass	27	11	11	7	84	23	32	22	2	4	100
	All crops & grass	82	50	46	7	171	70	98	140	35	45	1040
Northern	All tillage	90	82	84	35	154	60	80	138	49	67	278
	All grass	68	60	59	42	92	26	32	62	16	19	435
	All crops & grass	72	64	64	40	107	35	44	78	22	28	713
North East	All tillage	92	56	62	18	176	64	91	162	35	56	957
	All grass	68	50	51	39	111	30	39	76	15	20	360
	All crops & grass	82	53	57	27	153	50	71	125	27	41	1317
North Mercia	All tillage	87	56	70	50	142	52	83	123	29	58	279
	All grass	65	45	50	48	115	30	39	75	14	19	225
	All crops & grass	73	49	57	49	127	39	59	93	19	34	504
South Mercia	All tillage	87	62	60	22	157	60	79	137	38	47	349
	All grass	62	30	32	21	103	29	38	64	9	12	217
	All crops & grass	75	47	47	22	136	51	66	102	24	31	566
East Midland	All tillage	90	59	57	12	170	60	76	154	36	43	869
	All grass	45	27	27	27	110	28	34	49	7	9	234
	All crops & grass	78	50	49	16	161	56	70	125	28	34	1103
South East	All tillage	87	61	66	10	192	62	73	167	38	48	603
	All grass	39	21	22	19	103	30	41	40	6	9	284
	All crops & grass	67	45	48	14	170	56	67	114	25	32	887
South West	All tillage	81	73	71	54	127	65	89	104	47	63	226
	All grass	76	69	69	62	136	31	42	103	21	29	347
	All crops & grass	77	70	70	60	134	39	53	103	27	37	573
Wales	All tillage	92	57	84	71	123	53	66	113	30	56	94
	All grass	76	69	69	47	113	29	35	86	20	24	394
	All crops & grass	77	68	70	49	114	31	38	88	21	27	488

Source: British Survey of Fertiliser Practice 2005

Table EW5.1 Average fertiliser practice on dairy farms, England & Wales 2005

	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	57	39	39	32	96	22	27	55	9	11	9
Winter wheat	97	66	62	55	162	43	57	157	28	35	75
Spring barley	99	77	72	96	67	31	32	67	24	23	35
Winter barley	86	65	72	68	105	42	50	90	27	36	27
Oats	79	11	23	58	71	38	65	56	4	15	8
Rye/Triticale/Durum wheat	50	0	0	100	81	0	0	41	0	0	7
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	100	61	61	88	122	122	161	122	75	98	6
Sugar beet	-	-	-	-	-	-	-	-	-	-	3
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	82	51	51	60	185	28	52	152	14	27	6
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	82	66	58	99	55	55	108	45	37	62	73
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	1
Arable silage/Other fodder crops	18	18	18	55	73	13	46	13	2	9	6
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	84	62	58	76	103	47	74	87	29	42	265
Grass under 5 years old	85	57	65	66	209	32	63	179	18	41	172
Grass 5 years and over	82	60	64	66	142	32	42	117	19	27	472
All grass	83	59	64	66	155	32	46	129	19	30	644
All crops and grass	83	60	63	67	147	34	50	122	20	32	909

Source: British Survey of Fertiliser Practice 2005

Table EW5.2 Average fertiliser practice on cattle and sheep farms, England & Wales 2005

	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	98	72	74	32	172	42	47	170	31	35	55
Spring barley	96	67	87	70	79	35	50	76	23	44	48
Winter barley	91	74	74	41	127	54	62	116	40	45	37
Oats	93	96	87	56	89	62	67	83	60	58	13
Rye/Triticale/Durum wheat	72	15	72	94	85	40	45	61	6	32	5
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	1
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	82	82	7	186	47	52	186	39	43	7
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	82	67	34	96	63	61	68	51	41	23	23
Rootcrops for stockfeed	93	29	95	96	91	77	70	85	23	67	13
Leafy forage crops	55	60	60	68	60	25	25	33	15	15	11
Arable silage/Other fodder crops	66	66	66	34	68	62	62	45	41	41	5
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	31	41	41	66	38	28	21	12	11	9	8
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	88	65	73	54	121	47	55	107	31	40	234
Grass under 5 years old	80	68	68	53	116	34	42	92	23	29	186
Grass 5 years and over	58	52	51	39	75	24	26	43	13	13	894
All grass	59	53	53	40	80	25	28	47	13	15	1080
All crops and grass	61	54	54	41	84	27	30	51	15	16	1314

Source: British Survey of Fertiliser Practice 2005

Table EW5.3 Average fertiliser practice on other livestock/mixed farms, England & Wales 2005

	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	48	48	51	34	147	54	83	71	26	42	8
Winter wheat	97	58	60	34	188	57	73	184	33	44	279
Spring barley	77	60	58	45	101	39	54	78	23	31	67
Winter barley	98	73	73	40	144	66	87	141	48	63	114
Oats	77	58	61	42	98	57	63	76	33	38	26
Rye/Triticale/Durum wheat	56	52	33	34	120	52	67	68	27	22	13
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	85	85	85	100	170	189	231	144	161	196	15
Sugar beet	83	27	35	59	110	69	230	91	19	80	13
Spring oilseed rape	100	15	28	27	139	42	74	139	6	21	11
Winter oilseed rape	100	55	64	24	200	61	73	200	34	47	60
Linseed	-	-	-	-	-	-	-	-	-	-	2
Forage maize	70	56	34	94	82	54	128	57	30	43	34
Rootcrops for stockfeed	91	100	100	95	114	107	131	104	107	131	11
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	1
Arable silage/Other fodder crops	20	13	13	31	101	50	50	20	6	6	6
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	4
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Beans - animal consumption	0	23	18	33	0	63	88	0	14	16	29
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetable (other)	0	16	26	23	130	61	71	1	10	18	14
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	78	83	83	29	89	57	45	69	47	37	9
All tillage	86	57	57	39	166	60	80	143	34	46	723
Grass under 5 years old	77	53	58	45	175	41	61	134	22	36	139
Grass 5 years and over	59	40	37	21	108	35	44	63	14	16	244
All grass	63	43	42	27	128	37	50	81	16	21	383
All crops and grass	74	50	50	33	150	50	67	112	25	34	1106

Source: British Survey of Fertiliser Practice 2005

Table EW5.4 Average fertiliser practice on cropping/horticultural farms, England & Wales 2005

	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	72	39	41	19	149	48	65	108	19	27	30
Winter wheat	99	59	59	9	201	63	73	200	37	43	1490
Spring barley	98	65	70	16	113	50	64	112	32	45	288
Winter barley	100	63	69	12	139	57	79	139	36	54	320
Oats	96	75	80	8	114	63	75	109	47	60	68
Rye/Triticale/Durum wheat	82	57	63	21	113	51	75	93	29	47	24
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	96	96	96	88	166	110	227	159	105	217	6
2nd Early/Maincrop potatoes	99	93	97	40	177	166	281	175	155	274	118
Sugar beet	94	53	79	33	101	73	145	95	38	114	201
Spring oilseed rape	97	51	66	1	157	57	61	152	29	41	27
Winter oilseed rape	99	65	60	9	206	62	68	204	40	41	421
Linseed	94	42	35	7	74	42	57	69	17	20	47
Forage maize	93	80	66	67	76	64	124	70	51	82	30
Rootcrops for stockfeed	100	28	46	66	84	81	80	84	22	37	7
Leafy forage crops	100	76	76	42	80	29	42	80	22	32	5
Arable silage/Other fodder crops	61	61	35	8	57	63	48	35	38	17	11
Peas - human consumption	4	37	46	2	59	55	66	2	21	31	84
Peas - animal consumption	8	40	44	13	27	56	79	2	22	35	56
Beans - animal consumption	6	37	37	8	33	49	63	2	18	23	88
Vegetables (brassicae)	99	99	99	18	181	75	153	180	74	151	46
Vegetable (other)	33	56	57	4	121	88	122	40	49	69	106
Soft fruit	92	91	92	0	36	30	55	34	27	51	15
Top fruit	83	43	63	0	90	29	102	75	12	64	106
Other tillage	59	49	58	12	84	57	96	49	28	56	67
All tillage	91	60	62	12	176	65	86	159	39	53	3661
Grass under 5 years old	66	42	46	13	136	41	64	91	17	30	198
Grass 5 years and over	54	28	27	10	107	33	37	57	9	10	516
All grass	56	31	31	10	114	35	45	64	11	14	714
All crops and grass	85	55	57	12	169	62	82	144	34	47	4375

Source: British Survey of Fertiliser Practice 2005

Table SC1.1 Total fertiliser use, Scotland 2005

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	100	52	65	7	156	65	94	156	33	61	13
Winter wheat	99	84	84	6	181	64	78	179	53	66	141
Spring barley	99	95	96	37	103	55	65	102	53	63	294
Winter barley	98	88	91	10	185	73	76	181	64	69	73
Oats	93	65	84	7	103	55	56	96	36	47	41
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Seed potatoes	84	84	84	63	155	196	202	130	165	170	9
Early potatoes	-	-	-	-	-	-	-	-	-	-	2
2nd Early/Maincrop potatoes	100	100	100	20	137	178	227	137	178	227	12
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	87	83	7	221	78	69	221	68	57	52
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	98	100	100	67	76	110	100	75	110	100	35
Leafy forage crops	49	49	49	30	87	55	75	42	27	37	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	24	100	100	6	10	34	34	2	34	34	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	48	48	56	6	44	86	107	21	41	60	8
Soft fruit	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	4
All tillage	97	88	90	24	138	65	73	134	57	66	715
Grass under 5 years old	92	81	80	32	107	32	41	98	26	33	307
Grass 5 years and over	79	72	66	30	96	28	32	76	20	21	340
All grass	84	75	71	31	101	30	36	84	22	26	647
All crops and grass	88	80	78	28	116	44	51	102	35	40	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.2 Use of straight fertiliser, Scotland 2005

	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	93	0	13	145	0	85	134	0	11	13
Winter wheat	96	2	7	163	53	121	157	1	9	141
Spring barley	61	0	2	70	38	88	43	0	2	294
Winter barley	94	0	9	167	0	104	157	0	10	73
Oats	54	0	9	105	0	77	56	0	7	41
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	2
Seed potatoes	8	0	8	213	0	150	17	0	12	9
Early potatoes	-	-	-	-	-	-	-	-	-	2
2nd Early/Maincrop potatoes	20	13	0	63	28	0	13	4	0	12
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	92	8	3	191	85	84	176	6	3	52
Linseed	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	0	0	0	0	0	0	0	0	0	35
Leafy forage crops	5	0	7	43	0	75	2	0	5	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	0	0	0	0	0	0	0	0	0	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	0	0	8	0	0	90	0	0	7	8
Soft fruit	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	4
All tillage	71	1	5	125	64	101	88	1	5	715
Grass under 5 years old	21	1	1	93	76	147	20	1	1	307
Grass 5 years and over	21	1	0	85	71	120	18	1	0	340
All grass	21	1	1	88	72	134	19	1	1	647
All crops and grass	39	1	2	112	68	106	44	1	2	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.3 Use of compound fertiliser, Scotland 2005

	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	51	52	62	42	65	80	22	33	50	13
Winter wheat	43	82	78	51	64	73	22	52	57	141
Spring barley	95	95	95	63	55	64	59	52	61	294
Winter barley	54	88	81	44	73	72	24	64	59	73
Oats	69	65	75	57	55	54	39	36	40	41
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	2
Seed potatoes	84	84	76	134	196	208	113	165	158	9
Early potatoes	-	-	-	-	-	-	-	-	-	2
2nd Early/Maincrop potatoes	100	100	100	124	174	227	124	174	227	12
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	78	87	80	57	70	68	44	61	54	52
Linseed	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	98	100	100	76	110	100	75	110	100	35
Leafy forage crops	49	49	49	82	55	64	40	27	31	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	24	100	100	10	34	34	2	34	34	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	48	48	48	44	86	109	21	41	53	8
Soft fruit	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	4
All tillage	75	87	86	61	64	71	46	56	61	715
Grass under 5 years old	81	80	79	97	32	40	79	26	32	307
Grass 5 years and over	67	72	66	86	27	32	58	19	21	340
All grass	72	75	71	91	29	35	66	22	25	647
All crops and grass	73	79	76	80	43	50	58	34	38	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.4 Use of lime, Scotland 2005

	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	-	-	-	-	-	-	-	-	-	-	-	-	0	13
Winter wheat	3.3	-	6.7	-	0.8	10.9	4.8	-	4.8	-	4.9	4.9	12	141
Spring barley	10.2	-	6.3	-	2.0	18.1	4.3	-	4.1	-	3.4	4.2	58	294
Winter barley	3.7	-	0.8	-	-	4.4	4.5	-	4.9	-	-	4.6	5	73
Oats	9.3	-	5.0	-	-	14.3	3.7	-	3.7	-	-	3.7	6	41
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	9
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	2
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	12
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Winter oilseed rape	1.9	-	5.7	-	-	7.6	3.7	-	2.1	-	-	2.5	6	52
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	1	3
Rootcrops for stockfeed	5.3	-	8.3	-	-	13.6	4.9	-	4.6	-	-	4.8	5	35
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	1	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	2
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	1
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	0	4
All tillage	6.7	-	5.3	-	1.2	13.1	4.3	-	4.1	-	3.5	4.2	96	715
Grass under 5 years old	0.7	-	1.1	-	1.3	3.1	4.9	-	4.8	-	2.3	4.3	15	307
Grass 5 years and over	0.5	-	0.2	-	0.3	1.1	2.5	-	4.1	-	1.4	2.4	7	340
All grass	0.6	-	0.5	-	0.7	1.8	3.5	-	4.6	-	2.0	3.6	22	647
All crops and grass	2.8	-	2.3	-	0.9	5.9	4.2	-	4.2	-	2.7	4.1	118	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.5 Percentage of crop area by field application rate - N, Scotland 2005

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	0	0	7	0	0	0	4	69	20	-	-	-	-	-	-	-	-	-	12
Winter wheat	1	6	1	2	9	2	4	6	26	29	5	1	3	4	0	2	-	-	13
Spring barley	1	0	4	12	21	39	16	5	0	1	-	-	-	-	-	-	-	-	141
Winter barley	2	0	0	3	2	5	18	12	20	26	2	5	0	1	4	-	-	-	294
Oats	7	0	10	8	24	32	1	15	0	2	-	-	-	-	-	-	-	-	73
Rye/Triticale/Durum wheat	0	0	0	0	0	50	50	-	-	-	-	-	-	-	-	-	-	-	41
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Early potatoes	83	0	0	0	0	0	0	0	0	0	17	-	-	-	-	-	-	-	9
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	0	0	0	2	3	1	2	3	13	25	22	26	0	3	-	-	-	-	52
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	2	0	7	21	64	3	3	-	-	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	51	0	0	20	7	16	5	-	-	-	-	-	-	-	-	-	-	-	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	76	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	52	21	0	18	9	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
All tillage	3	2	3	8	15	22	11	7	9	11	3	3	1	1	-	-	-	-	715
Grass under 5 years old	8	1	12	24	13	11	8	7	5	6	2	2	1	1	-	-	-	-	307
Grass 5 years and over	21	1	15	24	7	9	10	4	4	2	0	1	1	-	-	-	-	-	340
All grass	16	1	14	24	10	10	9	5	5	3	1	1	1	-	-	-	-	-	647
All crops and grass	12	2	10	18	11	14	10	6	6	6	2	2	1	1	-	-	-	-	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.6 Percentage of crop area by field application rate - P_2O_5, Scotland 2005

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	48	0	2	37	13	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Winter wheat	16	11	11	29	25	5	2	-	-	-	-	-	-	-	-	-	-	-	13
Spring barley	5	4	23	56	9	3	-	-	-	-	-	-	-	-	-	-	-	-	141
Winter barley	12	2	7	21	54	4	-	-	-	-	-	-	-	-	-	-	-	-	294
Oats	35	5	16	34	11	-	-	-	-	-	-	-	-	-	-	-	-	-	73
Rye/Triticale/Durum wheat	0	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Early potatoes	83	0	0	0	0	17	-	-	-	-	-	-	-	-	-	-	-	-	9
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	13	2	7	44	24	5	-	-	-	-	-	-	-	-	-	-	-	-	52
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	0	0	0	1	45	19	15	19	-	-	-	-	-	-	-	-	-	-	35
Leafy forage crops	51	0	9	32	7	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	52	0	24	0	0	15	0	2	7	-	-	-	-	-	-	-	-	-	8
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
All tillage	12	5	16	41	19	4	1	1	-	-	-	-	-	-	-	-	-	-	715
Grass under 5 years old	19	29	36	12	2	1	-	-	-	-	-	-	-	-	-	-	-	-	307
Grass 5 years and over	28	36	26	5	4	1	-	-	-	-	-	-	-	-	-	-	-	-	340
All grass	25	34	30	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	647
All crops and grass	20	23	25	20	9	2	1	-	-	-	-	-	-	-	-	-	-	-	1362

Source: British Survey of Fertiliser Practice 2005

Table SC1.7 Percentage of crop area by field application rate - K_2O, Scotland 2005

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	0	7	7	23	17	0	11	-	-	-	-	-	-	-	-	-	-	12
Winter wheat	16	11	6	19	24	14	3	5	0	0	0	1	-	-	-	-	-	-	13
Spring barley	4	3	20	37	28	8	-	-	-	-	-	-	-	-	-	-	-	-	141
Winter barley	9	2	15	14	43	14	1	2	-	-	-	-	-	-	-	-	-	-	294
Oats	16	16	17	22	28	1	-	-	-	-	-	-	-	-	-	-	-	-	73
Rye/Triticale/Durum wheat	0	0	0	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Early potatoes	83	0	0	0	0	0	0	17	-	-	-	-	-	-	-	-	-	-	9
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	17	2	16	33	22	6	0	4	-	-	-	-	-	-	-	-	-	-	52
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Rootcrops for stockfeed	0	0	1	8	48	16	18	7	0	2	-	-	-	-	-	-	-	-	35
Leafy forage crops	51	0	9	20	7	5	0	7	-	-	-	-	-	-	-	-	-	-	12
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	44	0	0	24	15	6	0	2	0	0	0	9	-	-	-	-	-	-	8
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
All tillage	10	5	15	28	27	10	1	2	-	-	-	-	-	-	-	-	-	-	715
Grass under 5 years old	20	28	28	12	6	3	2	1	-	-	-	-	-	-	-	-	-	-	307
Grass 5 years and over	34	32	22	4	4	1	2	-	-	-	-	-	-	-	-	-	-	-	340
All grass	29	31	24	7	5	2	2	1	-	-	-	-	-	-	-	-	-	-	647
All crops and grass	22	21	21	15	13	5	1	1	-	-	-	-	-	-	-	-	-	-	1362

Source: British Survey of Fertiliser Practice 2005

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2005

	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	70	64	20	79	23	24	62	16	15	342
Grazed mown	94	87	89	57	143	40	52	135	35	46	215
All grazings	83	75	70	30	98	28	33	81	21	23	557
Cut for silage - grazed	97	91	92	60	146	40	54	142	36	49	176
Cut for silage - not grazed	100	90	88	56	131	46	62	131	42	55	66
All cut for silage	98	91	91	59	143	42	55	139	38	51	242
Cut for hay - grazed	82	72	70	47	109	30	35	89	21	25	48
Cut for hay - not grazed	86	71	67	9	110	45	55	95	32	37	22
All cut for hay	83	72	70	37	109	34	40	91	24	28	70
All mowings	95	88	88	55	139	41	54	133	36	48	299
All grass	84	75	71	31	101	30	36	84	22	26	647

Source: British Survey of Fertiliser Practice 2005

Table SC2.2 Percentage of grass area by field application rate - N, Scotland 2005

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	19	30	7	8	7	1	2	1	0	0	1	-	-	-	-	-	342
Grazed mown	6	1	4	10	15	9	14	12	11	9	3	3	3	2	-	-	-	-	215
All grazings	17	2	15	25	9	9	8	4	5	3	1	1	1	1	-	-	-	-	66
Cut for silage - grazed	3	1	4	8	14	10	15	12	12	9	4	3	3	2	-	-	-	-	557
Cut for silage - not grazed	0	0	5	9	11	25	13	16	6	8	0	5	-	-	-	-	-	-	176
All cut for silage	2	1	4	8	13	14	15	13	11	9	3	3	2	2	-	-	-	-	22
Cut for hay - grazed	18	8	2	20	24	0	3	12	2	7	0	3	-	-	-	-	-	-	242
Cut for hay - not grazed	14	0	0	14	21	15	19	17	-	-	-	-	-	-	-	-	-	-	48
All cut for hay	17	6	1	19	23	4	7	13	2	5	0	2	-	-	-	-	-	-	70
All mowings	5	1	4	10	14	12	14	13	9	8	2	3	2	2	-	-	-	-	299
All grass	16	1	14	24	10	10	9	5	5	3	1	1	1	-	-	-	-	-	647

Source: British Survey of Fertiliser Practice 2005

Table SC2.3 Percentage of grass area by field application rate - P_2O_5, Scotland 2005

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	30	40	26	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	342
Grazed mown	13	21	40	20	4	2	-	-	-	-	-	-	-	-	-	-	-	-	215
All grazings	25	35	30	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	66
Cut for silage - grazed	9	22	40	22	4	2	1	-	-	-	-	-	-	-	-	-	-	-	557
Cut for silage - not grazed	10	23	32	17	13	6	-	-	-	-	-	-	-	-	-	-	-	-	176
All cut for silage	9	22	38	21	6	3	-	-	-	-	-	-	-	-	-	-	-	-	22
Cut for hay - grazed	28	30	29	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	242
Cut for hay - not grazed	29	9	45	5	7	5	-	-	-	-	-	-	-	-	-	-	-	-	48
All cut for hay	28	25	33	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	70
All mowings	12	21	38	19	6	3	-	-	-	-	-	-	-	-	-	-	-	-	299
All grass	25	34	30	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	647

Source: British Survey of Fertiliser Practice 2005

Table SC2.4 Percentage of grass area by field application rate - K_2O, Scotland 2005

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	36	36	23	2	1	0	1	-	-	-	-	-	-	-	-	-	-	-	342
Grazed mown	11	20	29	18	10	6	3	2	-	-	-	-	-	-	-	-	-	-	215
All grazings	30	32	25	6	3	2	2	-	-	-	-	-	-	-	-	-	-	-	66
Cut for silage - grazed	8	21	29	18	11	6	4	2	-	-	-	-	-	-	-	-	-	-	557
Cut for silage - not grazed	12	17	15	20	24	8	3	1	-	-	-	-	-	-	-	-	-	-	176
All cut for silage	9	20	25	19	14	7	4	2	-	-	-	-	-	-	-	-	-	-	22
Cut for hay - grazed	30	29	22	15	5	-	-	-	-	-	-	-	-	-	-	-	-	-	242
Cut for hay - not grazed	33	5	35	13	9	0	0	5	-	-	-	-	-	-	-	-	-	-	48
All cut for hay	30	22	25	14	6	0	0	1	-	-	-	-	-	-	-	-	-	-	70
All mowings	12	19	26	18	13	6	3	2	-	-	-	-	-	-	-	-	-	-	299
All grass	29	31	24	7	5	2	2	1	-	-	-	-	-	-	-	-	-	-	647

Source: British Survey of Fertiliser Practice 2005

Table SC3.0 Product and nutrient use by month of application, Scotland 2005

(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	2	21	47	21	5	1	1	206
Straight P	13	0	0	0	0	29	48	3	3	1	0	4	2
Straight K	6	0	0	0	0	26	31	18	18	0	0	2	5
Compounds	3	4	0	0	0	1	17	46	12	8	5	2	474
All Fertilisers	2	3	0	0	0	2	19	46	15	7	4	2	687

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient ('000 tonnes)
N	1	1	0	0	0	1	18	49	16	8	4	2	157
P_2O_5	7	7	1	1	1	3	22	39	10	4	3	2	54
K_2O	5	7	1	1	1	4	20	39	11	6	3	2	62
Total	3	3	0	0	0	2	19	45	14	7	4	2	272

Note: 'Product 'refers to the total tonnage of the products used by farmers in the survey year 2005;
'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 2005

Table SC3.1 Product type as percentage of all product used by crop group, Scotland 2005

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	0.9	0.1	0.0	0.0	0.0	0.0	0.4	0.1	0	0.2	0.0	0.1	0.3
Urea	1.2	4.2	0.0	0.0	9.5	0.0	3.2	1.2	0	0.9	0.0	1.1	2.2
Ammonium Nitrate	5	49.3	3.6	0.0	43.0	0.4	33.0	12.1	21	10.1	0.0	11.7	22.6
UAN	2.3	2.7	0.0	0.0	4.8	0.0	2.6	0.6	0	0.3	0.0	0.5	1.6
Other Straight N	2.6	3.8	0.0	0.0	3.6	0.0	3.0	0.4	0	0.3	0.0	0.4	1.7
Triple Superphosphate	0.0	0.3	0.4	0.0	1.6	0.0	0.3	0.4	0	0.2	0.0	0.4	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
Other Straight P	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
Muriate of Potash	0.9	1.9	0.7	0.0	0.5	1.1	1.2	0.4	0	0.3	0.0	0.3	0.8
Other Straight K	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
NP	2.2	2.8	2.6	0.0	6.4	0.0	2.8	7.1	5	4.8	0.0	7.2	5.0
NK	2.4	0.9	0.0	0.0	3.6	0.4	1.8	3.0	1	4.2	0.0	3.1	2.4
PK	1.4	14.3	0.0	0.0	2.8	5.0	6.6	2.5	4	2.4	0.0	2.5	4.6
Very High N	6.5	3.2	0.0	0.0	1.0	1.2	4.2	45.6	43	42.9	0.0	44.9	24.1
High N	1	2.8	4.8	0.0	0.9	7.1	8.5	22.2	19	28.7	100.0	23.2	15.7
High P	0.0	2.1	4.9	0.0	2.9	19.9	1.9	0.5	0	0.5	0.0	0.4	1.2
High K	1	2.4	53.8	0.0	0.5	23.1	11.2	0.5	0	0.5	0.0	0.5	5.9
Low N	7	7.3	27.1	0.0	11.5	29.8	10.7	0.5	0	0.9	0.0	0.7	5.8
Low P	1.9	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0	1.5	0.0	0.8	0.8
Equal NPK	4	1.9	2.1	0.0	7.3	12.0	7.8	2.3	5	1.2	0.0	2.2	5.0
Total Product ('000 tonnes)	**151**	**136**	**14**	**0**	**40**	**9**	**350**	**296**	**19**	**160**	**1**	**337**	**687**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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.

Figures revised 1/09/06

Source: British Survey of Fertiliser Practice 2005

Table SC3.2 Use of product type by crop group, Scotland 2005

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	88.2	11.8	0.0	0.0	0.0	0.0	83.8	100.0	0.0	100.0	0.0	16.2	2
Urea	16.3	50.1	0.0	0.0	33.6	0.0	75.0	94.1	0.0	37.5	0.0	25.0	15
Ammonium Nitrate	26.8	57.9	0.4	0.0	14.8	0.0	74.5	91.0	9.8	40.7	0.0	25.5	155
UAN	38.2	40.7	0.0	0.0	21.1	0.0	84.3	100.0	0.0	28.5	0.0	15.7	11
Other Straight N	36.9	49.4	0.0	0.0	13.7	0.0	89.6	100.0	0.0	38.5	0.0	10.4	12
Triple Superphosphate	0.0	34.0	5.7	0.0	60.3	0.0	44.6	100.0	5.5	21.7	0.0	55.4	2
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	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	32.0	58.8	2.3	0.0	4.5	2.4	79.5	100.0	0.0	44.1	0.0	20.5	5
Other Straight K	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
NP	32.8	38.2	3.6	0.0	25.4	0.0	29.0	86.4	4.2	31.6	0.0	71.0	34
NK	57.1	19.2	0.0	0.0	23.0	0.7	37.8	85.3	2.1	65.6	0.0	62.2	17
PK	8.9	84.2	0.0	0.0	4.9	2.0	73.4	89.8	9.4	45.9	0.0	26.6	31
Very High N	66.9	29.5	0.0	0.0	2.8	0.8	8.8	89.3	5.4	45.3	0.0	91.2	166
High N	81.7	12.5	2.3	0.0	1.2	2.3	27.6	84.3	4.6	58.6	0.9	72.4	108
High P	0.0	43.4	10.5	0.0	17.4	28.7	82.5	100.0	0.0	62.4	0.0	17.5	8
High K	66.0	8.3	19.5	0.0	0.5	5.6	95.8	78.7	4.0	49.8	0.0	4.2	41
Low N	43.3	26.7	10.3	0.0	12.2	7.6	93.8	59.6	1.6	60.9	0.0	6.2	40
Low P	100.0	0.0	0.0	0.0	0.0	0.0	53.5	64.7	0.0	96.8	0.0	46.5	5
Equal NPK	74.4	9.6	1.1	0.0	10.7	4.2	78.5	90.8	12.9	25.2	0.0	21.5	35
All Fertilisers	**43**	**39**	**4**	**0**	**11**	**3**	**51**	**88**	**6**	**47**	**0**	**49**	**687**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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.

Figures revised 1/09/06

Source: British Survey of Fertiliser Practice 2005

Table SC3.3 Product use by month of application, Scotland 2005

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Calcium Ammonium Nitrate	0.0	0.0	0.0	25.6	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
Urea	0.0	1.4	14.2	66.7	3.6	9.3	3.1	0.0	0.0	0.0	1.7	0.0	15
Ammonium Nitrate	0.0	2.4	20.0	46.8	21.1	5.1	1.4	1.1	1.3	0.1	0.5	0.2	155
UAN	0.0	0.0	18.2	46.1	31.8	1.8	0.0	0.0	2.0	0.0	0.0	0.0	11
Other Straight N	0.0	0.0	28.2	45.3	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
Triple Superphosphate	0.0	28.6	47.8	2.5	3.0	1.2	0.0	3.8	13.0	0.0	0.0	0.0	2
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	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	0.0	26.0	30.7	18.1	17.6	0.4	0.0	1.6	5.5	0.0	0.0	0.0	5
Other Straight K	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
NP	0.0	0.2	41.4	37.7	12.5	2.7	0.2	0.0	4.0	1.2	0.0	0.0	34
NK	0.0	0.0	8.6	47.2	16.1	18.3	8.6	0.0	1.0	0.1	0.1	0.0	17
PK	5.9	11.7	11.0	4.8	3.2	0.3	3.8	0.0	18.0	31.4	4.4	5.3	31
Very High N	0.0	0.0	11.2	48.4	14.9	14.6	7.4	3.4	0.2	0.0	0.0	0.0	166
High N	0.0	0.0	12.3	61.9	12.5	7.9	4.3	0.6	0.0	0.6	0.0	0.0	108
High P	0.0	2.6	0.9	15.3	21.3	1.5	10.9	6.5	16.6	24.4	0.0	0.0	8
High K	0.0	0.0	31.3	44.1	17.6	2.3	0.0	0.3	0.0	4.4	0.0	0.0	41
Low N	0.0	6.0	31.8	30.8	7.5	1.3	0.6	7.2	7.1	7.0	0.6	0.0	40
Low P	0.0	0.0	0.0	56.2	11.1	15.4	14.8	0.0	2.5	0.0	0.0	0.0	5
Equal NPK	0.0	0.0	29.6	50.0	6.2	2.1	2.7	0.6	6.9	1.8	0.0	0.0	35
All Fertilisers	**0**	**2**	**19**	**46**	**15**	**7**	**4**	**2**	**2**	**3**	**0**	**0**	**687**

N.B: Precise estimates of quantities by product type cannot be derived from the date 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.

Figures revised 1/09/06

Source: British Survey of Fertiliser Practice 2005

Table SC4.1 Average fertiliser practice, North East Scotland 2005

	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	9	182	68	69	182	68	69	17
Spring barley	100	97	100	50	101	56	64	101	54	64	123
Winter barley	100	100	100	8	176	76	67	176	76	67	28
Oats	100	100	100	36	68	44	44	68	44	44	6
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	4
Early potatoes	-	-	-	-	-	-	-	-	-	-	1
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	100	100	13	202	70	61	202	70	61	21
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	80	79	117	98	79	117	98	18
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	3
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	98	96	98	38	125	65	67	123	63	66	228
Grass under 5 years old	94	86	80	27	119	32	42	112	28	33	99
Grass 5 years and over	92	91	78	12	102	24	28	94	22	22	58
All grass	93	88	79	20	111	28	35	104	25	28	157
All crops and grass	96	92	88	29	118	47	53	113	43	46	385

Source: British Survey of Fertiliser Practice 2005

Table SC4.2 Average fertiliser practice, South East Scotland 2005

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	100	44	59	0	166	60	95	166	26	56	11
Winter wheat	100	82	82	4	180	63	79	180	51	64	115
Spring barley	98	91	92	13	108	54	67	107	50	62	133
Winter barley	100	77	83	3	192	70	86	192	54	71	39
Oats	90	64	76	3	119	58	66	106	37	51	28
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	75	75	75	70	148	148	210	112	112	158	5
Early potatoes	-	-	-	-	-	-	-	-	-	-	1
2nd Early/Maincrop potatoes	100	100	100	24	140	182	233	140	182	233	10
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	78	71	4	229	84	74	229	65	53	28
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	35	73	101	103	73	101	103	14
Leafy forage crops	35	35	35	26	76	58	61	26	20	21	7
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	24	100	100	6	10	34	34	2	34	34	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	4
Soft fruit	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	3
All tillage	96	82	83	9	150	65	78	144	53	65	410
Grass under 5 years old	86	68	68	17	89	31	38	77	21	25	119
Grass 5 years and over	57	47	36	5	74	28	30	42	13	11	119
All grass	69	55	49	10	81	29	34	56	16	17	238
All crops and grass	83	69	66	9	122	51	62	101	35	41	648

Source: British Survey of Fertiliser Practice 2005

Table SC4.3 Average fertiliser practice, South West Scotland 2005

	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	70	100	100	61	108	50	63	76	50	63	6
Spring barley	100	100	100	79	85	53	57	85	53	57	25
Winter barley	55	100	100	73	162	69	80	89	69	80	5
Oats	-	-	-	-	-	-	-	-	-	-	2
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	3
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	89	100	100	73	97	56	62	87	56	62	49
Grass under 5 years old	92	86	87	56	124	36	46	114	31	40	66
Grass 5 years and over	89	83	81	50	107	30	35	96	25	29	145
All grass	90	84	83	52	112	32	38	100	27	32	211
All crops and grass	90	85	84	53	111	34	40	99	29	34	260

Source: British Survey of Fertiliser Practice 2005

Table SC5.1 Average fertiliser practice on general cropping farms, Scotland 2005

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	100	46	58	0	166	64	96	166	29	56	9
Winter wheat	100	86	85	3	180	62	76	180	53	64	107
Spring barley	99	92	95	23	112	57	69	111	53	65	150
Winter barley	100	84	88	4	195	71	77	195	60	68	50
Oats	91	54	79	7	108	52	54	98	28	43	27
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	84	84	84	63	155	196	202	130	165	170	9
Early potatoes	-	-	-	-	-	-	-	-	-	-	2
2nd Early/Maincrop potatoes	100	100	100	29	135	161	199	135	161	199	9
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	86	82	6	220	79	69	220	68	57	49
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	38	67	114	105	67	114	105	8
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	24	100	100	6	10	34	34	2	34	34	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	43	43	52	0	39	86	109	17	37	57	6
Soft fruit	-	-	-	-	-	-	-	-	-	-	1
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	97	84	87	13	151	66	75	146	55	65	442
Grass under 5 years old	81	76	73	5	107	36	46	87	27	33	77
Grass 5 years and over	53	43	39	5	103	30	38	55	13	15	71
All grass	65	56	53	5	106	33	42	69	19	22	148
All crops and grass	89	77	78	11	142	60	69	126	46	54	590

Source: British Survey of Fertiliser Practice 2005

Table SC5.2 Average fertiliser practice on dairy farms, Scotland 2005

	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	-	-	-	-	-	-	-	-	-	-	4
Spring barley	100	100	100	73	86	59	65	86	59	65	15
Winter barley	-	-	-	-	-	-	-	-	-	-	2
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	-	-	-	-	-	-	-	-	-	-	2
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	2
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
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	-	-	-	-	-	-	-	-	-	-	0
All tillage	80	95	95	77	85	59	63	67	56	60	30
Grass under 5 years old	100	93	92	70	158	38	60	158	35	55	33
Grass 5 years and over	96	91	94	63	142	29	34	137	26	32	52
All grass	97	91	93	65	147	31	42	143	29	39	85
All crops and grass	95	92	93	67	141	35	45	134	32	42	115

Source: British Survey of Fertiliser Practice 2005

Table SC5.3 Average fertiliser practice on mixed farms, Scotland 2005

	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	67	75	10	198	86	105	198	57	79	29
Spring barley	100	98	99	51	92	54	64	92	53	63	66
Winter barley	100	95	95	12	166	78	74	166	74	70	16
Oats	100	100	100	6	117	71	75	117	71	75	8
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	3
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	66	81	126	96	81	126	96	13
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	-	-	-	-	-	-	-	-	-	-	2
All tillage	100	94	96	37	122	68	76	122	63	73	146
Grass under 5 years old	89	74	72	22	106	32	36	94	24	26	69
Grass 5 years and over	78	70	61	22	106	36	43	83	25	26	71
All grass	83	72	67	22	106	34	39	88	24	26	140
All crops and grass	89	80	77	27	113	48	56	101	39	43	286

Source: British Survey of Fertiliser Practice 2005

Table SC5.4 Average fertiliser practice in Less Favoured Areas, Scotland 2005

	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	-	-	-	-	-	-	-	-	-	-	1
Spring barley	100	100	100	69	82	48	54	82	48	54	63
Winter barley	100	100	100	65	128	82	76	128	82	76	5
Oats	-	-	-	-	-	-	-	-	-	-	4
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	100	100	100	80	78	96	99	78	96	99	12
Leafy forage crops	83	83	83	26	82	56	81	68	47	67	7
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	99	99	99	65	81	53	59	81	53	59	97
Grass under 5 years old	80	74	66	29	78	26	28	62	19	19	146
Grass 5 years and over	94	82	83	37	96	30	37	90	25	31	128
All grass	85	77	72	32	85	27	32	72	21	23	274
All crops and grass	86	79	74	34	84	30	34	72	23	25	371

Source: British Survey of Fertiliser Practice 2005

SECTION D

SUPPLEMENTARY SURVEY ANALYSIS ON THE USE OF ORGANIC MANURES – GREAT BRITAIN, 2005

Introduction

General and supplementary information is collected for each farm holding that is surveyed. The supplementary questions vary each year. 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 blood from abattoirs. Of the 1331 farmers in the survey, 892 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, 2005

manure type	*none*	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*other*
Number	439	737	255	29	20	41	30	5	38	46
%	33	55	19	2	2	3	2	0	3	3

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

Of the 439 farmers who did not spread manure, five had had livestock manure, 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 2005

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	4	2	0	0	1	1	0	29
Amount exported (tonnes or m^3)	10630	32258	8200	0	0	400	45	0	51533
Average per farm (tonnes or m^3)	506	8064	4100	0	0	400	45	0	1777

Note: some farmers exported more than one type of manure.

This indicates that only 29 (2%) of the farmers surveyed exported manures and that cattle FYM is exported most often. Data on manure types other than cattle FYM should be treated with caution due to the small numbers in the sample.

Of the 892 farmers who used manure, 152 had imported some/all of it; the details are given in Table D1.3. Of the 152 importing manure, 17 imported more than one type and 5 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 2005

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	30	2	10	3	2	21	29	1	98
Amount imported (tonnes or m^3)	24615	681	6600	2990	600	6039	10665	3000	55190
Average per farm (tonnes or m^3)	821	341	660	997	300	288	368	3000	563

Table D1.3b Number of farmers importing non-farm manures (solids and liquids), showing quantity imported, Great Britain 2005

manure type	*sewage sludge*				*composted green manure*	*other*	*total*
	digested liquid	*digested cake*	*thermally dried*	*lime stabilised*			
No. of farms importing manure type	1	21	2	9	4	17	54
Amount imported (tonnes or m^3)	151	36843	670	11313	6450	12630	68057
Average per farm (tonnes or m^3)	151	1754	335	1257	1613	743	1260

Note: some farmers imported more than one type of manure.

The amount of non-farm manures was much larger in 2004 compared with 2003, mainly due to increases in digested cake and lime stabilised sewage sludges. There was a further increase in 2005 mainly in the form of digested cake. Cattle FYM and poultry manure continued to be the farm produced manures most likely to be imported, but there were increases in all types and the amount of imported farm manures has nearly doubled compared with 2004.

For liquid organic manure applications during the current season the most common method of application is broadcasting (Table D1.4). Looking specifically at cattle and pig slurry applications, bandspreading and shallow injection are more likely to be used for pig slurry than cattle 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, 2005

robust farm type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
England & Wales							
1 Cereals	10	100.0	0.0	0.0	0.0	0.0	0.0
2 General cropping	5	92.0	8.0	0.0	0.0	0.0	0.0
4 Pigs and poultry	2	62.5	37.5	0.0	0.0	0.0	0.0
5 Dairy	118	88.4	7.7	0.7	0.1	1.6	1.5
6 Cattle and sheep	58	95.0	3.2	0.0	0.0	0.1	1.7
7 Sheep and cattle (lowland)	46	93.5	6.0	0.0	0.0	0.5	0.0
8 Mixed	29	86.8	3.8	2.4	0.0	0.0	7.0
Scotland							
1 Cereals	5	100.0	0.0	0.0	0.0	0.0	0.0
2 General cropping	3	100.0	0.0	0.0	0.0	0.0	0.0
5 Dairy	19	98.7	1.3	0.0	0.0	0.0	0.0
6 Cattle and sheep	32	96.9	0.0	0.0	0.0	3.1	0.0
7 Sheep and cattle (lowland)	4	100.0	0.0	0.0	0.0	0.0	0.0
8 Mixed	9	100.0	0.0	0.0	0.0	0.0	0.0

Table D1.4b Number and percentage (%) of farms using each type of application method where pig slurry was applied, by country and robust type, 2005

robust farm type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
England & Wales							
1 Cereals	6	83.3	16.7	0.0	0.0	0.0	0.0
2 General cropping	4	100.0	0.0	0.0	0.0	0.0	0.0
3 Horticulture	2	62.5	37.5	0.0	0.0	0.0	0.0
4 Pigs and poultry	1	100.0	0.0	0.0	0.0	0.0	0.0
5 Dairy	1	100.0	0.0	0.0	0.0	0.0	0.0
6 Cattle and sheep	2	100.0	0.0	0.0	0.0	0.0	0.0
8 Mixed	4	50.0	30.0	20.0	0.0	0.0	0.0
Scotland							
1 Cereals	1	100.0	0.0	0.0	0.0	0.0	0.0
2 General cropping	1	100.0	0.0	0.0	0.0	0.0	0.0

Table D1.5 Number and percentage (%) of farms using each type of application method, by slurry type for Great Britain, 2005

slurry type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry	340	92.4	4.7	0.4	0.0	1.0	1.4
Pig slurry	22	84.1	12.4	3.5	0.0	0.0	0.0
Both	20	94.8	5.2	0.0	0.0	0.0	0.0
Total	**382**	**92.1**	**5.2**	**0.6**	**0.0**	**0.9**	**1.2**

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 a fifth of fields receiving manures get more than one application and 82% of the multiple applications are made to grass and forage maize. Table D1.6 shows the best estimate of incorporation using information recorded for the current season. Farmers with poultry manure are most likely to incorporate at least some of it (possibly because of the restriction imposed on poultry manure applications in some areas). This equates to nearly 60% of the area receiving poultry manure. Conversely cattle slurry (which tends to be applied to grassland) is least likely to be incorporated. Details about how quickly manures were incorporated (Table D1.7) shows that over 50% of poultry manure is incorporated within 24 hours, whilst only 15% of FYM, 23% of cattle slurry and 14% of pig slurry is incorporated this quickly.

Table D1.6 Degree of incorporation of organic manures/slurries applied in current season, Great Britain 2005

manure type	*% farms where a proportion of manure/slurry type is incorporated*	*% of manure type incorporated* [a]	*% area of incorporated manure/slurry* [b]
FYM	56	39	25
Poultry manure	71	58	58
Cattle slurry	32	21	15
Pig slurry	65	66	52

Table D1.7 Frequency of incorporation time by manure/slurry type, Great Britain 2005

manure type	*percentage of farms incorporation time*			
	</= 6 hours	*6-24 hours*	*1 day - 1 week*	*> 1 week*
FYM	1.1	14.0	61.4	23.5
Poultry manure	5.9	56.9	31.3	5.9
Cattle slurry	2.9	20.3	50.9	25.9
Pig slurry	6.9	7.5	45.6	40.0
Other slurry	0.0	38.0	29.3	32.6

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 30% of the total poultry manure applications. Farmers with FYM were least likely use a contractor, although the area spread by contractors represents about 20% of the total area receiving FYM.

Table D1.8 Use of contractors to spread manure/slurry in current season, Great Britain 2005

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	34	19	21
Poultry manure	51	29	32
Cattle slurry	40	27	26
Pig slurry	40	17	12

[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 10297 fields belonging to farms who used manures, 2394 fields (28%) 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 2005

	1 year	*2 years*	*3 years*	*4 years*	*5 years*	*6 years*	*>6 years*	*never*	*don't know*
% of fields	15	6	6	7	9	4	17	28	8

For the 2634 fields that received organic manures in the 2004/05 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 2005

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler / turkey manure*	*duck manure*	*other*
%	54	31	1	2	2	2	3	1	3

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 2005

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

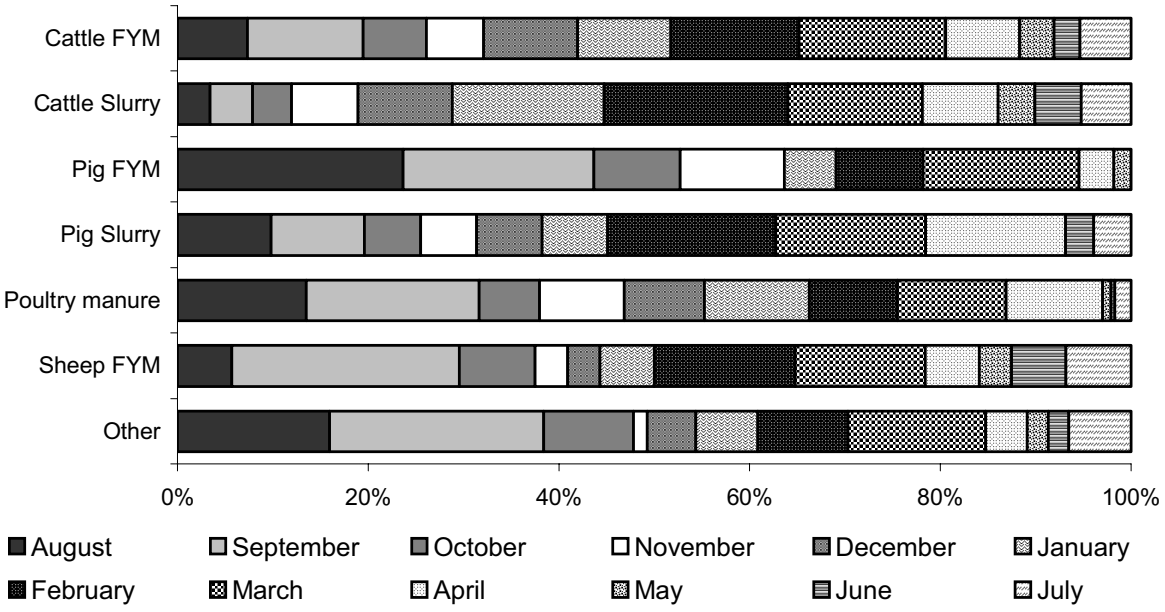
Table D2.4 **Number of applications of low, medium or high rates of each organic manure type, Great Britain 2005**

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep manure*	*layer manure*	*duck manure*	*broiler / turkey manure*	*other*	*total*
Low	829	741	13	40	51	17	19	45	49	1804
Medium	1151	463	23	44	34	68	10	54	65	1912
High	236	66	19	18	3	10	4	10	24	390
Total	2216	1270	55	102	88	95	33	109	138	4106

Over all manure types, over 40% of applications were described as low and nearly 50% as medium. Of the individual manure types, pig FYM and pig slurry were most likely to be applied at high rates (35% and 18% respectively).

The time of year when manure was applied is shown in Figure D2.1. Excluding cattle manures, most fields received manures in the autumn (August to October). For cattle 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, 2005**



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, 2005

	nitrogen		*phosphate*		*potash*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
Winter wheat	177	199	31	38	44	44
Spring barley	87	112	38	42	48	55
Winter barley	120	150	42	43	54	58
2nd early or maincrop potatoes	148	186	116	188	204	306
Sugar beet	88	101	23	46	77	135
Spring oilseed rape	158	149	25	24	41	34
Winter oilseed rape	180	209	27	44	31	44
Field peas (harvested dry)	7	4	18	44	45	49
Field beans (harvested dry)	0	5	49	44	74	67
Forage maize	58	89	42	64	62	128

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 15% (potash) for sugar beet and potatoes. There was little impact on dressing cover for nitrogen.

In terms of overall application rate there was a reduction in fertiliser applications where manures were used for most crops. The largest nitrogen reduction occurred with potatoes and forage maize (these were also the only crops where the number of fields receiving organic manures was greater than the number without). The largest reduction in phosphate and potash use occurred with potatoes. The number of field receiving manures was small for spring oilseed rape (10), peas (1) and beans (10) and these data should be treated with caution.

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). London: The Stationery Office.

Table D3.2 Average field rate of fertiliser application on grassland in England & Wales and in Scotland, with and without applications of organic manure, 2005

	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	196	235	34	28	66	54	120	52
Grass five years and over	145	136	31	32	45	37	300	172
All grass	155	156	32	31	49	40	420	224
Cattle and sheep								
Grass less than five years old	112	120	32	38	35	53	94	92
Grass five years and over	85	67	25	23	30	23	416	478
All grass	89	72	26	24	31	25	510	570
Other livestock								
Grass less than five years old	153	191	35	46	55	67	48	91
Grass five years and over	143	96	37	34	53	40	56	188
All grass	147	120	36	37	54	48	104	279
Scotland								
Dairy								
Grass less than five years old	166	140	42	28	69	42	21	12
Grass five years and over	159	115	34	20	43	21	37	15
All grass	162	121	37	22	52	26	58	27
Mixed								
Grass less than five years old	146	99	38	31	51	33	19	50
Grass five years and over	109	106	40	34	53	38	21	50
All grass	123	102	40	32	52	35	40	100

In England & Wales, 65% of all grass fields in the dairy sector had received manure. The difference in the average nitrogen fertiliser rate on dairy grassland with or without manure was relatively small, except on short term grass (less than five years old). On cattle and sheep farms, 47% of all grass fields received manure compared with 27% on mixed livestock farms. For both these farm types the average rate of nitrogen, phosphate and potash fertiliser was 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 manure than those on other farm types, with 68% of grass fields on dairy farms receiving manure compared with 29% 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 only cut for silage are most likely to receive manures, 75% and 89% respectively compared with 65% and 63% for grazed grass. In England & Wales, smaller dressings of mineral fertiliser were made to hay fields that received manure, but not for silage or grazed grass. In Scotland, only grazed grass had sufficient fields with or without manure for

comparison, and for grazed only grass the amount of mineral fertiliser 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, 2005

	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	89	120	24	54	37	45	33	15
All silage	165	148	33	30	57	51	225	75
All grazings	153	157	30	29	47	38	330	175
Scotland								
All hay	114	-	19	-	20	-	5	0
All silage	173	216	42	40	64	64	33	4
All grazings	163	119	33	22	46	24	44	26

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.

About a 40% of farmers check the accuracy of mineral fertiliser spreaders with catch trays on an annual basis (Table D4.1), with 4% checking at each change of fertiliser type. Sixty eight percent of farmers took active measures to prevent contamination of water courses, ditches and hedgerow bottoms when spreading mineral fertiliser.

Table D4.1 Frequency of spread pattern checks using a catch tray, Great Britain 2005

response	*percentage*
It is factory set and doesn't need checking	10
At each change of fertiliser type	4
Once a year	41
Less than once a year	11
Never checked	20
Other	10
Not answered	3

Farm diaries were the most common methods for recording both fertiliser and manure use (Table D4.2). No fertiliser records were kept on 10% of farms; this compares with 13% 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 2004-05 crop year in Great Britain

method	*applied fertiliser*		*applied organic manure*	
	number	*percentage*	*number*	*percentage*
Farm diary	475	39	281	32
Farm notebook	284	23	148	17
File record sheet	291	24	155	17
Computer program	334	27	141	16
Other paper record	48	4	15	2
No records kept	121	10	110	12
Not answered	1228	100	892	100
Total farms	475	39	281	32

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	2.7	2.9	1.5	0.8	1.0	2.7	2.6	4.7	1.1	1.4	2040
oilseed rape	3.6	3.8	1.9	1.1	1.2	3.8	3.4	4.3	1.4	1.7	588
winter barley	2.7	3.2	1.8	1.2	1.5	2.9	2.8	4.6	1.5	1.8	571
spring barley	1.6	2.7	1.8	0.9	1.1	1.7	2.6	1.7	1.3	1.6	732
m/c potatoes	8.7	6.9	15.2	9.2	15.8	12.1	9.9	18.0	15.4	26.3	170
sugar beet	3.3	4.1	2.4	2.1	5.6	2.9	3.2	5.7	4.2	9.9	218
all tillage crops	1.6	2.4	1.2	0.7	0.9	2.1	2.2	3.0	1.9	3.3	5598
all grass	1.2	1.9	1.5	0.3	0.4	2.0	3.8	2.0	0.9	1.2	3468

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	2.8	3.1	1.5	0.8	1.0	2.9	2.7	5.3	1.2	1.5	1899
oilseed rape	3.9	4.0	2.0	1.1	1.3	4.1	3.6	5.4	1.6	1.8	533
winter barley	2.9	3.4	1.9	1.2	1.6	2.9	2.9	5.6	1.6	2.0	498
spring barley	2.3	3.6	2.2	1.0	1.4	2.4	3.1	2.6	1.9	2.4	438
m/c potatoes	9.5	7.5	16.8	9.9	17.4	13.3	10.0	20.7	17.4	29.3	147
sugar beet	3.3	4.1	2.4	2.1	5.6	2.9	3.2	5.7	4.2	9.9	218
all tillage crops	1.9	2.6	1.2	0.7	1.0	2.5	2.3	4.2	2.4	4.1	4883
all grass	1.4	2.2	1.6	0.3	0.5	2.5	4.4	2.5	1.0	1.5	2821

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	7.7	9.2	5.9	3.2	4.0	8.2	8.3	9.8	3.4	4.5	141
oilseed rape	9.2	10.5	6.3	3.9	3.9	9.2	9.2	7.0	3.5	4.5	55
winter barley	7.8	9.8	5.7	3.7	4.1	8.3	8.7	7.6	3.0	3.8	73
spring barley	2.2	3.4	2.5	1.6	1.9	2.0	3.6	2.3	1.6	2.0	294
m/c potatoes	19.1	5.7	23.8	21.9	28.3	22.7	-	23.8	23.5	33.9	23
all tillage crops	2.6	4.7	2.5	1.7	2.0	3.0	5.7	2.4	1.9	2.4	715
all grass	2.6	2.9	3.7	0.8	1.1	2.9	5.8	3.4	1.5	2.1	647

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		129	20	150	40	53
	revised estimate	126	21	147	40	54
all grass		28	47	74	16	20
	revised estimate	28	47	75	16	20
all crops and grass		74	35	109	27	35
	revised estimate	69	36	105	26	34

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 2005

	2005	*% total*
Issued from main sample	1491	100
Non-response [a]	364	24
Response to main sample	1127	76
Issued from reserve sample 1	364	24
Non-response [a]	251	17
Response to reserve sample 1	113	8
Issued from reserve sample 2	251	17
Non-response [a]	185	12
Response to reserve sample 2	66	4
Issued from reserve sample 3	185	12
Non-response [a]	160	11
Response to reserve sample 3	25	2
Achieved sample response	1331	89

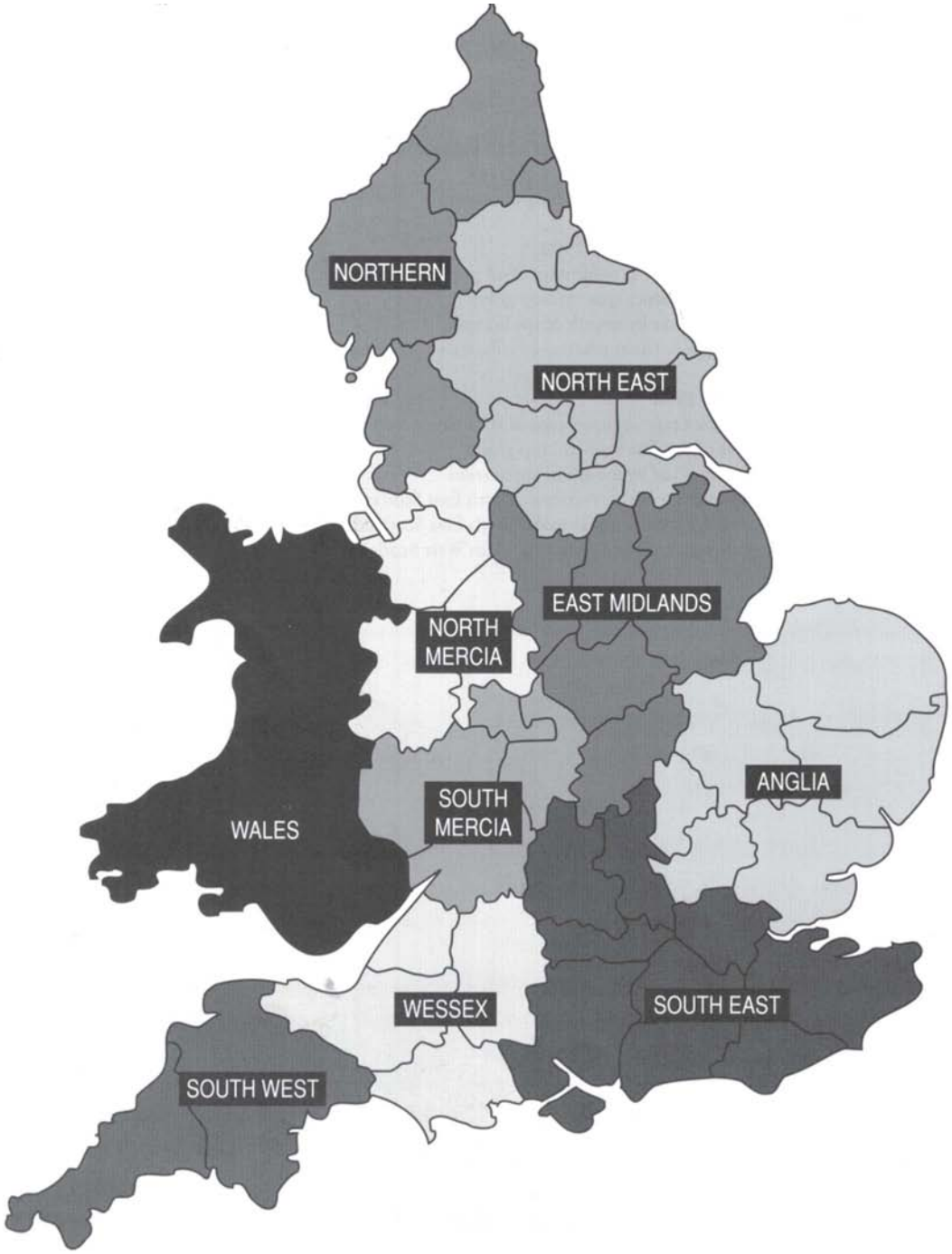
Table App 1.4 Response to main and reserve samples for 2001-2005

Net response rate	*2001 %*	*2002 %*	*2003 %*	*2004 %*	*2005 %*
Overall achieved rate	89	91	84	84	89
Refusal rate [a]	11	9	16	16	11
Main sample	72	77	71	87	85
Reserve sample(s)	28	23	29	13	15
Main reason for refusal	*2001 %*	*2002 %*	*2003 %*	*2004 %*	*2005 %*
Too busy	23	31	38	23	35
Not interested	8	9	16	7	13
Do not do surveys	3	5	10	4	6
Want payment	1	1	1	1	2
Too much paperwork	2	1	3	1	3
Other [a]	63	54	32	64	41

[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	Gloucestershir
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

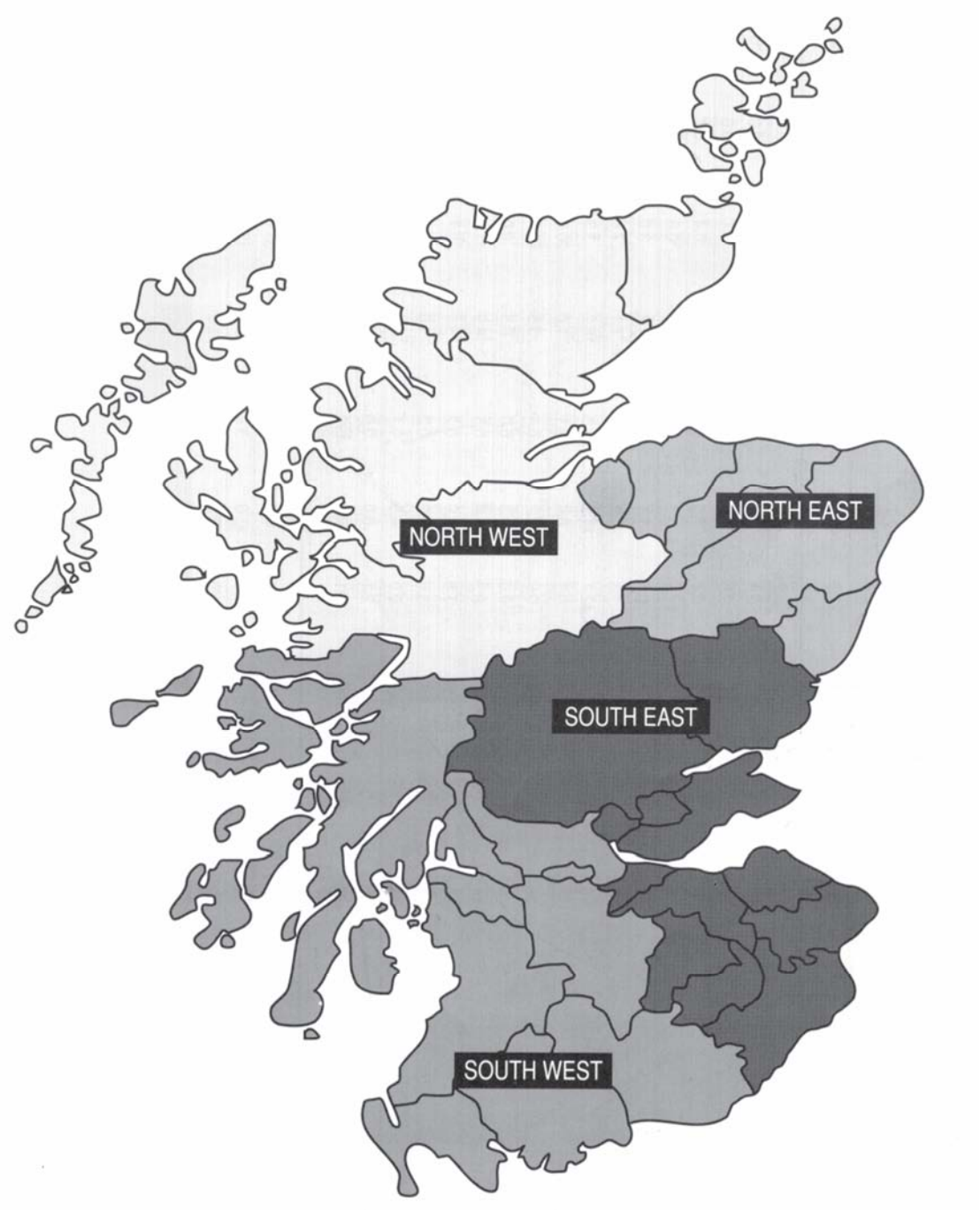
List of English counties indicating the BSFP and Defra Regions[19] within which they fall

	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 CLASSISICATION 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