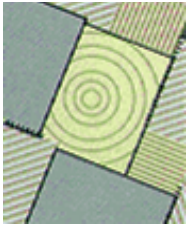
THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2011



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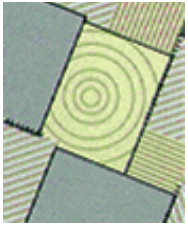

FOREWORD

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

The 2011 Survey was funded by the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Government. 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 2011, the Survey was co-ordinated by GfK Kynetec, who was responsible for the survey design, data collection, statistical analysis and quality control monitoring.

Data uses.

The information in this publication is widely used by the UK government and the EU, industry and researchers and collects data on trends in usage and application rates of nitrogen, phosphate, potash, sulphur, organic manures and lime on agricultural crops and grassland and Great Britain. The data are also used to meet certain legislative obligations at a national and EU level. The data provide important evidence to assess greenhouse gas emissions from agriculture, informing the ammonia and greenhouse gas inventories and for the development of possible mitigation measures. Additionally the data provide information on fertiliser use in NVZs (nitrate vulnerable zones) and for developing and assessing the impact of policy on water quality, particularly the Nitrates Directive (Council Directive 91/676/EEC). The data have also been used for indicators on nutrient balances, other indicators relating to environmental impacts and other cross cutting work looking at links between fertiliser use and productivity (benchmarking) and economic performance. Industry and government use the data to monitor best practice.

Contact details are available at the front of this publication for feedback or for questions about the information provided.

March 2012

ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2011 British Survey of Fertiliser Practice.

We 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).

Kate Benford[1]

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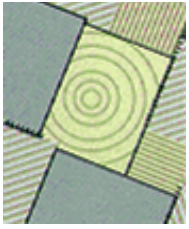

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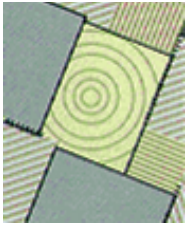

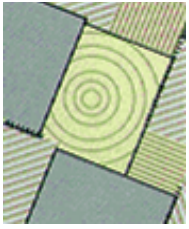

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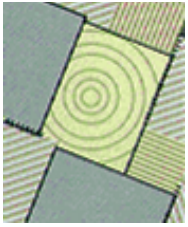
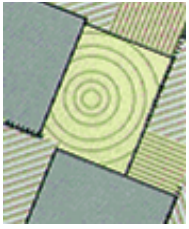
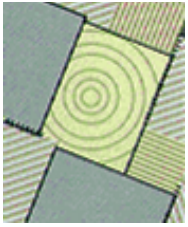






EXECUTIVE SUMMARY

The British Survey of Fertiliser Practice is an annual, nationally representative interview survey based on the selection of a random stratified sample of farms from mainland Britain. In 2011, responses from 1,429 farms were obtained. 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.

The main findings from the 2011 Survey on the use of the nutrients nitrogen, phosphorus, potassium and sulphur in Great Britain are summarised below (Table ES1), with crop level information summarised in tables GB1.1-1.3. Weather and economic factors which may have contributed to recorded changes in fertiliser use during the 2010/2011 cropping season are also discussed in the report in Section A3.1.

Table ES1 Nutrient dressing cover, current and five year mean overall application rates for all crops and grass, Great Britain 2011

	All Tillage	All Grass	All Crops and Grass
Total Nitrogen - N			
Overall application rate, 2011 (kg/ha)	150	57	101
Mean overall application rate, 2007-2011 (kg/ha)	145	59	100
Crop area receiving dressing, 2011 (%)	92	61	76
Straight Nitrogen - N			
Overall application rate, 2011 (kg/ha)	136	28	79
Mean overall application rate, 2007-2011 (kg/ha)	131	27	76
Crop area receiving dressing, 2011 (%)	84	28	54
Compound Nitrogen - N			
Overall application rate, 2011 (kg/ha)	14	29	22
Mean overall application rate, 2007-2011 (kg/ha)	15	32	24
Crop area receiving dressing, 2011 (%)	22	41	32
Total Phosphate - P_2O_5			
Overall application rate, 2011 (kg/ha)	30	9	19
Mean overall application rate, 2007-2011 (kg/ha)	30	10	19
Crop area receiving dressing, 2011 (%)	49	41	45
Total Potash - K_2O			
Overall application rate, 2011 (kg/ha)	39	12	25
Mean overall application rate, 2007-2011 (kg/ha)	40	14	26
Crop area receiving dressing, 2011 (%)	50	42	46
Total Sulphur - SO_3			
Overall application rate, 2011 (kg/ha)	26	2	14
Mean overall application rate, 2007-2011 (kg/ha)	23	2	12
Crop area receiving dressing, 2011 (%)	42	6	23

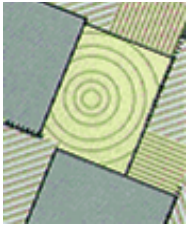
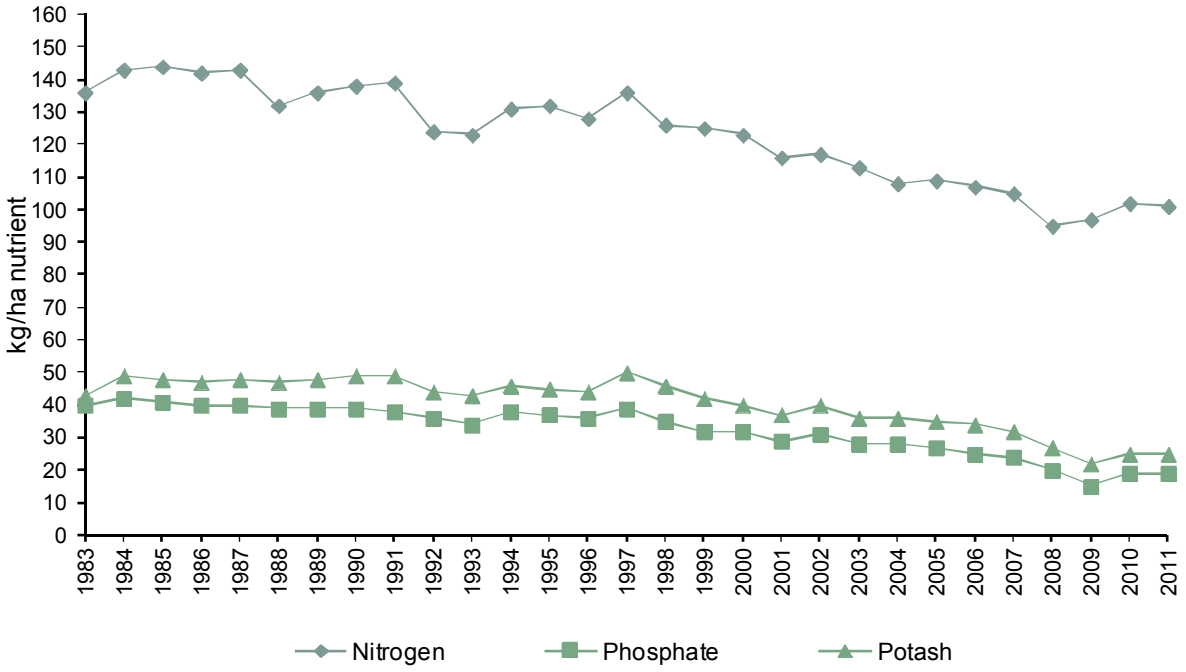
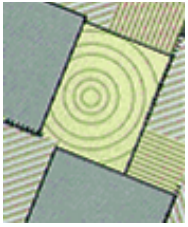


Figure ES1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2011



Nitrogen

- Total nitrogen (N) applied increased by 1 kg/ha on tillage crops and reduced by 6 kg/ha on grassland between 2010 and 2011 to 150 and 57 kg/ha respectively. The total nitrogen rate on all crops and grassland reduced by 1 kg/ha to 101 kg/ha. Overall application rates of nitrogen on tillage crops remain at the levels observed in 2007, following relatively lower rates applied in both 2008 and 2009 (when fertiliser prices were at historically high levels). The reduction in the application rate on grassland is consistent with the declining long term trend. The rate on all tillage has remained relatively constant for the last 25 years within the range 145-150 kg/ha with some wider fluctuations caused by factors such as changes in the crop area or changes in nitrogen applications to specific crops.
- Nitrogen levels applied to grassland have been consistently lower than tillage crops. Since 2000, the overall applications made to grass have fallen consistently relative to those made to tillage crops. The recent decline in cattle numbers is thought to have contributed to this reduction in the nitrogen rate on grassland, possibly in conjunction with some improvement in manure use efficiency, encouraged by a higher nitrogen fertiliser price.
- The overall application rates of nitrogen in 2011 on winter wheat, winter barley and winter oilseed rape were the same as in 2010. Rates on spring barley and maincrop potatoes increased, for the latter sharply, (by 28 kg/ha), though application rates on this crop can vary considerably year on year. The rate on sugar beet reduced by 4 kg/ha between 2010 and 2011. The proportion of crop area (for tillage crops) receiving a straight nitrogen application increased by 3% to 84%, with modest increases on spring barley and potatoes. Dressing cover percentages were unchanged on winter wheat and winter barley in 2011. Overall rates of compound nitrogen applied in 2011 decreased by 1-2 kg/ha since 2010 on major tillage crops, the exception being maincrop potatoes where the rate increased by 13 kg/ha. Dressing cover percentages for compound fertiliser decreased on cereals, with modest increases on potatoes and oilseed rape.
- The 6 kg/ha decrease in overall total nitrogen rate on grassland was caused by a lower dressing covers and decreased average field application rates of straight and compound N. These reductions resulted in an overall total N rate of 57 kg/ha for grassland in 2011.



Phosphate

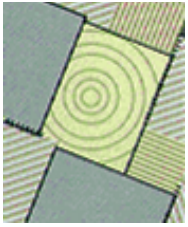
- Overall phosphate (P_2O_5) use on tillage crops and grassland in 2011 was unchanged compared to last year at 19 kg/ha. This more stable situation followed the observed decreased rates between 2008 and 2009 and subsequent increases between the 2009 and 2010 cropping years. The average field rates on tillage crops increased by 1 kg/ha and decreased on grass by 2 kg/ha at 60 and 22 kg/ha respectively. The proportion of land receiving a phosphate dressing decreased for both tillage crops and grassland. In 2011, 49% of all tillage crops and 41% of grassland received a phosphate application, giving five year means of 49% and 43%, respectively.
- Overall phosphate use on tillage crops has gradually declined since 1983, with five-year means of 58 kg/ha in 1983-87, 54 kg/ha in 1988-92, 53 kg/ha in 1993-97, 46 kg/ha in 1998-02, 38 kg/ha in 2003-07 and 30 kg/ha for the period 2007-11. For grassland, the five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-92, 23 kg/ha in 1993-97, 20 kg/ha in 1998-02, 16 kg/ha in 2003-07 and 10 kg/ha for the period 2007-11.

Potash

- The proportion of the area of tillage crops receiving a potash (K_2O) dressing was unchanged from 2010 at 50%. This combined with slightly increased average field rate of potash in 2011 (78 kg/ha) meant the overall rate increased by 1 kg/ha compared to last year to 39 kg/ha. The overall rate on grassland fell by 2 kg/ha to 12 kg/ha as a result of lower average rates and a decrease in the area receiving a dressing.
- Overall potash use on tillage crops has declined since 1983 albeit gradually at first, with five-year means of 64 kg/ha in 1983-87, 63 kg/ha in 1998-92, 62 kg/ha in 1993-97, 57 kg/ha in 1998-02, 52 kg/ha in 2003-07 and 40 kg/ha in 2007-11. The pattern of overall potash use on grassland has been more variable compared to tillage crops, but also shows a net decline between 1983 and 2011. Overall potash rates were relatively stable at 31-33 kg/ha during the mid 1980s - early 1990s but, since then, have tended to decline despite occasional year-on-year increases being recorded.

Sulphur

- The Survey has collected detailed information on sulphur (SO_3) 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. Sulphur is an essential nutrient, being a constituent of proteins. The major reduction in anthropogenic emissions of sulphur dioxide in recent years has resulted in reduced deposition of atmospheric sulphur. This has necessitated increased application of sulphur fertilisers in order to satisfy crop requirements. It is particularly important for certain crop species, such as brassicae which include oilseed rape, where it is additionally used in the formation of natural defence chemicals against pest attack. Dressing covers for sulphur generally remained fairly static until 2002, and then increased steadily to 2007. Dressing covers reduced in 2008 and 2009 for all cereals except winter barley. In 2011 cereals sulphur dressing covers were in the 40%-46% range. The 71% dressing cover for oilseed rape was a 6% increase from 2010.
- In 2011, 23% of all crops and grass received a dressing of sulphur, this figure was 42% for tillage crops. On tillage crops the overall application rate for sulphur was 26 kg/ha, an increase of 2 kg in comparison to last year. Applications on grass were consistent with 2010 at 2 kg/ha, this low overall rate is caused by the low dressing cover, with only 6% of grass receiving a sulphur dressing.



SECTION A

THE BRITISH SURVEY OF FERTILISER PRACTICE

A1 INTRODUCTION AND STRUCTURE OF THE REPORT

The British Survey of Fertiliser Practice (BSFP) is the primary source of data on organic and inorganic fertiliser use in Great Britain. The results from the Survey are used by the British fertiliser industry, by Government and by the wider agricultural community. 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. Section D provides an analysis of the application of organic manures and manufactured fertilisers. Datasets for key data series are available via the Defra website.

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.[2, 3, 4, 5]

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

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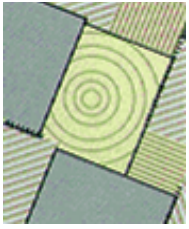
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

[3] 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.

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

[5] 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 International Fertiliser Society* **437**.



A2 SURVEY METHODOLOGY

A2.1 SAMPLE

The Survey sample is selected from the population of agricultural holdings compiled using the June Agricultural Survey (a sample survey conducted annually which records information on farm size, cropping, stocking and employment). In each year, two samples are extracted from the June Survey, one for England & Wales and one for Scotland. Holdings less than 20 hectares in size are excluded from the BSFP sample. 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.

These higher level farm types are based on groupings of the standard UK (and EU) farm classifications (called 'robust' types). Farms with a robust type of 'Other' (robust type 10) are not included in the sample. See A2.3 paragraph 9 for more details.

The target sample size is 1500 farms. This sample size has been designed in order to achieve a statistically representative sample at the national level. The farms are allocated to each of the combinations of farm type and size in proportion to the total area of crops and grass recorded in the June Survey in 2010 (the latest available data). The exception to this is that in England & Wales the number of farms in the horticultural group are sampled at a higher rate to ensure sufficient numbers for a robust estimate to be made. See Tables A2.1 and A2.2 for the number of farms selected.

Three reserves are selected for each farm in the main sample. The reserves will be the nearest holding (using the County/Parish/Holding (CPH) number) and of the same farm type and size. The survey is voluntary. 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.

This resulted in an achieved sample size of 1,429 holdings in 2011. More information on response rates is given in Appendix 1, in Tables App 1.2 and App 1.3. It should be noted that the underlying sample design is constructed to measure manufactured fertiliser usage and may not wholly represent the population of farmers using organic manures so some of this data, especially where sample sizes are small, need to be treated with appropriate caution.

To help improve the survey response and to reduce the year-on-year variability, a core of respondents complete the survey each year. This was introduced in 2000 when approximately one third of the sample agreed to stay in the survey for a number of years. Between 2006 and 2007 a review of the panel structure was undertaken to ensure that the proportion of respondents who had participated on the panel for five consecutive years or more constituted no more than 20% of the total sample. In 2011, 63% of the sample had responded in a previous year. The profile of the panel in terms of farm size was 65% >200ha, 64% 100-200ha, 63% 50-100 ha and 57% >20-50 ha. A higher proportion of the panel representation is made up of larger farms which has helped overcome difficulties in securing participation from this type of farm.

The sample responses are raised to be representative of the national population by using the inverse of the achieved sampling fraction (i.e. the number of holdings in the population divided by the achieved sample size in each strata) as the weight. The validity of the derived weights are assessed by calculating a weighted crop area for the most extensively grown crops by this method and comparing this to the latest available crop area estimates from the June Survey. Standard errors are calculated for key results (major crops) using standard survey statistical methodolology (Appendix 1).

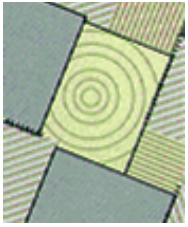


Table A2.1 Derivation of the stratified random sample for the 2011 survey, England & Wales

	farm holdings in population in 2010	total crops and grass in 2010 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
England & Wales						
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	18275	7.2	0.49	90	107	0.59
51-100 ha	16103	13.6	1.05	169	174	1.08
101-200 ha	10947	17.8	2.02	221	225	2.06
200+ ha	4417	17.5	4.95	219	225	5.09
Total livestock & mixed	49742	56.1	1.40	699	731	1.47
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	6898	2.7	0.49	34	29	0.42
51-100 ha	6101	5.2	1.05	64	51	0.84
101-200 ha	5917	10.0	2.08	123	112	1.89
200+ ha	5340	24.5	5.67	303	234	4.38
Total crops	24256	42.4	2.16	523	426	1.76
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	685	0.3	0.89	6	5	0.73
51-100 ha	362	0.3	1.99	7	7	1.93
101-200 ha	205	0.3	3.95	8	9	4.39
200+ ha	112	0.6	12.14	14	9	8.04
Total horticulture	1364	1.5	2.57	35	30	2.20
Total for England & Wales	75362	100		1257	1187	1.58

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2010*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2010*

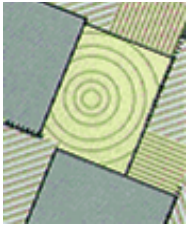


Table A2.2 Derivation of the stratified random sample for the 2011 survey, Scotland

	farm holdings in population in 2010	total crops and grass in 2010 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
Scotland						
Cereal/general						
(Robust types: cereals, general cropping, horticulture)						
crops & grass area						
20-50 ha	1180	2.4	0.51	6	6	0.51
51-100 ha	1434	6.3	1.09	16	15	1.05
101-200 ha	1347	11.5	2.14	29	29	2.15
200+ ha	737	15.1	5.12	38	34	4.61
Total cereal/general	4698	35.3	1.88	88	84	1.79
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	2993	6.1	0.51	15	14	0.47
51-100 ha	3166	13.9	1.09	35	34	1.07
101-200 ha	2560	21.3	2.08	53	51	1.99
200+ ha	1153	23.5	5.09	59	55	4.77
Total livestock & mixed	9872	64.7	1.64	162	154	1.56
Total for Scotland	14570	100		250	238	1.63

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2011 mainly through face to face interview with individual farmers. In addition to collecting information on the fertiliser use on each field, the recorder collected general information on the holding and the use of lime and organic manures and slurries.

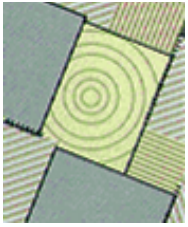
Official quantities of nitrogen, phosphate and potash consumed annually in the UK since 1965 are shown in Table B2.5. These data are based on BSFP findings and confidential trade and sales data which are contributed by AIC industry members who represent over 95% of the market. They are compiled by the Agricultural Industries Confederation in conjunction with Defra.

DATA QUALITY ASSURANCE

Experienced and knowledgeable field staff are used to collect the required information. At data entry, any omitted responses, figures outside pre-agreed limits or other discrepancies are flagged for checking and followed up, often by contacting the survey respondent. Total crop areas reported under this survey are checked against information held in the June Survey. Additionally 10% of interviews undertaken will be subject to a call back by an independent reviewer to check responses to individual questions as part of data quality assurance arrangements. The aggregated figures are checked for consistency and trend analysis against historic data and are subject to independent expert peer review.

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2010*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2010*



ACCURACY AND RELIABILITY OF THE INFORMATION

The sampling variation/standard errors associated with the application rates reported for the main arable crops, all tillage crops and all grass are reported in Appendix 1, Table App1.1. The tables in Section C detail the number of fields in the sample to provide an indication of reliability. Figures reported for some of the smaller crops, where the sample size is relatively low, need to be treated with appropriate caution. 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.

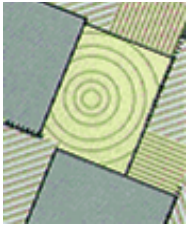
The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 9.0 million hectares in England and Wales and about 1.9 million hectares in Scotland. The estimates of the average 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 definitions of the terms used are set out in Section A of this report.

For potatoes in particular, part of the reason for apparent fluctuations in estimates of nutrient application rates may be because proportionally fewer numbers of fields of potatoes are covered by the Survey. This is due to the fact that fields of potatoes on respondent's farms may be let out and grown by a third party so it is not possible to record information in the Survey. Furthermore, fields of potatoes grown by a respondent but not on his own farm are not captured in the Survey.

REVISIONS POLICY

The figures presented in this report are finalised. We will provide information on any revisions we make to the report or the datasets if any inaccuracies or errors occur.

For this 2011 publication, revisions have been made to the data behind Figure B2.6 which shows the percentage of straw removed from wheat and barley fields for Great Britain, which were published for the first time in the 2010 Survey. The fate of straw relates to the harvest year for the cereal grown, so information gathered under the 2011 survey would relate to the fate of straw from the 2010 cereal harvest and would be reported against 2010 in Figure B2.6.



A2.3 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 2010 to autumn 2011, corresponding to the 2011 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 2010. 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 collected by the survey, but is not included in the calculations of this report.

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

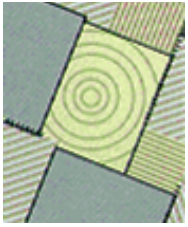
5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser products containing nitrogen and sulphur only are classified with straight 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 and is calculated based on the sown area rather than the total field area. 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). The application rate is calculated on the basis of the sown area rather than the total field area.

   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 EU 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 (lowland)
   (9) Mixed
   (10) Other

   Prior to 2004, the UK agricultural departments amalgamated the robust types 'Specialist Pigs' and 'Specialist Poultry' as the single robust type 'Pigs and Poultry'. 2006 was the first year that the BSFP adopted the revised classification following analysis that showed this would not lead to under-representation of either of these farm types through marginalisation. The composition of 'robust' types is presented in greater detail in Appendix 3. The sampling framework outlined in Section A2.1 can be related to robust types as set out below.

   Revisons to the definitions of farm types can be found at the following link:

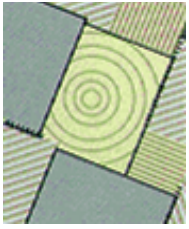
   http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-landuselivestock-june-results-typology.pdf.

   Data presented in tables GB4.1 to GB4.5 are derived from the robust types shown below.

table number	*robust group in table title*	*robust type name*	*robust number*
GB4.1	cereal farms	Cereals	1
GB4.2	general cropping	General cropping and horticulture	2, 3
GB4.3	dairy farms	Dairy	6
GB4.4	other livestock	LFA and lowland grazing livestock	7, 8
GB4.5	mixed farms	Mixed	9

   These robust type groupings are also used in tables D2.3b, D3.2 and D4.2b. Due to the small number of specialist pigs and poultry farms interviewed in the survey, data collected from these robust types have not been presented in any of the tables listed above.

10. Regional analysis of the Survey data for England was classified in two ways in 2011. Table EW4.1a is based on the **Government Office Regions** (GORs) in common with other Defra surveys. Table EW4.1b is based on the former MAFF administrative regions, which were revised in 1996 to take account of changes to county boundaries and nomenclature resulting from the introduction of Unitary Local Authorities between April 1995 and April 1998. These revised regions, termed **BSFP regions**, have been the basis for regional analysis within the survey historically and are detailed in Appendix 2.



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 June Agricultural Survey estimates for areas of individual major crops, crop groupings and total tillage and grassland categories in 2009/10 and 2010/11, and illustrates percentage changes in relative cropping areas over the past five years. There were about 11 million hectares of managed agricultural land in Britain in 2011, of which 4.6 million hectares (42%) were cultivated for tillage cropping and the remainder, 6.4 million hectares, were grassland (excluding rough grazing). Note that the 2010 June Survey was a census of all agricultural holdings.

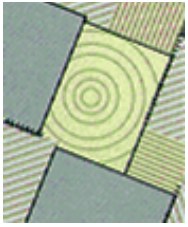
The Single Farm Payment was introduced on 1 January 2005, replacing all the previous main Common Agricultural Policy (CAP) payment schemes with a single payment. To obtain this single payment, farmers must demonstrate compliance with a number of measures designed to protect the environment. One potential impact of cross-compliance, and of environmental schemes, is that margins of fields will remain un-cropped. In this report, as was the case in for the last 5 years, all calculations of fertiliser rates have been made on the basis of sown area rather than field size.

Table A3.1 Cropping and grassland areas ('000 ha) in Great Britain, 2010 – 2011

Crops	June 2010 '000s ha	June 2011 '000s ha	% change since 2010	% change since 2006	2011 crop areas as % of total tillage area
Wheat	1928	1958	1.6	7.3	42.5
Barley – winter	376	352	-6.4	-8.1	7.6
– spring	521	594	14.0	24.8	12.9
Total cereals[1]	*2975*	*3037*	*2.1*	*7.4*	*65.9*
Oilseed rape – total	641	704	9.8	41.1	15.3
Sugar beet	118	113	-4.9	-13.1	2.5
Potatoes[2]	133	141	5.9	4.4	3.1
Linseed	44	36	-16.9	9.1	0.8
Peas/beans[3]	210	155	-26.0	-33.0	3.4
Maize/other fodder	227	227	0	15.2	4.9
Vegetables	120	127	6.2	8.5	2.8
Total tillage[4]	*4563*	*4606*	*0.9*	*7.4*	*100.0*
Set-aside and bare fallow[5]	172	154	-10.3	-76.7	
Grassland					2011 grass areas as % of total grass area
Less than 5 years old	1113	1148	3.1	13.6	17.5
5 years and older	5264	5230	-0.7	-1.1	82.5
Total grass[6]	*6377*	*6378*	*0*	*1.2*	*100.0*
Total crops and grass[7]	*10940*	*10984*	*0.4*	*3.7*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not bare fallow or set-aside.
[5] The obligatory set-aside rate for the 2011 Single Payment Year was set at 0%.
[6] managed grassland, excluding rough grazing.
[7] total tillage + total grassland.

Source: Annual Defra/Scottish Government/Welsh Assembly Government (WAG) June Agricultural Survey data



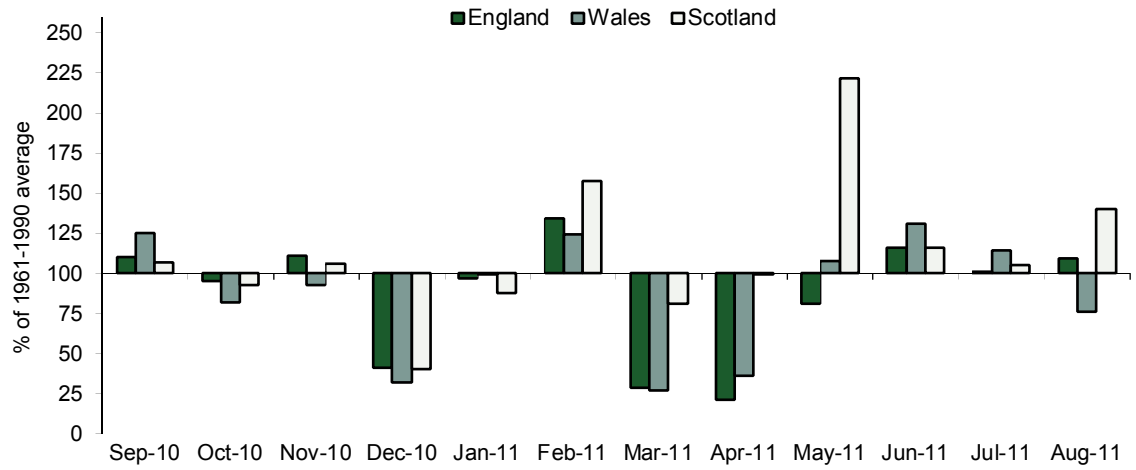
Comparing the 2010 and 2011 cropping years, the total area of uncropped land (bare fallow and set- aside) fell by 10% in 2010. This was predominantly caused by a reduction in land left as bare fallow in England, with the obligatory set aside area remaining at zero in all countries. The total area under tillage crops was increased slightly by 0.9% and cereals increased by 2.1%. The reduction in the winter barley area continued, being down 6.4%, whilst the area of oilseed rape continued its rise. The 14% increase in spring barley area counteracted the 27.4% reduction between 2009 and 2010. The peas and bean area has decreased, as was also the case between 2009 and 2010.

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

- A very wet (or very dry) autumn might 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 leached losses of some nutrients, particularly nitrogen and sulphur. Weather conditions also affect other aspects of soil chemistry and nutrient availability.
- Adverse weather conditions can disrupt planned activities, such as fertiliser spreading.
- Growing conditions determine plant growth and can therefore affect nutrient requirements.

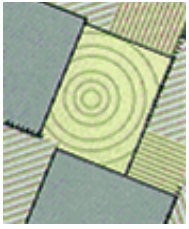
In the autumn of 2010 rainfall was above average, with some parts of the north experiencing 150% of average, whereas Scotland and the south east England were drier than normal. In the last week of November there was significant snowfall in Scotland, north east England and at the end of the month, in south east England. Over England and Wales it was the second coldest winter since 1995/6 with only the previous winter having been colder. December was the coldest in 100 years, with these conditions persisting into January. Overall temperatures finished the winter below normal. In December there were widespread snowfalls until Christmas. February was particularly wet in the north of England and southern Scotland where it was the wettest for 100 years. Spring rainfall was above normal in the north and Scotland, and particularly dry in south and eastern England where less than a third of the normal amount fell. England and Wales had the equal driest spring in a series since 1910. Overall it was the coolest summer since 1993, with only 10 days where the temperature widely exceeded 25 degrees. Summer rainfall was above normal in Scotland, the north east was wet in July and August, with the Midlands relatively dry throughout.

Figure A3.1 Monthly rainfall as a % of the long term average[6]



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 because lower-yielding spring crops often require less fertiliser. In

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



2011 the area of spring barley in Great Britain increased by 14%. The impact of all these factors on fertiliser use are discussed in Section B of this report.

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 2007-11. Comments on longer term trends are made in Section B2.

The estimates of overall application rates from the survey relate to usage on farms during the 2010-11 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 definitions of the terms used are set out in Section A of this report.

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 9.0 million hectares in England & Wales and about 1.9 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 Section C. A summary of data from earlier years is available in Chalmers 2001[7] and historic data for the key data series are also available on the Defra web site.

[7] 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 2011 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. Whilst the data showed a trend of a declining overall application rate on all crops and grass for nitrogen until 2008, the rate then increased as fertiliser prices fell from their historically high level in 2008 and 2009. The 2011 level is little changed on 2010. Overall rates for potash and phosphate declined until 2009, and have similarly stabilised at 19 kg/ha and 25 kg/ha respectively in 2011. Application rates for straight and compound nitrogen applied on crops and grassland are also presented in Table B1.1.

Figure B1.1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 2007 – 2011

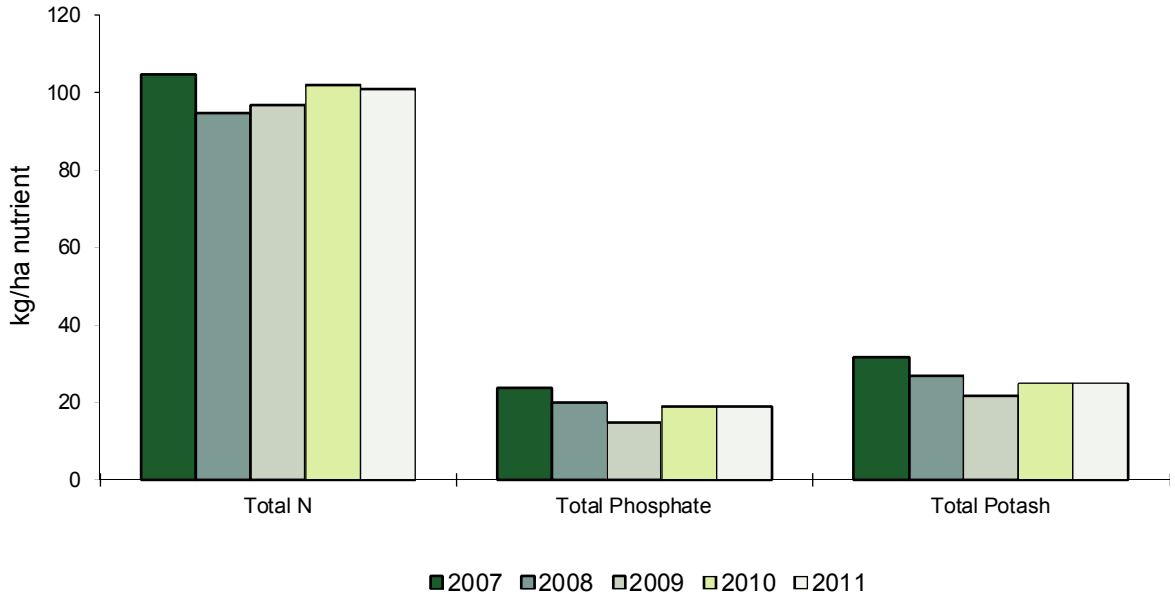


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2007 – 2011

Total nitrogen

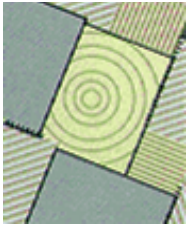
	tillage crops	*grass*	*all crops and grass*
2007	148	65	105
2008	140	55	95
2009	139	57	97
2010	149	63	102
2011	150	57	101

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2007	133	26	77
2008	125	23	71
2009	125	28	75
2010	134	30	78
2011	136	28	79

Compound nitrogen

	tillage crops	*grass*	*all crops and grass*
2007	15	39	28
2008	16	32	24
2009	14	29	22
2010	14	33	24
2011	14	29	22

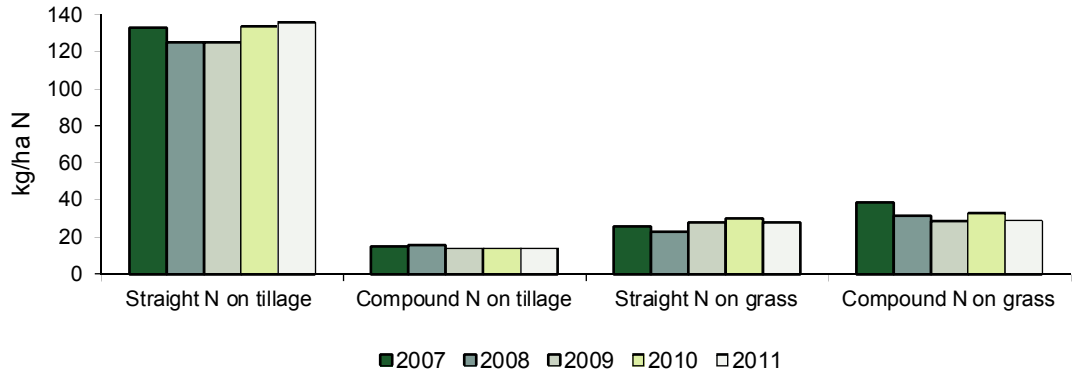


B1.1.1 Nitrogen

All crops and grassland

The 1 kg/ha decrease in total nitrogen use on all crops and grassland (Figure B1.1) was caused by a 6 kg/ha decrease in the overall rate on grass. On grass the overall application rates reduced both for straight and compound N. On tillage crops the rate of straight N increased by 2 kg/ha to 136 kg/ha whilst the rate of compound N has been the same for the last three years. The overall rate of compound N on all crops and grass is at the lowest reported over the five year period 2007-11.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2007 – 2011



Tillage crops

Straight N continues to be the main source of nitrogen on tillage crops, with the proportion of tillage area receiving a straight nitrogen dressing increasing by 3% to 84% in 2011. This increase in dressing cover is responsible for the increase in the overall application rate as the average field application rate on reduced by 3 kg/ha to 162 kg/ha in 2011.

There are a number of reasons for the dominance of straight nitrogen over the use of nitrogen in compound fertilisers, with the principal being the large area of winter-sown crops. As is shown in Table A3.1, about 65% of the tillage area is sown to winter cereals and oilseed rape. These crops will receive most of any necessary dressings of phosphate and potash in the seedbed or during the autumn and winter, leaving just the nitrogen (and sulphur) to be applied, usually as more than one dressing, during the busy spring period of active crop growth. The need for precise timing of nitrogen applications has also contributed to a growing separation of nitrogen applications from those of other nutrients for spring-sown crops, especially spring cereals and sugar beet. Thus a continuing increase in the use of straight nitrogen now applies to spring-sown crops, including potatoes, for agronomic and environmental reasons, as well as for the optimisation of logistics and the efficient use of time in the spring.

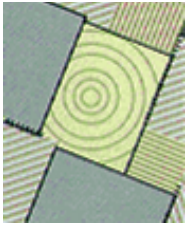
Grassland

In 2008 the overall nitrogen application rate of 55 kg/ha was the lowest reported for the whole survey period since 1983 (see section B2). The 6 kg/ha decrease to the overall N application rate in 2011 was due to a lower proportion of the grass area receiving a dressing of straight N with the same being the case for compound N. The average field rate of straight N decreased by 5 kg/ha to 99 kg/ha, whilst the compound N average field rate reduced by 4 kg/ha to 72 kg/ha.

B1.1.2 Phosphate and Potash

Phosphate

Table B1.2 shows overall phosphate applications for the past five years. The 2009 rates were the lowest since this data set began in 1983 for both tillage (23 kg/ha) and grass (9 kg/ha). This trend was reversed on



tillage crops in 2010 with an increase to the overall rate of 7 kg/ha. The 2011 phosphate rate on tillage was unchanged at 30 kg/ha, with a stable proportion receiving a dressing (49%) and average field rate (60 kg/ha). For grassland the overall rate has been more stable, and 2011 saw a 2% decrease in dressing cover and a 2 kg/ha decrease in average field rate to 22 kg/ha. The five year means for overall phosphate rates for tillage crops and grass were 30 and 10 kg/ha respectively.

Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2007 – 2011

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2007	34	14	24
2008	31	10	20
2009	23	9	15
2010	30	10	19
2011	30	9	19

Total potash

	tillage crops	*grass*	*all crops and grass*
2007	47	18	32
2008	43	13	27
2009	33	12	22
2010	38	14	25
2011	39	12	25

Potash

As with phosphate, overall potash use in 2009 fell to the lowest ever recorded by the Survey on tillage crops (33 kg/ha) and grassland (12 kg/ha) alike. In 2010 overall potash use increased by 5 kg/ha on tillage with a further increase of 1 kg/ha in 2011. On grassland the overall rate decreased by 2 kg/ha to 12 kg/ha, reversing the gain observed in 2010. On tillage crops the proportion of the area receiving a dressing of potash was the same as in 2010 at 50%, whilst the average field rate increased by 2 kg/ha. On grass dressing cover reduced by 2% to 42% and the average field rate declined by 3 kg/ha to 29 kg/ha.

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 2011 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.

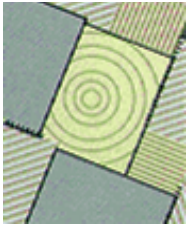


Table B1.3 Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2007 – 2011

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	190	98	136	131	189	92
2008	178	94	134	154	191	86
2009	188	100	140	168	185	94
2010	193	98	142	135	197	93
2011	193	101	142	163	197	89

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	182	61	124	30	181	82
2008	169	56	120	40	183	77
2009	180	69	129	50	178	90
2010	185	64	127	34	190	86
2011	186	69	129	50	189	81

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	8	37	12	102	8	10
2008	9	39	15	114	9	9
2009	7	31	10	118	7	5
2010	8	34	15	101	8	7
2011	7	32	13	114	8	8

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	31	36	35	130	30	41
2008	27	34	35	130	29	31
2009	17	29	22	141	20	20
2010	27	35	33	120	29	29
2011	29	35	30	118	26	26

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	39	49	59	199	38	104
2008	36	47	51	235	36	90
2009	23	41	34	245	24	73
2010	31	46	47	204	29	78
2011	33	46	46	204	27	76

[a] Figures for maincrop potatoes include second earlies.

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

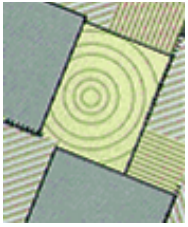


Table B1.4 Average field rates (kg/ha) on major tillage crops, Great Britain 2007 – 2011

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	193	102	139	144	190	95
2008	181	99	138	156	193	92
2009	190	103	142	181	186	98
2010	195	104	145	139	198	98
2011	196	106	143	170	197	93

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	189	91	135	76	183	89
2008	177	88	132	99	186	88
2009	187	94	137	121	182	95
2010	191	93	136	80	194	94
2011	192	93	137	90	191	89

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	58	65	61	131	40	69
2008	74	64	63	147	46	65
2009	72	61	64	140	37	41
2010	64	59	62	126	44	62
2011	70	59	67	134	40	75

Total phosphate

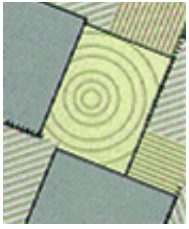
	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	62	51	58	149	61	77
2008	61	48	56	147	61	58
2009	54	48	53	159	54	47
2010	60	50	55	138	60	58
2011	62	51	53	133	59	60

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2007	76	64	80	221	72	126
2008	76	62	74	249	71	112
2009	72	61	72	272	67	109
2010	72	64	73	231	67	112
2011	75	65	74	225	66	112

[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

Increases in overall rates of total nitrogen (Table B1.3) between 2010 and 2011 were seen for spring barley and maincrop potatoes, whilst the rate reduced on sugar beet. Rates on winter wheat, winter barley and oilseed rape were unchanged from 2010. Average field rates (Table B1.4), which are unaffected by changes in dressing cover, saw increases for winter wheat, spring barley and potatoes, whilst those on winter barley, oilseed rape and sugar beet decreased.

Winter wheat

The field cropping information collected in the Survey enables separate estimates to be made of nitrogen fertiliser use on milling and non-milling (seed/feed) categories of winter wheat (Table B1.5). The difference between the rates applied to milling and non-milling wheats reflect differences in crop husbandry and nitrogen management practices.

Table B1.5 Average field application rates (kg/ha) of nitrogen on cereals by market use, Great Britain 2007 – 2011

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2007	212	184	107	96	129	145
2008	202	174	102	95	120	144
2009	211	180	105	100	139	143
2010	217	183	108	96	133	150
2011	220	184	110	98	134	147

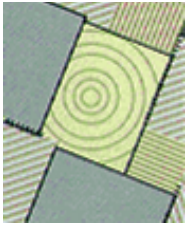
Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice[8]. Milling varieties are often grown as a second wheat and often receive extra nitrogen, 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 such as oilseed rape. 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.

The non-milling crop continues to dominate the wheat crop area (Table B1.6) with only 33% of the crop area in 2011 being grown as milling wheat (5 year mean: 32%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2007 – 2011, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2007	33	67	56	44	37	63
2008	27	73	54	46	27	73
2009	33	67	57	43	34	66
2010	35	65	61	39	29	71
2011	33	67	62	38	34	66

[8] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9.



Spring barley

Overall use of total nitrogen on spring barley increased by 3 kg/ha in 2011 to 101 kg/ha which is slightly higher than the five year mean of 98 kg/ha. The overall application rate of straight nitrogen increased to 69 kg/ha, whilst the overall application rate for compound N decreased to 32 kg/ha. This reflects the trend since 2005 for a reducing percentage of the spring barley area receiving a dressing of compound N (55% in 2011 compared to 66% in 2005). The average field rate for total nitrogen was 106 kg/ha in 2011, continuing to recover some of the trend of decline since the value of 114 kg/ha in 2001.

Further analysis of the data by crop type (Table B1.5) shows the average rate applied to the spring malting crop had increased from 108 kg/ha in 2010 to 110 kg/ha in 2011. For non-malting crops the nitrogen application rate increased by 2 kg/ha to 98 kg ha, with a five year mean of 97 kg/ha.

Estimated nitrogen rates on spring barley crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 9 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)[9]. 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 2007-11 is 58%.

Winter barley

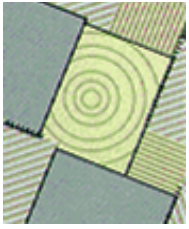
In the period 2002-08 overall total nitrogen use on winter barley decreased from year to year, down to 134 kg/ha in 2008. This rate increased by 6 kg/ha to 140 kg/ha in 2009, with further 2 kg/ha increases seen in 2010 and 2011. The straight nitrogen rate increased by 2 kg/ha whereas the compound nitrogen rate increased by 2 kg/ha in 2011.

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 on malting crops decreased by 1 kg/ha to 134 kg/ha with the 5 year average at 131 kg/ha. For non malting crops the average field rate decreased by 3 kg/ha to 147 kg/ha in 2011 (Table B1.5), with the 5 year average being 146 kg/ha.

The higher application rates of nitrogen (five-year mean of +15 kg/ha) on non-malting, compared to malting winter barley crops, reflect typical agronomic practice, although the gap between malting and non malting crops was less than in previous years. 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.

The proportion of relative crop area grown for malting was 34% in 2011, which was typical of the recent past, with the five year mean calculated as 32%. (Table B1.6).

[9] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9.



Maincrop potatoes

Total nitrogen use on maincrop potatoes has fluctuated over the last five years. Part of the reason for recent apparent fluctuations in the estimates of nutrient application rates may be because proportionally fewer fields of potatoes are covered by the Survey. This is due to the fact that fields of potatoes on respondent's farms may be let out and grown by a third party, so it is not possible to record information in the Survey. Furthermore, fields of potatoes grown by a respondent but not on his own farm are not captured in the Survey.

In 2009 the rate was at its highest for the period at 168 kg/ha, and in 2011 was 163 kg/ha, above the five year mean of 150 kg/ha. (Table B1.3). This increase in 2011 is due to increases in the average field rates of straight and compound nitrogen (Table B1.4), as well as an increase in the area receiving straight or compound nitrogen fertiliser (55% and 85% respectively).

Oilseed rape

In 2011, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, was unchanged from the previous year at 197 kg/ha (five year mean 192 kg/ha).

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 decreased by 1 kg/ha between 2010 and 2011, a more modest change than the 10 kg/ha increase seen in between 2009 and 2010. The rate for the spring crop increased by 22 kg/ha. It should be remembered that this crop represents only about 3% of the total oilseed rape area and data for it are drawn from a much smaller number of sample points and should consequently be treated with caution.

Table B1.7 Average field application rates of nitrogen (kg/ha) on winter and spring oilseed rape, Great Britain 2007 – 2011

Total nitrogen (kg/ha)

	winter oilseed rape	*spring oilseed rape**
2007	191	127
2008	194	115
2009	190	120
2010	200	121
2011	199	143

* Spring oilseed rape data are more variable due to smaller crop area

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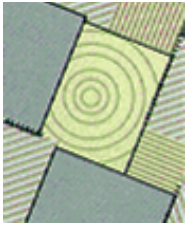
Sugar beet

The overall nitrogen use on sugar beet fell by 4 kg/ha in 2011 to 89 kg/ha, this is in line with the five year mean (91 kg/ha). The proportion of crop area receiving a nitrogen dressing was 96% and this is consistent with the previous two years. The average field rate of compound nitrogen rose by 13 kg/ha, although dressing cover with compound nitrogen is low at 11% of the sugar beet area in comparison to 91% dressing cover with straight N.



B1.2.2 Phosphate and Potash

Phosphate

In 2011 the overall phosphate rate increased on winter wheat by 2 kg/ha to 29 kg/ha. This was caused by an increase in the average field rate and a 1% increase in the proportion of the crop receiving a phosphate dressing. The overall rate was unchanged on spring barley and decreased on all the other major tillage crops. Lower overall rates were caused by decreased average field rates on winter barley, maincrop potatoes and oilseed rape (Table B1.4) and a reduced percentage dressing cover on sugar beet. The overall phosphate rate of 30 kg/ha for tillage crops is in line with the 2007-11 five year average.

Potash

Overall potash use on tillage crops increased in 2011 by 1 kg/ha, to 39 kg/ha. This followed a 10 kg/ha reduction in overall potash rate between 2009 and 2010 to 33 kg/ha. The decrease in overall potash rate on tillage crops in 2011 was caused by a 2 kg/ha reduction in average field rate as the proportion of the crop area receiving a dressing was consistent at 50% across the two years. The average field rates for the major tillage crops increased for cereals and were unchanged on sugar beet. The average field rates for potash decreased on potatoes (by 6 kg/ha) and on oilseed rape (by 1 kg/ha). As noted for nitrogen, part of the reason for recent apparent fluctuations in estimates of nutrient application rates for potatoes may be because of the many fields which are grown by third parties and are not recorded, thereby reducing the robustness of the estimates.

B1.2.3 Sulphur

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. Dressing covers for sulphur then generally remained fairly static until 2002 when the areas increased steadily until 2007. 2008 saw reductions in dressing covers for cereals at 35%-43%, a pattern that continued in 2009, except in winter barley where sulphur dressing cover increased to 45%. In 2011 cereals dressing covers with sulphur were in the 40-46% range. In oilseed rape the 7% increase in dressing cover has meant that this has returned to the 2007 and 2008 figures. (Table B1.8). In 2011 average field rates increased on winter wheat and oilseed rape and were largely static on spring barley, with a 3 kg/ha reduction on winter barley.

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2007 – 2011

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2007	46	44	36	70
2008	43	42	35	70
2009	39	45	32	60
2010	42	44	42	64
2011	46	46	40	70

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2007	51	53	43	80
2008	51	46	42	85
2009	47	50	41	79
2010	55	49	41	86
2011	57	46	40	88

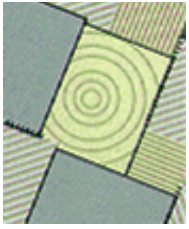


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of the risk of sulphur deficiency in Scotland due to historically extremely low levels of atmospheric sulphur deposition, compared to most other areas of Britain. It is clear that arable farmers in England & Wales became more aware of the need to apply sulphur, illustrated by the increasing percentage dressing cover figures for all major tillage crops between 2004 and 2007. In 2011 these percentage dressing covers remain at or below the peaks seen in cereals and in oilseed rape.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2007 – 2011

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2007*	46	45	38	72
	2008	43	42	42	70
	2009	39	44	34	60
	2010	41	42	42	64
	2011	45	45	40	70
Scotland*	*2007*	56	39	32	53
	2008	48	42	27	66
	2009	54	55	30	67
	2010	56	52	41	61
	2011	58	50	39	68

* Scottish data may appear more variable due to smaller sample sizes.

B1.3 FERTILISER USE ON GRASSLAND

Overall fertiliser usage on grassland in Great Britain in the last five years, as previously shown (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 2007 – 2011

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2007	26	39	65	14	18
2008	23	32	55	10	13
2009	28	29	57	9	12
2010	30	33	63	10	14
2011	28	29	57	9	12

Dressing cover for total nitrogen on grass decreased by 2% between 2010 and 2011 to 61% (Table B1.11). The long term trend is for declining dressing cover for total nitrogen but the proportion receving a dressing remains above the 58% low reported in 2008. As in previous years, a higher proportion of grass received compound N as opposed to straight N, but the average field rate for compound N is three quarters of the straight N rate of 99 kg/ha.

Overall application rates for phosphate and potash decreased marginally on grass to 9 and 12 kg/ha respectively.

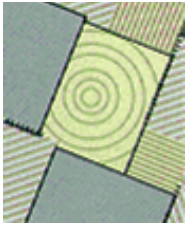


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2007 – 2011

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2007	26	49	66	51	51
2008	25	42	58	42	42
2009	28	39	59	38	39
2010	29	43	63	43	44
2011	28	41	61	41	42

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2007	103	79	99	27	35
2008	93	77	95	24	32
2009	100	76	98	23	30
2010	104	76	100	24	32
2011	99	72	93	22	29

The proportion of the grass area receiving a straight nitrogen dressing decreased by 1%, to 28% and compound N dressing cover decreased by 2% to 41% in 2011. Dressing cover percentages of phosphate and potash also decreased by 2% to 41% and 42% of grass area for 2011. The five year means are 43% and 44% respectively.

Average field rates for phosphate and potash were at their lowest level for the five year period in 2011, falling to 22 kg/ha for phosphate and 29 kg/ha for potash.

B1.3.1 Nitrogen

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 Great Britain in 2011 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2007 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, although these may still be the best estimates of grassland utilisation by area.

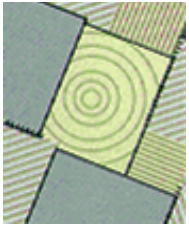
Table B1.12 Grassland utilisation (% of grass area), Great Britain 2007 – 2011

	grazed [a]	*silage* [b]	*hay* [b]
2007	92	30	12
2008	95	29	12
2009	93	29	12
2010	91	31	12
2011	90	29	11

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2011 is slightly below the five year mean of 92%.

[a] May also be cut.

[b] May also be grazed.



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 with rates being lowest in grass cut for hay, higher in grass which is grazed and higher still in grass cut for silage.

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2007 – 2011

Total nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2007	63	106	47	97	128	81
2008	52	96	40	92	121	74
2009	55	104	40	95	124	82
2010	59	106	48	97	128	82
2011	52	99	39	89	121	70

Straight nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2007	26	40	19	101	118	75
2008	22	37	21	91	104	75
2009	27	49	23	98	113	88
2010	29	51	24	103	117	81
2011	26	47	21	95	116	75

Compound nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2007	38	66	28	76	99	73
2008	30	59	19	73	97	73
2009	28	55	17	73	96	67
2010	30	55	24	72	97	71
2011	26	53	17	68	94	54

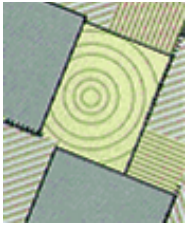
In 2011 the overall total nitrogen rates for both the grazed and silage categories decreased by 7 kg/ha to 52 and 99 kg/ha respectively. The decrease in overall application rates was caused by lower average field rates and an decreased proportion of the grass receiving a dressing of N.

Overall application rates and average field rates of straight nitrogen decreased in all categories of grass in 2011. Compound nitrogen rates decreased for all categories of grass which is in line with the long term downward trend. The five year means for the overall compound nitrogen rate are 30, 58 and 21 kg/ha for grazed grass, silage and hay respectively, a decrease on last year's five year means.

The fall in nitrogen use over the long term on grassland is likely to be related in part to decreases in ruminant livestock numbers which may have reduced herbage production requirements.

[a] May also be cut.

[b] May also be grazed.



B1.3.2 Phosphate and Potash

Phosphate and potash requirements for grassland depend, as for nitrogen, on the system of sward management with overall application and field rates for both phosphate and potash being higher in grass cut for silage.

Table B1.14 Phosphate and potash use (kg/ha) by grassland utilisation, Great Britain 2007 – 2011

Total phosphate

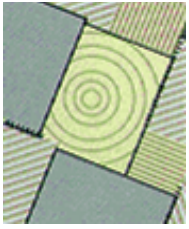
	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2007	13	21	11	26	31	30
2008	9	18	7	23	30	22
2009	8	15	7	22	28	26
2010	10	16	10	23	29	28
2011	8	15	7	21	28	21

Total potash

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2007	17	33	15	33	48	37
2008	12	28	8	30	44	26
2009	11	25	9	29	42	33
2010	13	26	12	30	44	33
2011	11	24	9	27	41	27

Overall phosphate rates decreased in 2011 and are at the lowest for the five year period (Table B1.14). In 2011 the overall phosphate rates decreased by 1-3 kg/ha across the different grassland management systems. The corresponding five-year means for grazed grass, silage and hay were 10, 17 and 8 kg/ha, respectively. Average field rates showed a similar pattern of decrease over 2010.

Like phosphate, overall potash rates have declined between 2007 and 2011 to reach a five year low across grazed and silage grassland. In 2011 both overall and average field rates decreased by 2-3 kg/ha.



B1.3.3 Sulphur

In 2011, only 6% of the total grassland area received a sulphur dressing (mean 5% for 2007-11 period). Of this, a higher proportion of grassland cut for silage is treated with sulphur compared to grazed grass or grass cut for hay (Table B1.15). Estimated dressing covers have fluctuated slightly in the past five years, with no categories of grassland increasing in 2011.

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.

Table B1.15 Sulphur use on grassland, Great Britain 2007 – 2011

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2007	5	10	4	5
2008	4	9	4	5
2009	5	12	5	5
2010	6	11	5	6
2011	6	11	3	6

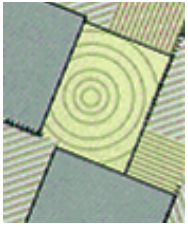
Average application rate per year (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2007	45	47	28	43
2008	33	34	44	33
2009	29	29	26	29
2010	29	32	37	30
2011	37	39	35	36

Estimated average field rates of sulphur application peaked for grazed and silage grass in 2007 and for hay in 2008. In 2011 average field rates increased for grazed and silage cut for grass, with a slight decrease in that cut for hay. The five year means are 35, 36 and 34 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.

[a] May also be cut.

[b] May also be grazed.



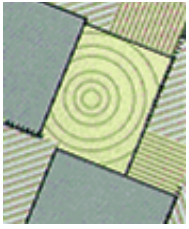
B2 LONGER TERM TRENDS FOR GREAT BRITAIN

B2.1 NITROGEN USE

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 since been collated in order to report an aggregated series for nutrient use in Great Britain since 1983, when the survey in Scotland started.

Table B2.1 Total overall nitrogen application rates (kg/ha), England & Wales 1972 - 2011 and Scotland and Great Britain 1983 – 2011

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1972	91	-	-	83	-	-	-	-	-
1973	89	-	-	85	-	-	-	-	-
1974	85	-	-	91	-	-	89	-	-
1975	86	-	-	99	-	-	93	-	-
1976	96	-	-	98	-	-	97	-	-
1977	100	-	-	110	-	-	111	-	-
1978	105	-	-	113	-	-	114	-	-
1979	113	-	-	117	-	-	121	-	-
1980	121	-	-	119	-	-	120	-	-
1981	135	-	-	125	-	-	130	-	-
1982	141	-	-	123	-	-	132	-	-
1983	154	113	149	125	131	126	139	124	136
1984	162	121	157	132	127	131	147	125	143
1985	161	131	157	131	130	131	146	130	144
1986	156	119	152	135	120	132	146	120	142
1987	160	139	157	133	116	130	147	125	143
1988	149	125	146	116	132	119	133	129	132
1989	150	128	147	127	111	124	139	118	136
1990	149	131	147	132	116	129	141	122	138
1991	154	128	151	133	111	129	143	117	139
1992	147	125	145	104	111	106	126	116	125
1993	137	130	137	112	114	112	124	119	124
1994	149	128	147	117	112	116	133	118	130
1995	151	140	149	119	114	118	134	124	132
1996	148	122	145	118	100	115	133	108	128
1997	151	134	149	123	124	123	137	128	136
1998	146	131	144	107	119	109	127	124	126
1999	143	126	141	108	117	110	126	121	125
2000	154	135	149	95	110	99	124	118	123
2001	144	147	145	90	113	94	114	127	116
2002	153	143	150	85	105	89	116	119	117
2003	152	135	149	79	102	83	112	114	113
2004	154	134	152	73	93	77	110	108	108
2005	152	134	150	72	84	74	110	102	109
2006	150	121	147	69	86	72	108	98	107
2007	152	120	148	64	72	65	108	90	105
2008	144	111	140	52	66	55	98	82	95
2009	143	113	139	54	69	57	99	84	97
2010	153	114	149	62	64	63	107	81	102
2011	154	123	150	57	59	57	105	80	101



The aggregated data for Great Britain follow a similar pattern to that observed for England & Wales because a large proportion of both the tillage an grassland areas in Britain is located in England & Wales. Overall total nitrogen rates for tillage crops and grassland in England & Wales since 1972 and in Scotland and Great Britain since 1983 are summarised in Table B2.1. The data for Great Britain are presented graphically in Figure B2.1. Overall nitrogen use has been consistently higher on tillage crops than on grassland ever since the British survey started.

Apart from a dip in 1992-93 due to the introduction of set-aside, the overall rate of total nitrogen on tillage land stayed within the range 145-150 kg/ha with some wider fluctuations caused by factors such as changes in the crop area or changes in nitrogen applications to specific crops (see Figure B2.3). The rate for 2011 is within that range, with the overall rate of nitrogen on tillage crops for Great Britain being 150 kg/ha.

Nitrogen levels applied to grassland have always been lower than tillage crops. From 1983 until 1999, the difference was fairly constant, averaging 27 kg/ha. Since 2000, the overall applications made to grass have fallen consistently relative to those made to tillage crops, and for the last five years the average difference in overall nitrogen rate is 86 kg/ha. The recent decline in cattle numbers is thought to have contributed to this reduction in the nitrogen rate on grassland, possibly in conjunction with some improvement in manure use efficiency, encouraged by a higher nitrogen fertiliser price.

Data on straight and compound nitrogen for Great Britain are not available for the period 1983-91 when the survey in Scotland was separate from the one in England & Wales. Figure B2.2 shows the overall rates of straight and compound nitrogen on tillage crops and grassland. Most of the total nitrogen fertiliser used on tillage crops each year has been applied in straight form. There is a marked difference for grassland where compound nitrogen accounts for around two thirds of the total applied.

Figure B2.1 Overall application rates (kg/ha) of total nitrogen on tillage crops and grassland, Great Britain 1983 – 2011

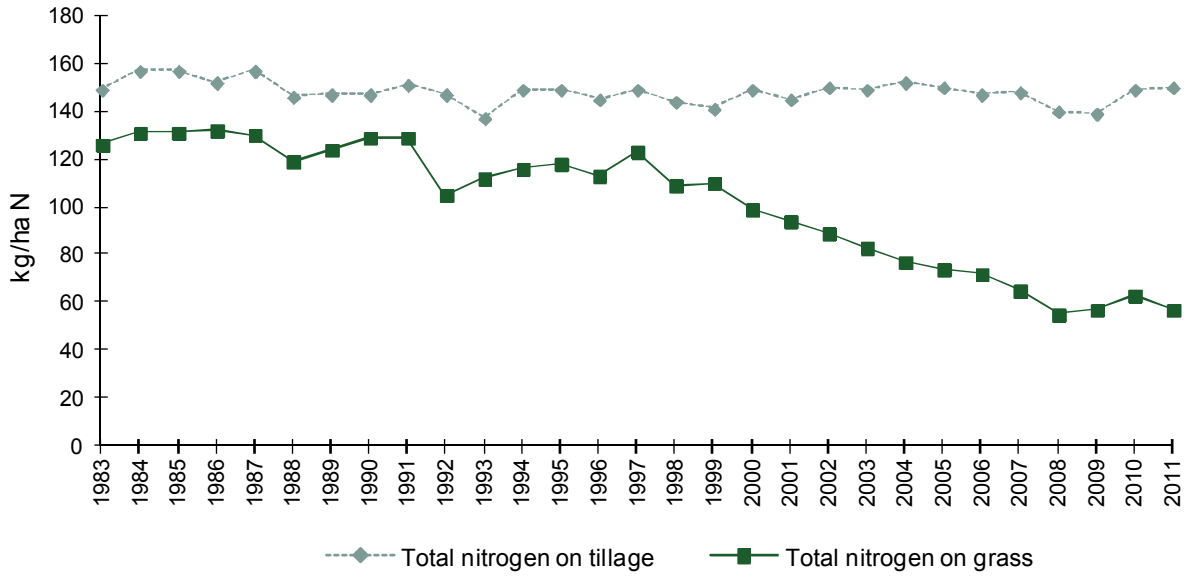
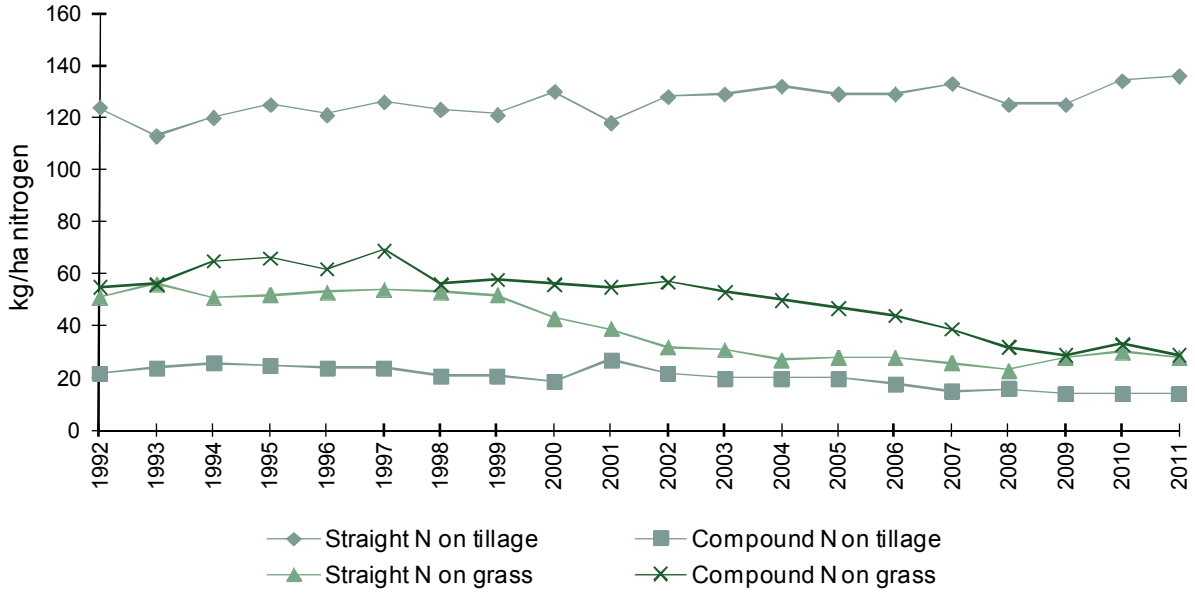


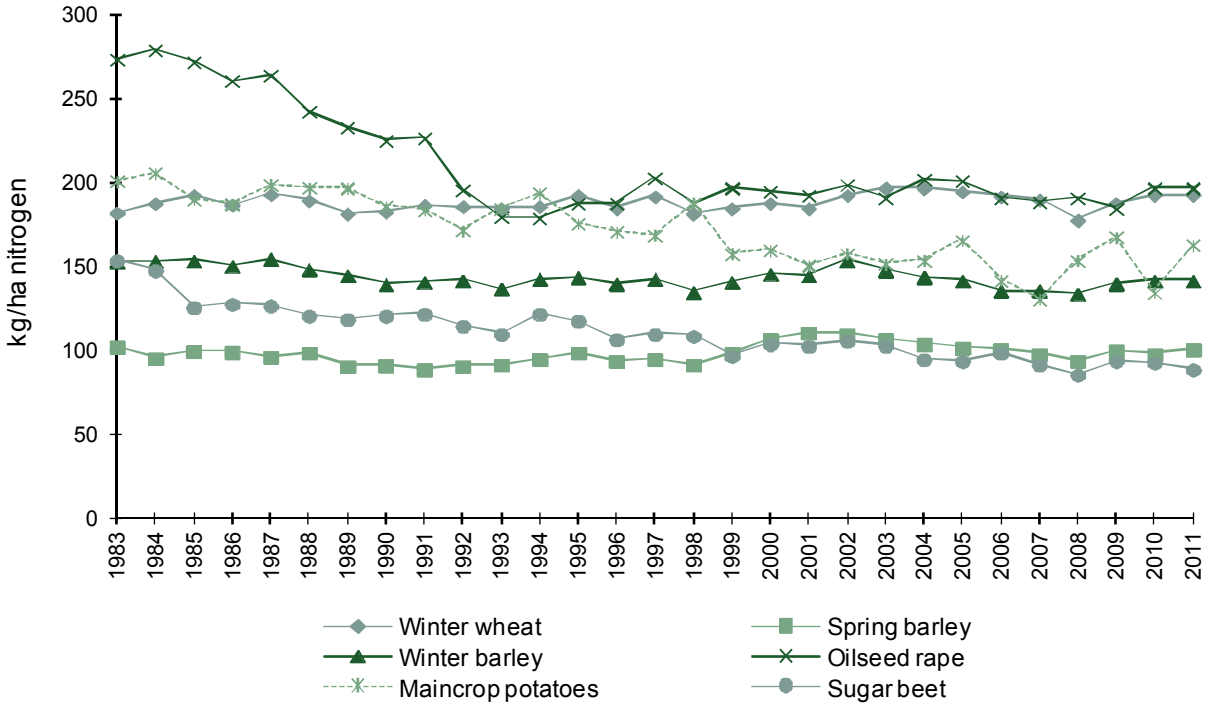
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2011

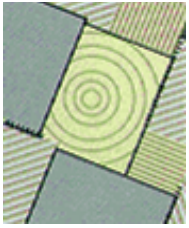


B2.1.1 Nitrogen use on major tillage crops

Overall application rates of total nitrogen on the main arable crops in Great Britain since 1983 are shown in Figure B2.3.

Figure B2.3 Overall application rates (kg/ha) of total nitrogen on major arable crops, Great Britain 1983 – 2011





B2.1.2 Autumn and winter applications of nitrogen fertiliser

The British Survey of Fertiliser Practice is able to monitor the extent to which recommended agronomic advice is adopted. By analysing the month during which fertiliser applications are made it is possible to assess the extent to which autumn and winter nitrogen is applied to winter cereals and oilseed rape. The standard advice is that autumn nitrogen is not required for winter cereals, as economic yield benefits are rare and autumn-applied nitrogen is vulnerable to leaching loss. The Great Britain values have remained below 10% of the crop area treated for both winter cereal crops since 2003, and despite some minor fluctuations the trend is for reduced dressing cover of autumn applied nitrogen on winter cereals. The area receiving autumn nitrogen is too low for data relating to average field application to be used.

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.

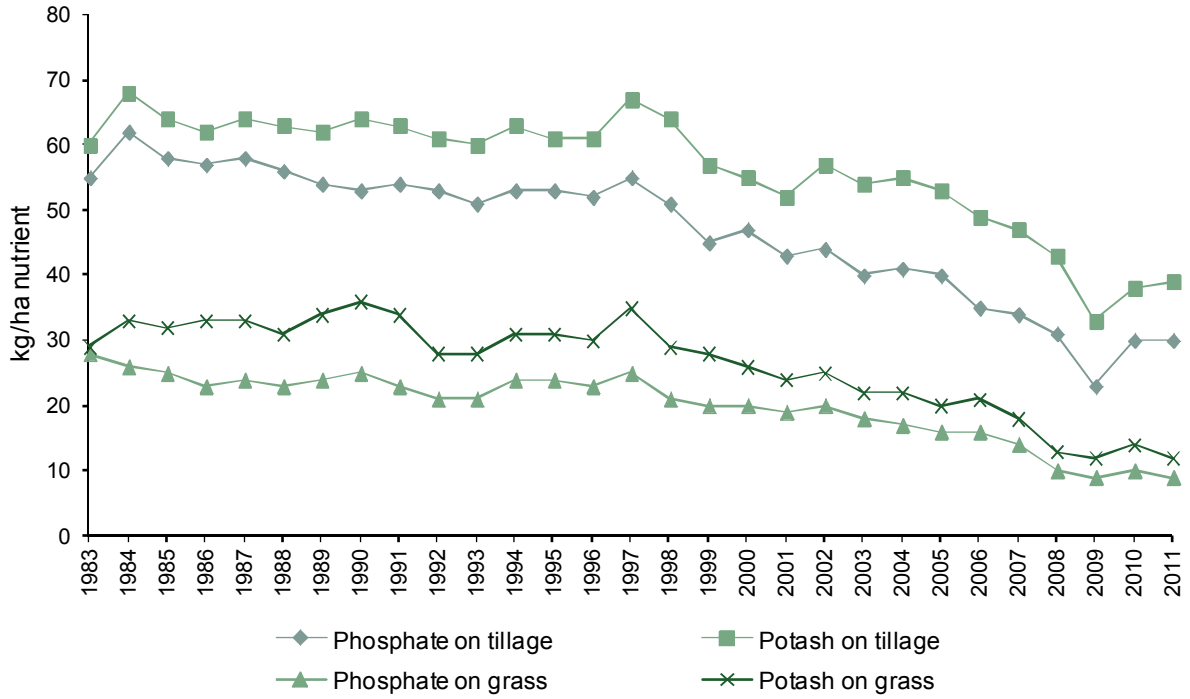
Table B2.2 Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape and average application rate (kg/ha) for winter oilseed rape, England & Wales 1985 – 1998 and Great Britain 1999 – 2011

	winter wheat	*winter barley*	*winter oilseed rape*	
	dressing cover	*dressing cover*	*dressing cover*	*application rate*
England & Wales				
1983	67	77	-	-
1984	66	77	-	-
1985	56	64	88	52
1986	44	50	81	52
1987	36	43	74	53
1988	28	31	64	45
1989	18	25	52	45
1990	10	16	45	42
1991	11	12	49	46
1992	8	10	50	44
1993	8	8	41	42
1994	12	16	44	39
1995	11	13	48	38
1996	11	12	51	37
1997	12	11	44	36
1998	7	12	34	38
Great Britain				
1999	6	10	35	43
2000	7	11	33	42
2001	7	14	43	43
2002	8	16	41	47
2003	5	9	42	39
2004	6	9	35	40
2005	4	9	42	41
2006	5	7	28	35
2007	3	5	27	42
2008	3	6	31	34
2009	2	3	26	32
2010	2	7	29	33
2011	2	3	35	30

B2.2 PHOSPHATE AND POTASH USE

Annual overall rates of phosphate and potash on tillage crops and on grassland in Great Britain since 1983 are illustrated in Figure B2.4, using the data presented in Tables B2.3 and B2.4.

Figure B2.4 Overall application rates (kg/ha) phosphate and potash on tillage crops and grassland, Great Britain 1983 – 2011



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 1988-92, 53 kg/ha in 1993-97, 46 kg/ha in 1998-2002, 38 kg/ha in 2003-07 and 30 kg/ha in 2007-11. The dip in use in 2009 was caused by a major price increase for the nutrient. The 2011 rate of 30 kg/ha is the same as reported for 2010, but this rate was the second lowest recorded since Great Britain records began. It is of note that in Scotland the phosphate application rates on tillage land have largely been maintained, relative to the decline seen in England and Wales.

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 9 kg/ha in 2011, again the lowest since 1983. The five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-92, 23 kg/ha in 1993-97, 20 kg/ha in 1998-02, 16 kg/ha in 2003-07 and 10 kg/ha for the period 2007-11.

Overall potash use on tillage crops declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1988-92, 62 kg/ha in 1993-97, and 57 kg/ha in 1998-02. Between 2007 and 2011, overall potash use on tillage crops averaged 40 kg/ha, the rate of 33 kg/ha in 2009 being the lowest level recorded since 1983.

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 2011. Overall potash rates were relatively stable at 31-33kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases. The substantial fall in 2009 is linked to the very high prices seen around this time.

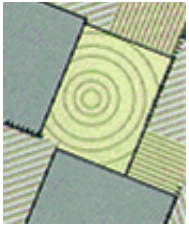


Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1969 - 2011 and Scotland and Great Britain 1983 – 2011

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1969	53	-	-	34	-	-	-	-	-
1970	56	-	-	32	-	-	-	-	-
1971	54	-	-	34	-	-	-	-	-
1972	56	-	-	34	-	-	-	-	-
1973	54	-	-	34	-	-	-	-	-
1974	51	-	-	27	-	-	39	-	-
1975	46	-	-	27	-	-	34	-	-
1976	50	-	-	29	-	-	38	-	-
1977	51	-	-	26	-	-	37	-	-
1978	49	-	-	28	-	-	39	-	-
1979	49	-	-	27	-	-	38	-	-
1980	49	-	-	27	-	-	37	-	-
1981	51	-	-	25	-	-	38	-	-
1982	55	-	-	24	-	-	39	-	-
1983	54	63	55	26	36	28	39	47	40
1984	61	68	62	25	33	26	42	48	42
1985	56	70	58	24	30	25	40	46	41
1986	56	63	57	22	27	23	40	42	40
1987	56	71	58	23	28	24	39	45	40
1988	54	65	56	21	31	23	38	45	39
1989	52	67	54	23	31	24	38	45	39
1990	51	68	53	24	28	25	38	43	39
1991	53	65	54	23	24	23	38	40	38
1992	51	67	54	19	30	22	35	43	38
1993	49	65	52	19	28	21	33	41	35
1994	51	69	53	23	28	24	37	43	38
1995	50	68	53	22	31	24	36	45	37
1996	51	65	52	22	26	23	36	40	36
1997	53	69	55	24	32	25	38	46	39
1998	49	66	51	20	27	21	34	43	35
1999	43	64	45	19	27	20	31	42	32
2000	44	60	47	18	30	20	31	42	32
2001	40	60	43	16	29	19	27	41	29
2002	41	62	44	18	26	20	29	39	31
2003	37	61	40	16	26	18	26	39	28
2004	38	63	41	15	27	17	26	41	28
2005	37	57	40	15	22	16	25	35	27
2006	33	53	35	14	22	16	23	33	25
2007	32	53	34	12	20	14	22	32	24
2008	28	50	31	9	16	10	18	29	20
2009	19	49	23	7	15	9	13	27	15
2010	27	50	30	9	16	10	18	27	19
2011	27	50	30	8	14	9	17	26	19

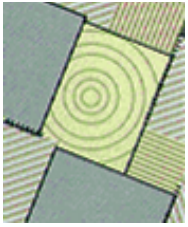
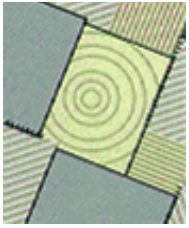


Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2011 and Scotland and Great Britain 1983 – 2011

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1969	61	-	-	23	-	-	-	-	-
1970	61	-	-	26	-	-	-	-	-
1971	59	-	-	21	-	-	-	-	-
1972	63	-	-	20	-	-	-	-	-
1973	60	-	-	22	-	-	-	-	-
1974	56	-	-	20	-	-	36	-	-
1975	51	-	-	21	-	-	34	-	-
1976	56	-	-	23	-	-	37	-	-
1977	56	-	-	23	-	-	39	-	-
1978	56	-	-	25	-	-	41	-	-
1979	53	-	-	27	-	-	40	-	-
1980	54	-	-	26	-	-	40	-	-
1981	56	-	-	26	-	-	41	-	-
1982	61	-	-	28	-	-	44	-	-
1983	60	62	60	28	36	29	44	46	43
1984	68	67	68	33	35	33	50	49	49
1985	63	67	64	32	34	32	48	47	48
1986	62	61	62	33	30	33	48	43	47
1987	63	70	64	33	31	33	48	47	48
1988	63	66	63	30	34	31	47	47	47
1989	60	73	62	34	36	34	48	51	48
1990	62	74	64	36	35	36	49	50	49
1991	62	72	63	35	31	34	49	47	49
1992	59	72	63	26	34	28	43	48	45
1993	58	72	60	27	34	29	42	47	43
1994	62	74	63	31	31	31	46	46	46
1995	59	72	61	30	34	31	44	48	45
1996	59	73	61	31	28	30	45	44	44
1997	66	74	67	35	36	35	50	50	50
1998	63	73	64	28	36	29	45	51	46
1999	55	71	57	27	32	28	41	48	42
2000	54	67	55	24	33	26	39	47	40
2001	48	72	52	23	33	24	34	49	37
2002	55	72	57	24	30	25	38	46	40
2003	51	73	54	20	31	22	34	46	36
2004	53	72	55	21	30	22	35	46	36
2005	51	66	53	19	26	20	34	40	35
2006	46	69	49	19	28	21	32	42	34
2007	44	70	47	17	23	18	30	40	32
2008	40	68	43	12	20	13	26	37	27
2009	29	64	33	10	20	12	19	36	22
2010	34	68	38	13	19	14	23	35	25
2011	35	66	39	11	16	12	23	33	25

Overall rates of phosphate and potash applied to tillage crops are more than double those used on grassland. However there is greater use of manures on grassland (35% cover) than on tillage crops (22% cover).



B2.2.1 Phosphate and potash use on major tillage crops

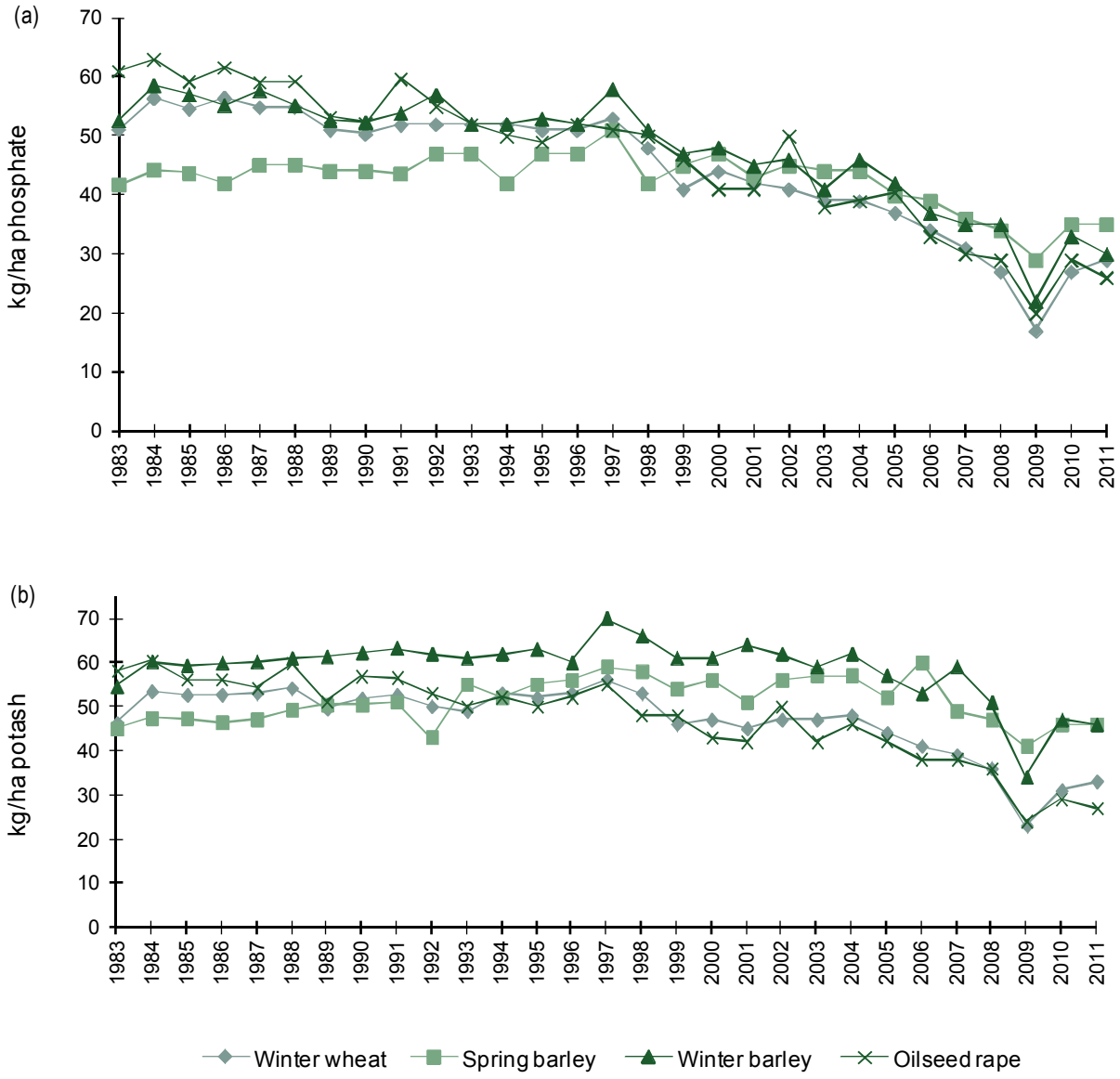
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

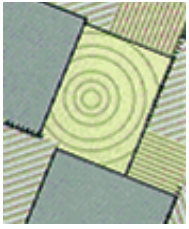
Phosphate use on most major tillage crops has shown a gradual net decline over the survey period. The net decline of phosphate on potatoes has been more dramatic, although it has stabilised in recent years. Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.5(a)); the mean for the five year period 1998-02 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). 2009 saw more marked decreases in overall rates (-10 kg/ha for winter wheat and -13 kg/ha for winter barley). 2010 saw overall phosphate rates recover (+10 kg/ha for winter wheat, and +11 kg/ha for winter barley) and these have been maintained on winter wheat in 2011. The 5 year means are 26 and 31 kg/ha for winter wheat and winter barley respectively for the 2007-11 period. Phosphate use rose slightly on spring barley between 1983 and 1997, and then declined until 2009, with an increase in overall rate of 6 kg/ha in 2010, with the same rate reported for 2011.

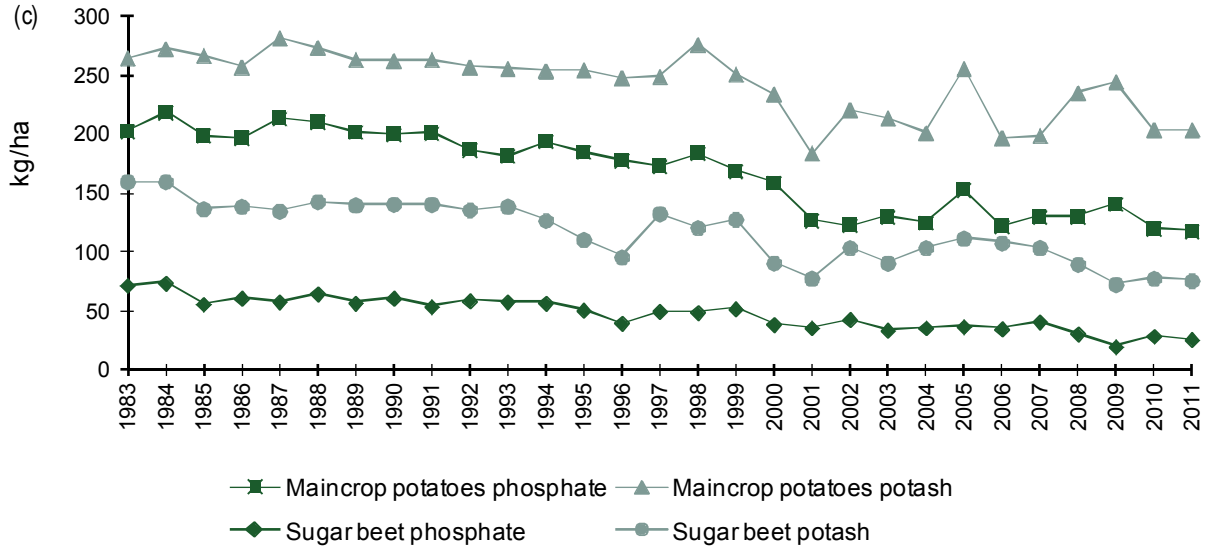
Overall phosphate use has also declined on oilseed rape, maincrop potatoes and sugar beet with means for 1983-87 of 61, 206 and 64 kg/ha, respectively declining to 46, 152 and 44 in 1998-02. Rates in general have continued to decline between 2007-11 at 27 kg/ha for oilseed rape and 29 kg/ha for sugar beet. In potatoes, the rate has fluctuated between 118 and 141 kg/ha for this period.

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 1998-02. 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 1998-02. The corresponding means for oilseed rape, maincrop potatoes and sugar beet show decreases from 57, 269 and 146 kg/ha in 1983-87 to levels of 46, 230 and 102 kg/ha for the 1998-02 period. Rates in 2007-11 indicate that the downward trend is continuing, despite the large falls in 2009, subsequent recovery in 2010 and maintenance in 2011 (five year means: 31, 217, 84 kg/ha).

Figure B2.5 **Overall application rates (kg/ha) of (a) phosphate and (b) potash on major arable crops, and (c) phosphate and potash on sugar beet and potatoes Great Britain 1983 – 2011**



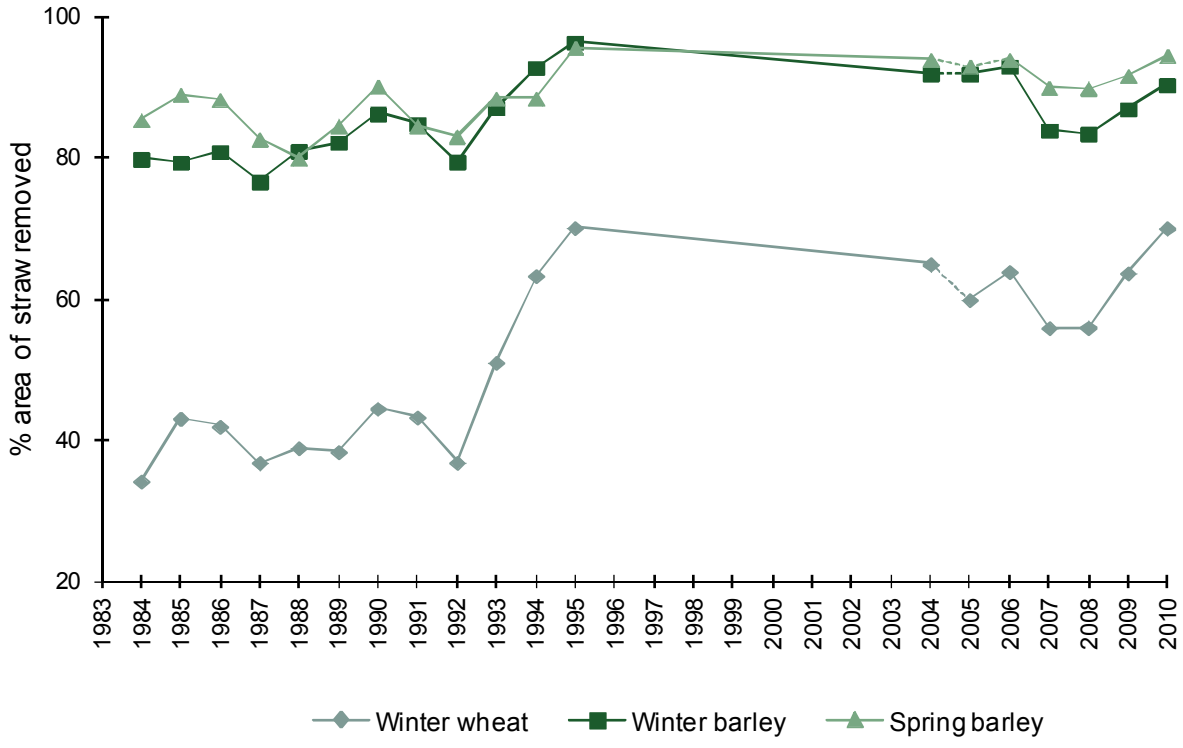


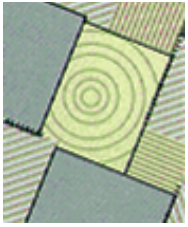


Much of the long term reduction in the overall rates of application of phosphate and potash to combinable arable crops results from a decrease in the dressing cover, as at least in 2011, average field rates have been stable.

Estimates of the percentage of straw removed from wheat and barley fields are shown in Figure B2.6 and updates and revises the Figure shown in BSFP 2010. Data collected as part of the 2011 survey will relate to the fate of the straw from the 2010 harvest so is reported against 2010.

Figure B2.6 Percentage of straw removed from wheat and barley fields, England and Wales harvest years 1985 – 1995, Great Britain harvest years 2004 - 2010





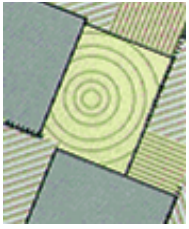
Data for the period 1984-95 were sourced from MAFF/Defra straw disposal surveys, those for the period 2004-10 from this survey. No data are available for the period 1996-03. The straw burning ban was introduced in 1993.

Quantities of nitrogen, phosphate and potash used in the UK since 1965 are shown in Table B2.5. These data are based on BSFP findings and trade and sales data. They are compiled by the Agricultural Industries Confederation in conjunction with Defra. They are considered to be the official figures for fertiliser usage.

Table B2.5 Quantities of major nutrients used, United Kingdom 1965-2011

	Nitrogen kt N				*Phosphate kt P_2O_5*				*Potash kt K_2O*			
	England & Wales	*Scotland*	*N. Ireland*	*UK*	*England & Wales*	*Scotland*	*N. Ireland*	*UK*	*England & Wales*	*Scotland*	*N. Ireland*	*UK*
1965	473	72	20	565	369	88	23	479	346	62	17	425
1966	491	76	23	590	332	81	22	435	335	61	18	413
1967	573	85	27	685	359	79	23	460	354	61	19	434
1968	625	93	29	748	367	81	21	469	362	62	18	441
1969	639	108	35	781	362	84	22	467	363	65	19	447
1970	653	108	34	796	366	81	23	470	356	63	20	438
1971	732	119	43	894	397	84	24	504	373	65	21	459
1972	751	120	48	919	371	76	24	470	336	60	19	416
1973	759	132	56	947	373	85	25	482	333	63	21	417
1974	784	139	57	980	357	72	21	449	347	55	19	421
1975	788	143	54	984	306	69	18	393	302	59	16	377
1976	851	144	65	1059	315	69	19	404	322	59	17	398
1977	879	146	68	1093	316	69	21	406	330	59	20	409
1978	924	156	75	1155	316	72	22	410	328	64	20	412
1979	941	160	85	1186	321	73	22	416	333	65	21	419
1980	1031	156	81	1268	342	75	24	440	361	65	22	447
1981	1100	159	76	1335	344	73	24	441	367	66	21	454
1982	1180	160	76	1416	357	65	24	446	394	67	22	483
1983	1227	161	82	1470	359	65	24	448	409	68	23	500
1984	1316	183	89	1588	391	69	28	488	457	73	29	559
1985	1298	186	96	1580	375	71	23	469	441	72	28	541
1986	1297	176	99	1572	341	65	28	434	415	66	29	510
1987	1370	193	111	1674	340	65	27	432	429	70	29	528
1988	1251	180	94	1525	341	70	24	435	419	76	29	524
1989	1223	193	98	1514	334	65	26	425	420	74	29	523
1990	1275	194	113	1582	323	63	28	414	409	73	33	515
1991	1224	193	98	1515	321	61	24	406	393	71	28	492
1992	1105	166	94	1365	295	55	21	371	351	64	26	441
1993	968	142	109	1219	286	50	24	360	344	57	29	430
1994	986	133	129	1248	312	51	28	391	361	59	38	458
1995	1064	156	128	1348	325	53	27	405	378	64	34	476
1996	1048	157	128	1333	302	62	30	394	370	65	36	471
1997	1156	172	112	1440	325	63	24	412	405	65	31	501
1998	1111	158	106	1375	308	56	19	383	397	64	26	487
1999	1015	152	117	1284	274	50	23	347	365	59	27	451
2000	1005	150	113	1268	237	59	21	317	322	61	26	409
2001	876	180	106	1162	201	57	21	279	274	69	26	369
2002	915	187	95	1197	209	55	19	283	397	70	24	391
2003	853	170	108	1131	203	60	19	282	283	66	26	375
2004	875	150	100	1125	205	57	16	278	288	65	22	375
2005	834	150	77	1061	192	55	12	259	267	67	18	352
2006	780	153	70	1003	173	51	11	235	243	66	16	325
2007	802	126	80	1008	169	46	9	224	241	59	17	317
2008	830	132	74	1036	160	49	6	215	244	68	13	325
2009	737	119	57	913	91	34	4	129	148	52	8	208
2010	813	127	76	1016	134	44	6	184	182	57	12	251
2011e	*830*	*125*	*74*	*1029*	*145*	*42*	*5*	*192*	*213*	*59*	*11*	*283*

Note: Years are harvest (e.g. 2011 refers to the 2010/11 cropping year) rather than calendar years. Data for 2011 are estimates.



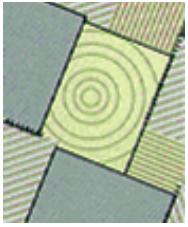
SECTION C – TABLES

CONTENTS

GREAT BRITAIN TABLES 2011

ENGLAND AND WALES TABLES 2011

Note: 1. Row percentages may not sum to exactly to 100 due to rounding.
2. No estimates are shown for crops with fewer 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 2011

Note: 1. Row percentages may not sum to exactly to 100 due to rounding.
2. No estimates are shown for crops with fewer 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 2011

	Crop area receiving dressing (%)					Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	SO_3	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	83	37	29	23	24	117	48	49	98	18	14	62
Winter wheat	99	46	44	46	17	196	62	75	193	29	33	1762
Spring barley	96	67	70	40	30	106	51	65	101	35	46	771
Winter barley	99	57	62	46	21	143	53	74	142	30	46	499
Oats	89	46	53	26	24	107	49	67	96	22	36	194
Rye/triticale/Durum wheat	31	17	39	13	51	126	53	76	39	9	30	16
Potatoes (seed or earlies)	94	62	94	22	29	133	127	175	124	79	164	21
Potatoes (maincrop)	96	88	90	25	36	170	133	225	163	118	204	113
Sugar beet	96	43	68	23	38	93	60	112	89	26	76	132
Spring oilseed rape	92	41	39	34	17	143	56	77	132	23	30	28
Winter oilseed rape	100	45	41	71	17	199	59	65	198	27	27	585
Linseed	93	25	42	38	5	94	51	65	88	13	27	43
Forage maize	70	59	38	13	84	67	45	63	47	27	24	248
Rootcrops for stockfeed	88	67	78	19	52	94	62	81	82	41	63	72
Leafy forage crops	81	64	70	18	43	84	36	47	68	23	33	56
Arable silage/other fodder crops	47	28	34	5	35	97	39	52	45	11	18	83
Peas - human consumption	3	26	29	2	2	-	58	60	-	15	18	39
Peas - animal consumption	9	34	44	9	6	22	51	65	2	17	29	34
Beans - animal consumption	1	24	22	2	11	-	59	63	-	14	14	148
Vegetables (brassicae)	94	90	90	43	41	161	95	136	152	86	123	15
Vegetables (other)	75	57	63	20	5	109	94	108	81	54	67	74
Soft Fruit	65	36	56	0	0	46	-	121	30	-	68	14
Top Fruit	78	18	45	8	0	55	28	58	42	5	26	37
Other tillage	33	22	25	16	16	93	54	41	30	12	10	59
All tillage	92	49	50	42	22	164	60	78	150	30	39	5105
Grass under 5 years old	80	53	57	13	48	118	27	41	94	14	23	1074
Grass 5 years and over	57	38	39	5	32	85	21	25	49	8	10	2589
All grass	61	41	42	6	35	93	22	29	57	9	12	3663
All crops and grass	76	45	46	23	29	133	42	54	101	19	25	8768

Source: British Survey of Fertiliser Practice 2011

Table GB1.2 Use of straight fertiliser, Great Britain 2011

	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	74	11	1	114	86	-	85	9	-	62
Winter wheat	97	14	12	192	77	88	186	11	11	1762
Spring barley	74	5	7	93	57	71	69	3	5	771
Winter barley	94	7	12	137	68	96	129	5	11	499
Oats	79	2	9	105	63	78	84	1	7	194
Rye/triticale/Durum wheat	31	3	11	121	-	-	37	-	-	16
Potatoes (seed or earlies)	59	0	45	63	-	169	37	-	76	21
Potatoes (maincrop)	55	0	13	90	-	173	50	-	22	113
Sugar beet	91	4	30	89	73	105	81	3	32	132
Spring oilseed rape	92	7	6	131	-	-	121	-	-	28
Winter oilseed rape	99	10	11	193	64	79	190	6	9	585
Linseed	93	3	15	91	-	62	85	-	9	43
Forage maize	42	4	12	80	50	83	34	2	10	248
Rootcrops for stockfeed	24	0	12	127	-	115	31	-	14	72
Leafy forage crops	24	0	0	84	-	-	20	-	-	56
Arable silage/other fodder crops	33	1	6	104	-	-	35	-	-	83
Peas - human consumption	0	6	9	-	-	85	-	-	7	39
Peas - animal consumption	9	4	15	22	-	83	2	-	12	34
Beans - animal consumption	1	9	7	-	65	65	-	6	5	148
Vegetables (brassicae)	70	0	0	98	-	-	68	-	-	15
Vegetables (other)	48	2	10	97	-	96	46	-	10	74
Soft Fruit	29	0	20	-	-	-	-	-	-	14
Top Fruit	60	0	16	61	-	-	37	-	-	37
Other tillage	24	2	1	118	-	-	29	-	-	59
All tillage	84	9	11	162	72	89	136	7	10	5105
Grass under 5 years old	39	0	3	118	64	87	46	0	3	1074
Grass 5 years and over	26	0	1	92	48	71	23	0	0	2589
All grass	28	0	1	99	52	79	28	0	1	3663
All crops and grass	54	5	6	145	71	88	79	3	5	8768

Source: British Survey of Fertiliser Practice 2011

Table GB1.3 Use of compound fertiliser, Great Britain 2011

	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	21	27	27	59	31	42	13	8	12	62
Winter wheat	10	32	32	70	56	70	7	18	22	1762
Spring barley	55	63	64	59	51	64	32	32	41	771
Winter barley	19	51	51	67	50	67	13	25	34	499
Oats	19	44	46	62	48	64	12	21	29	194
Rye/triticale/Durum wheat	5	14	28	-	-	69	-	-	19	16
Potatoes (seed or earlies)	76	62	57	114	127	154	87	79	87	21
Potatoes (maincrop)	85	88	89	134	133	206	114	118	182	113
Sugar beet	11	39	41	75	58	110	8	23	45	132
Spring oilseed rape	21	33	33	54	48	76	11	16	25	28
Winter oilseed rape	20	36	30	39	57	60	8	20	18	585
Linseed	6	22	27	-	49	66	-	11	18	43
Forage maize	46	55	28	30	44	49	13	24	14	248
Rootcrops for stockfeed	69	67	67	75	62	73	51	41	49	72
Leafy forage crops	68	63	70	71	35	46	48	22	32	56
Arable silage/other fodder crops	20	28	28	51	39	41	10	11	11	83
Peas - human consumption	3	21	21	-	49	49	-	10	10	39
Peas - animal consumption	0	29	29	-	52	56	-	15	17	34
Beans - animal consumption	0	15	15	-	56	63	-	8	9	148
Vegetables (brassicae)	90	90	90	93	95	136	84	86	123	15
Vegetables (other)	43	55	53	82	94	110	35	52	58	74
Soft Fruit	36	36	36	-	-	-	-	-	-	14
Top Fruit	28	18	29	21	28	52	6	5	15	37
Other tillage	11	21	24	16	54	39	2	11	9	59
All tillage	22	40	39	63	57	73	14	23	29	5105
Grass under 5 years old	55	53	55	87	27	38	48	14	21	1074
Grass 5 years and over	38	38	38	67	21	25	25	8	9	2589
All grass	41	41	41	72	22	28	29	9	11	3663
All crops and grass	32	41	40	69	38	49	22	16	20	8768

Source: British Survey of Fertiliser Practice 2011

Table GB1.4 Use of lime, Great Britain 2011

	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	5.3	0.5	-	-	0.3	6.1	4.5	3.0	-	-	0.3	4.1	7	62
Winter wheat	3.5	0.9	0.6	0.3	0.2	5.5	3.6	4.0	3.5	4.5	1.0	3.6	78	1762
Spring barley	8.1	0.0	1.5	0.1	1.5	11.3	3.8	15.1	4.4	5.5	1.9	3.7	109	771
Winter barley	6.2	0.9	0.5	-	1.1	8.7	4.6	4.5	3.8	-	16.1	6.0	41	499
Oats	3.2	0.8	0.6	-	1.0	5.6	4.1	5.2	5.8	-	0.3	3.8	14	194
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	2	16
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	21
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	113
Sugar beet	4.3	1.4	-	18.3	-	24.0	5.6	4.0	-	6.2	-	5.9	27	132
Spring oilseed rape	15.3	0.9	-	-	-	16.2	3.1	4.9	-	-	-	3.2	5	28
Winter oilseed rape	7.1	2.0	0.3	0.2	0.4	10.0	4.5	5.1	6.1	5.0	3.6	4.7	61	585
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	3	43
Forage maize	8.2	4.8	-	0.2	3.3	16.5	4.4	3.9	-	10.0	3.7	4.2	37	248
Rootcrops for stockfeed	16.9	-	5.6	-	3.1	25.5	4.5	-	4.7	-	4.5	4.6	17	72
Leafy forage crops	7.9	1.1	3.5	-	6.0	18.4	4.1	7.5	4.6	-	1.4	3.5	13	56
Arable silage/other fodder crops	9.2	1.4	0.8	-	0.3	11.7	4.1	4.0	5.6	-	2.5	4.1	15	83
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	39
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	34
Beans - animal consumption	3.0	-	-	-	0.4	3.3	5.0	-	-	-	1.8	4.6	6	148
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	4	15
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	4	74
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	14
Top Fruit	-	0.3	-	-	13.5	13.8	-	1.5	-	-	1.1	1.1	5	37
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	1	59
All tillage	5.2	1.0	0.7	0.7	0.8	8.4	4.1	4.4	4.3	5.8	3.9	4.3	452	5105
Grass under 5 years old	3.2	0.4	0.6	0.0	0.8	5.1	4.6	5.1	5.0	5.0	3.9	4.6	88	1074
Grass 5 years and over	2.6	0.1	0.4	0.1	0.6	3.9	4.6	4.5	4.6	3.8	3.0	4.3	154	2589
All grass	2.7	0.1	0.5	0.1	0.7	4.1	4.6	4.8	4.7	3.9	3.2	4.4	242	3663
All crops and grass	3.9	0.6	0.6	0.4	0.7	6.1	4.3	4.5	4.5	5.5	3.5	4.3	694	8768

Source: British Survey of Fertiliser Practice 2011

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2011

	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	53	36	36	21	76	18	21	40	7	7	1696
Grazed mown	71	46	47	54	109	26	37	77	12	17	1414
All grazings	59	39	40	32	89	21	27	52	8	11	3110
Cut for silage - grazed	80	52	55	65	119	27	39	95	14	21	1032
Cut for silage - not grazed	89	64	69	65	125	29	43	111	19	30	391
All cut for silage	82	55	59	65	121	28	41	99	15	24	1423
Cut for hay - grazed	52	31	31	25	68	20	23	35	6	7	427
Cut for hay - not grazed	71	44	51	31	77	28	42	55	12	21	133
All cut for hay	55	33	34	26	70	21	27	39	7	9	560
All mowings	75	49	52	55	112	27	38	83	13	20	1922
All grass	61	41	42	35	93	22	29	57	9	12	3663

Source: British Survey of Fertiliser Practice 2011

Table GB3.0 Product use by month of application, Great Britain 2011

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	6	35	38	14	3	2	1
Straight P	12	14	3	1	1	8	34	13	3	0	1	10
Straight K	3	6	9	6	8	11	36	17	2	1	0	1
Compounds	6	4	1	1	1	4	26	35	12	5	3	4
All fertilisers	3	2	1	0	1	5	32	36	13	4	2	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	4	33	39	15	4	2	1
Phosphate	9	8	2	1	1	6	28	28	8	2	1	6
Potash	7	6	2	1	2	7	31	28	8	3	2	3
Total	3	2	1	0	1	5	32	36	13	4	2	2

Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2011.

'Nutrient' 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 (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B.

Source: British Survey of Fertiliser Practice 2011

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2011

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 specified	all grass	all crops and grass
Ammonium Nitrate	35.3	47.8	7.5	22.7	48.3	25.4	41.4	31.6	30.3	28.0	35.5	30.6	38.6
Urea	3.8	10.8	0.4	1.7	12.5	2.5	8.5	3.8	4.7	3.9	4.4	4.0	7.4
Calcium Ammonium Nitrate (CAN)	2.8	2.3	0.2	0.3	2.1	2.1	2.2	3.1	2.2	2.8	1.6	2.7	2.3
Urea Ammonium Nitrate (UAN)	5.7	11.3	1.4	5.8	11.0	2.2	9.0	2.1	1.4	2.3	0.9	1.9	7.2
Other Straight N	1.3	2.2	4.5	0.1	5.5	1.5	2.6	1.9	2.1	1.4	0.0	1.5	2.3
Triple Superphosphate (TSP)	1.1	2.3	0.0	0.8	1.8	1.9	1.8	0.2	0.4	0.3	0.5	0.2	1.4
Other Straight P	0.1	0.2	0.0	0.0	0.1	0.3	0.2	0.1	0.0	0.0	0.6	0.1	0.1
Muriate of Potash (MOP)	1.9	2.8	4.5	1.3	2.4	4.9	2.8	0.5	1.5	0.9	3.9	0.8	2.3
Other Straight K	0.3	0.1	0.4	29.6	0.2	2.2	1.3	0.3	0.0	0.3	0.0	0.2	1.1
PK	8.8	11.2	3.8	21.8	7.1	15.6	10.5	2.4	3.0	2.2	0.0	2.2	8.4
NK	1.2	0.8	4.7	6.3	0.9	1.5	1.3	5.0	2.3	6.6	9.1	4.9	2.3
Low N (<19% N)	20.9	3.9	68.5	7.2	6.8	26.4	12.1	4.0	6.4	3.5	7.9	4.4	10.1
High N (>=19% N)	16.7	4.2	3.8	0.4	0.9	13.1	6.1	45.1	45.4	47.9	35.5	46.5	16.3
Other	0.0	0.1	0.2	1.9	0.4	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.2
Total product ('000 tonnes)	**358**	**1623**	**106**	**98**	**502**	**133**	**2822**	**929**	**87**	**582**	**15**	**1133**	**3955**

Source: British Survey of Fertiliser Practice 2011

Table GB3.2 Use of product type by crop group, Great Britain 2011

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 specified	all grass	total product ('000 tonnes)
Ammonium Nitrate	10.2	64.9	0.8	1.8	19.3	3.0	78.4	84.2	8.6	49.4	1.6	21.6	1489
Urea	5.5	66.6	0.2	0.4	26.2	1.1	88.6	80.0	13.3	50.1	2.5	11.4	358
Calcium Ammonium Nitrate (CAN)	17.7	60.8	0.3	0.7	14.6	5.9	62.3	94.8	4.3	41.2	0.5	37.7	105
Urea Ammonium Nitrate (UAN)	8.5	66.4	0.4	2.7	20.7	1.3	95.9	82.9	3.8	69.2	3.2	4.1	324
Other Straight N	4.8	46.4	9.7	0.1	37.9	1.2	84.1	99.5	4.0	50.5	0.0	15.9	82
Triple Superphosphate (TSP)	7.6	71.9	0.0	1.4	14.7	4.3	96.1	72.8	7.2	53.7	2.8	3.9	65
Other Straight P	7.3	77.4	0.0	0.0	9.3	5.9	88.5	89.8	0.0	0.0	10.2	11.5	7
Muriate of Potash (MOP)	7.9	62.2	5.6	1.6	13.5	9.2	92.3	44.6	18.9	70.1	8.2	7.7	75
Other Straight K	4.2	6.1	1.2	77.5	4.3	6.6	87.7	100.0	0.0	49.4	0.0	12.3	36
PK	9.3	59.4	1.1	9.6	11.4	9.1	93.5	91.1	8.1	45.0	0.0	6.5	312
NK	25.1	36.1	10.8	9.1	11.4	7.5	37.3	76.6	2.2	78.4	1.4	62.7	80
Low N (<19% N)	31.6	17.5	26.5	2.1	10.9	11.5	89.2	74.5	13.1	45.1	3.1	10.8	316
High N (>=19% N)	39.6	42.3	2.5	0.6	3.8	11.1	16.3	80.5	7.3	51.0	1.0	83.7	700
Other	3.2	11.6	8.1	37.4	33.9	5.8	95.9	74.7	25.3	74.7	0.0	4.1	6
All Fertilisers	**12.7**	**57.5**	**3.8**	**3.5**	**17.8**	**4.7**	**71.3**	**82.0**	**7.7**	**51.4**	**1.3**	**28.7**	**3955**

Source: British Survey of Fertiliser Practice 2011

Table GB3.3 Product use by month of application, Great Britain 2011

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	3.9	33.4	40.0	15.6	3.3	2.3	0.7	0.6	0.1	0.1	0.0	1489
Urea	0.0	11.1	42.1	28.7	10.0	5.1	1.9	0.4	0.4	0.2	0.1	0.0	358
Calcium Ammonium Nitrate (CAN)	0.0	3.6	29.1	36.4	19.0	5.3	4.2	1.9	0.4	0.0	0.0	0.0	105
Urea Ammonium Nitrate (UAN)	0.0	6.4	36.3	42.0	12.8	1.6	0.1	0.6	0.2	0.0	0.0	0.0	324
Other Straight N	0.0	13.5	41.7	32.5	6.3	5.6	0.1	0.3	0.2	0.0	0.0	0.0	82
Triple Superphosphate (TSP)	1.1	9.5	34.5	12.4	3.7	0.0	0.7	8.8	10.3	14.6	3.0	1.4	65
Other Straight P	0.0	0.0	32.1	13.2	0.0	2.4	0.0	20.5	23.1	4.0	4.6	0.0	7
Muriate of Potash (MOP)	4.1	14.2	42.6	20.5	2.6	0.5	0.3	1.0	3.0	4.5	4.2	2.8	75
Other Straight K	15.6	2.5	21.1	10.4	0.9	2.8	0.0	1.5	4.0	10.1	20.1	11.0	36
PK	4.1	9.8	24.5	11.5	2.0	0.1	0.1	7.0	21.7	13.7	3.5	2.2	312
NK	0.0	0.8	22.5	19.2	23.3	16.6	9.9	2.5	1.3	2.0	1.2	0.6	80
Low N (<19% N)	0.6	3.0	34.6	42.1	9.2	0.9	0.2	3.7	2.9	2.2	0.5	0.0	316
High N (>=19% N)	0.0	1.2	23.3	44.1	15.8	7.9	4.7	2.2	0.6	0.1	0.0	0.0	700
Other	0.0	12.8	46.8	18.4	2.7	0.0	1.0	3.0	0.0	5.6	9.6	0.0	6
All Fertilisers	**0.6**	**5.1**	**32.0**	**35.9**	**12.7**	**3.9**	**2.2**	**1.9**	**2.7**	**1.8**	**0.7**	**0.4**	**3955**

Source: British Survey of Fertiliser Practice 2011

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2011

	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	87	20	19	16	127	52	79	110	10	15	18
Winter wheat	100	51	43	14	207	65	74	206	33	32	735
Spring barley	98	70	70	22	118	53	67	115	38	47	177
Winter barley	100	62	68	11	152	61	84	152	38	57	123
Oats	86	40	45	19	109	53	82	94	21	36	56
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	100	100	100	30	157	135	273	157	135	273	11
Sugar beet	98	63	64	18	100	60	122	98	38	78	30
Spring oilseed rape	89	43	30	0	169	70	-	150	30	-	12
Winter oilseed rape	100	44	40	13	203	59	62	203	26	25	286
Linseed	97	28	44	6	95	51	69	92	14	30	29
Forage maize	76	44	40	69	106	60	91	81	26	37	17
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	3
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	0	6	6	0	-	-	-	-	-	-	5
Peas - human consumption	0	35	36	0	-	-	84	-	-	30	9
Peas - animal consumption	14	47	52	2	22	51	62	3	24	33	21
Beans - animal consumption	0	28	25	9	-	59	58	-	17	15	77
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	3	38	23	0	-	-	-	-	-	-	7
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	34	28	23	17	108	-	-	37	-	-	14
All tillage	93	50	46	14	186	62	74	173	31	34	1640
Grass under 5 years old	66	26	31	12	110	30	52	73	8	16	107
Grass 5 years and over	44	15	16	4	76	27	30	34	4	5	251
All grass	51	18	21	6	90	28	40	46	5	8	358
All crops and grass	87	46	43	13	178	60	72	156	28	31	1998

The data in this table apply to farms in the 'cereals' robust group, as detailed in Appendix 3.

Source: British Survey of Fertiliser Practice 2011

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2011

	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	71	46	11	19	99	74	-	71	34	-	14
Winter wheat	98	39	44	6	183	64	81	179	25	35	467
Spring barley	97	65	69	12	105	54	73	102	35	50	203
Winter barley	100	58	63	10	138	47	70	138	27	44	122
Oats	98	42	62	12	118	60	75	115	26	46	33
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	91	67	91	20	134	127	182	122	85	166	15
Potatoes (maincrop)	95	87	89	31	174	130	219	165	113	196	86
Sugar beet	95	41	71	34	94	64	113	89	26	80	87
Spring oilseed rape	100	27	27	18	114	-	-	114	-	-	6
Winter oilseed rape	100	49	44	14	197	59	64	197	29	28	158
Linseed	82	19	29	0	92	-	-	75	-	-	9
Forage maize	100	71	33	52	82	42	44	82	30	14	15
Rootcrops for stockfeed	93	66	67	31	151	85	108	140	56	73	8
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/other fodder crops	48	2	24	2	128	-	-	61	-	-	11
Peas - human consumption	4	20	24	3	-	51	55	-	10	13	26
Peas - animal consumption	0	0	15	20	-	-	-	-	-	-	10
Beans - animal consumption	0	14	10	2	-	58	70	-	8	7	33
Vegetables (brassicae)	92	92	92	22	183	89	144	169	82	133	9
Vegetables (other)	87	60	69	4	109	98	111	94	59	76	55
Soft Fruit	61	39	61	0	50	-	121	31	-	74	12
Top Fruit	77	19	44	0	56	28	58	43	5	25	35
Other tillage	36	21	29	9	86	42	41	32	9	12	32
All tillage	91	48	53	12	150	66	92	137	31	49	1454
Grass under 5 years old	80	41	35	31	97	21	38	78	9	13	93
Grass 5 years and over	46	28	29	11	79	24	30	36	7	9	198
All grass	53	31	31	16	85	23	32	46	7	10	291
All crops and grass	84	44	49	13	142	60	84	119	27	41	1745

The data in this table apply to farms in the 'general cropping' and 'horticulture' robust groups, as detailed in Appendix 3.

Source: British Survey of Fertiliser Practice 2011

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2011

	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	71	44	44	77	90	18	20	63	8	9	14
Winter wheat	97	18	22	44	184	45	69	178	8	15	112
Spring barley	85	61	70	77	95	43	50	81	26	35	67
Winter barley	97	53	57	47	128	48	63	124	25	36	45
Oats	96	25	34	38	108	-	-	103	-	-	9
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	1
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	32	32	12	189	52	68	189	16	22	15
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	64	60	38	91	63	45	62	40	27	24	136
Rootcrops for stockfeed	55	46	46	100	-	-	-	-	-	-	7
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	65	40	38	68	93	34	33	60	13	12	32
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	0	10	10	23	-	-	-	-	-	-	9
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	1
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	4
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	80	43	39	65	126	44	58	100	19	23	459
Grass under 5 years old	89	48	56	80	150	27	49	133	13	27	260
Grass 5 years and over	83	47	49	61	131	24	31	109	12	15	469
All grass	85	48	51	67	136	25	37	116	12	19	729
All crops and grass	84	47	48	66	134	29	40	113	13	20	1188

The data in this table apply to farms in the 'dairy' robust group, as detailed in Appendix 3.

Source: British Survey of Fertiliser Practice 2011

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2011

	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	50	50	13	71	-	-	71	-	-	6
Winter wheat	95	49	44	27	173	54	54	165	26	24	90
Spring barley	91	75	84	63	78	43	47	71	32	39	147
Winter barley	93	75	78	59	125	50	56	117	38	44	63
Oats	78	70	69	47	90	36	40	70	25	28	48
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	38	38	5	151	-	-	151	-	-	10
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	45	44	46	81	46	39	63	21	17	29	33
Rootcrops for stockfeed	89	66	83	61	68	59	61	60	39	50	36
Leafy forage crops	86	69	78	46	78	32	34	67	22	26	43
Arable silage/other fodder crops	24	26	26	48	58	48	46	14	12	12	22
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	2
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	83	61	64	51	112	46	50	93	28	32	512
Grass under 5 years old	76	63	67	52	95	26	35	73	16	23	427
Grass 5 years and over	52	40	40	31	69	19	23	36	8	9	1391
All grass	55	43	43	34	73	20	25	40	9	11	1818
All crops and grass	57	44	45	35	77	23	28	44	10	12	2330

The data in this table apply to farms in the 'LFA grazing livestock' and 'lowland grazing livestock' robust groups, as detailed in Appendix 3.

Source: British Survey of Fertiliser Practice 2011

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2011

	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	65	65	4	169	38	43	169	25	28	9
Winter wheat	99	48	55	36	185	55	76	183	27	42	326
Spring barley	97	67	68	42	104	51	66	102	34	45	168
Winter barley	100	51	55	29	148	53	74	148	27	41	131
Oats	96	47	60	29	104	50	61	100	23	36	48
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	1
Potatoes (maincrop)	99	91	91	83	152	158	216	151	143	196	14
Sugar beet	100	38	72	88	67	-	115	67	-	83	8
Spring oilseed rape	100	42	65	51	109	-	63	109	-	41	8
Winter oilseed rape	99	47	49	38	181	60	80	180	28	39	98
Linseed	-	-	-	-	-	-	-	-	-	-	4
Forage maize	88	65	34	98	53	46	62	47	30	21	47
Rootcrops for stockfeed	90	61	87	66	102	66	119	92	40	104	17
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/other fodder crops	77	74	81	21	88	33	42	68	25	34	13
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	4	23	29	25	-	66	76	-	15	22	20
Vegetables (brassicae)	99	83	83	84	-	-	-	-	-	-	5
Vegetables (other)	32	32	32	89	-	-	-	-	-	-	6
Soft Fruit	-	-	-	-	-	-	-	-	-	-	1
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	4	0	0	37	-	-	-	-	-	-	10
All tillage	96	52	57	39	154	56	76	148	29	43	947
Grass under 5 years old	82	63	66	15	122	29	41	99	18	27	185
Grass 5 years and over	60	28	29	12	85	24	29	51	7	8	271
All grass	67	39	40	13	99	26	35	66	10	14	456
All crops and grass	83	46	50	27	135	45	62	112	21	31	1403

The data in this table apply to farms in the 'mixed' robust group, as detailed in Appendix 3.

Source: British Survey of Fertiliser Practice 2011

Table EW1.1 Total fertiliser use, England & Wales 2011

	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	86	36	27	18	118	50	53	101	18	14	57
Winter wheat	99	45	43	16	196	62	74	193	28	32	1647
Spring barley	94	45	50	23	107	47	60	101	21	30	488
Winter barley	99	55	61	19	140	51	73	139	28	44	450
Oats	90	41	49	23	109	45	68	99	19	33	151
Rye/triticale/Durum wheat	30	15	39	53	123	-	76	37	-	29	14
Potatoes (seed or earlies)	90	39	90	47	131	109	193	117	42	173	14
Potatoes (maincrop)	95	86	89	41	168	133	228	160	114	202	94
Sugar beet	96	43	68	38	93	60	112	89	26	76	132
Spring oilseed rape	92	37	35	18	145	56	81	133	21	29	25
Winter oilseed rape	100	44	40	16	199	60	66	199	26	26	547
Linseed	93	25	42	5	94	51	65	88	13	27	43
Forage maize	72	59	37	84	67	46	64	48	27	24	239
Rootcrops for stockfeed	84	55	71	50	95	50	73	80	28	52	51
Leafy forage crops	81	69	78	33	79	33	47	64	23	37	40
Arable silage/other fodder crops	41	21	27	33	104	37	57	42	8	15	72
Vining peas (for human consumption)	4	34	38	3	-	58	60	-	20	23	30
Field peas (harvested dry)	9	34	44	6	22	51	65	2	17	29	34
Field beans (harvested dry)	1	24	22	11	-	59	64	-	14	14	144
Vegetables (brassicae)	90	82	82	53	140	101	128	126	83	105	13
Vegetable Other	73	53	59	2	111	84	98	81	44	58	64
Soft Fruit	91	50	79	0	46	-	121	42	-	95	12
Top Fruit	78	18	45	0	55	28	58	42	5	26	37
Other tillage	33	22	25	16	93	54	41	30	12	10	59
All tillage	91	45	46	21	168	60	78	154	27	35	4457
Grass less than five years old	76	41	48	51	126	26	43	96	11	20	802
Grass five years and over	56	35	36	34	88	21	26	49	7	10	2192
All grass	59	36	38	37	96	22	30	57	8	11	2994
All crops and grass	75	41	42	29	140	43	56	105	17	23	7451

Source: British Survey of Fertiliser Practice 2011

Table EW1.2 Use of straight fertiliser, England & Wales 2011

	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	80	12	1	115	86	-	92	10	-	57
Winter wheat	97	14	12	193	76	87	187	11	10	1647
Spring barley	81	8	10	106	53	68	85	4	6	488
Winter barley	94	6	12	135	73	97	127	4	11	450
Oats	84	2	8	107	61	85	90	1	7	151
Rye/triticale/Durum wheat	30	3	12	121	-	-	36	-	-	14
Potatoes (seed or earlies)	77	0	50	57	-	174	44	-	87	14
Potatoes (maincrop)	55	0	13	90	-	167	49	-	22	94
Sugar beet	91	4	30	89	73	105	81	3	32	132
Spring oilseed rape	92	8	6	133	-	-	122	-	-	25
Winter oilseed rape	99	10	11	193	64	81	191	6	9	547
Linseed	93	3	15	91	-	62	85	-	9	43
Forage maize	43	5	13	80	50	83	34	2	11	239
Rootcrops for stockfeed	31	0	17	130	-	115	40	-	19	51
Leafy forage crops	16	1	1	71	-	-	11	-	-	40
Arable silage/other fodder crops	31	1	7	114	-	-	35	-	-	72
Peas - human consumption	0	7	11	-	-	85	-	-	10	30
Peas - animal consumption	9	4	15	22	-	83	2	-	12	34
Beans - animal consumption	1	9	8	-	65	65	-	6	5	144
Vegetables (brassicae)	47	0	0	109	-	-	51	-	-	13
Vegetables (other)	54	3	11	98	-	-	53	-	-	64
Soft Fruit	41	0	29	-	-	-	-	-	-	12
Top Fruit	60	0	16	61	-	-	37	-	-	37
Other tillage	24	2	1	118	-	-	29	-	-	59
All tillage	86	10	12	167	72	89	143	7	10	4457
Grass under 5 years old	46	1	4	126	65	80	58	0	3	802
Grass 5 years and over	27	0	1	93	48	71	25	0	1	2192
All grass	30	0	1	101	52	75	30	0	1	2994
All crops and grass	58	5	7	150	71	88	87	4	6	7451

Source: British Survey of Fertiliser Practice 2011

Table EW1.3 Use of compound fertiliser, England & Wales 2011

	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	19	26	26	51	32	45	10	8	11	57
Winter wheat	9	31	31	70	55	68	7	17	21	1647
Spring barley	25	38	40	63	45	58	16	17	23	488
Winter barley	17	49	50	71	48	66	12	24	33	450
Oats	14	40	42	68	43	64	9	17	27	151
Rye/triticale/Durum wheat	3	12	27	-	-	-	-	-	-	14
Potatoes (seed or earlies)	61	39	53	119	109	163	73	42	86	14
Potatoes (maincrop)	82	86	88	135	133	204	110	114	180	94
Sugar beet	11	39	41	75	58	110	8	23	45	132
Spring oilseed rape	15	29	29	-	46	81	-	13	23	25
Winter oilseed rape	19	35	29	39	58	60	7	20	18	547
Linseed	6	22	27	-	49	66	-	11	18	43
Forage maize	47	55	27	29	45	50	14	25	13	239
Rootcrops for stockfeed	58	55	56	68	50	58	40	28	32	51
Leafy forage crops	74	68	77	71	33	47	53	22	36	40
Arable silage/other fodder crops	12	20	20	56	36	42	7	7	8	72
Peas - human consumption	4	27	27	-	49	49	-	13	13	30
Peas - animal consumption	0	29	29	-	52	56	-	15	17	34
Beans - animal consumption	0	15	15	-	55	63	-	8	9	144
Vegetables (brassicae)	82	82	82	91	101	128	75	83	105	13
Vegetables (other)	36	50	48	77	83	101	28	42	48	64
Soft Fruit	50	50	50	-	-	-	-	-	-	12
Top Fruit	28	18	29	21	28	52	6	5	15	37
Other tillage	11	21	24	16	54	39	2	11	9	59
All tillage	16	35	34	64	56	72	10	20	25	4457
Grass under 5 years old	44	40	45	87	25	39	38	10	17	802
Grass 5 years and over	35	35	35	68	20	25	24	7	9	2192
All grass	37	36	37	72	21	28	26	8	10	2994
All crops and grass	26	36	36	69	38	49	18	14	18	7451

Source: British Survey of Fertiliser Practice 2011

Table EW1.4 Use of lime, England & Wales 2011

	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	3.2	0.5	-	-	-	3.7	4.0	3.0	-	-	-	3.9	5	57
Winter wheat	3.5	1.0	0.3	0.3	0.2	5.4	3.6	4.0	2.1	4.5	1.0	3.5	70	1647
Spring barley	4.2	0.1	1.1	0.2	0.5	6.1	4.4	15.1	4.8	5.5	4.3	4.6	48	488
Winter barley	6.2	1.0	0.6	-	1.1	8.9	4.6	4.5	3.8	-	17.8	6.2	37	450
Oats	3.7	1.1	-	-	0.9	5.7	4.1	5.2	-	-	0.3	3.7	9	151
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	2	14
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	14
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	94
Sugar beet	4.3	1.4	-	18.3	-	24.0	5.6	4.0	-	6.2	-	5.9	27	132
Spring oilseed rape	16.3	0.9	-	-	-	17.3	3.1	4.9	-	-	-	3.2	5	25
Winter oilseed rape	6.8	2.1	0.2	0.2	0.4	9.8	4.7	5.1	4.5	5.0	3.6	4.7	54	547
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	3	43
Forage maize	7.5	5.0	-	0.2	3.3	16.0	4.6	3.9	-	10.0	3.9	4.3	34	239
Rootcrops for stockfeed	14.2	-	4.3	-	4.1	22.6	4.3	-	4.5	-	4.5	4.3	11	51
Leafy forage crops	9.8	1.6	4.9	-	6.6	22.9	3.9	7.5	4.6	-	1.6	3.6	11	40
Arable silage/other fodder crops	7.8	1.6	-	-	-	9.4	4.5	4.0	-	-	-	4.4	10	72
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	1	30
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	34
Beans - animal consumption	3.0	-	-	-	0.4	3.4	5.0	-	-	-	1.8	4.6	6	144
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	4	13
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	4	64
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	12
Top Fruit	-	0.3	-	-	13.5	13.8	-	1.5	-	-	1.1	1.1	5	37
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	1	59
All tillage	4.6	1.2	0.4	0.8	0.6	7.6	4.2	4.4	3.5	5.8	4.8	4.4	347	4457
Grass under 5 years old	2.2	0.5	0.5	0.1	1.0	4.3	4.9	5.1	5.0	5.0	3.9	4.7	61	802
Grass 5 years and over	2.7	0.1	0.5	0.2	0.8	4.2	4.7	4.5	4.6	3.8	2.9	4.3	132	2192
All grass	2.6	0.2	0.5	0.1	0.8	4.2	4.8	4.8	4.7	3.9	3.1	4.4	193	2994
All crops and grass	3.6	0.7	0.4	0.5	0.7	5.9	4.4	4.5	4.1	5.5	3.9	4.4	540	7451

Source: British Survey of Fertiliser Practice 2011

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	14	0	7	13	11	16	12	15	6	6	-	-	-	-	-	-	-	-	57
Winter wheat	1	0	1	2	2	3	6	17	21	22	12	8	3	1	1	-	-	-	1647
Spring barley	6	1	5	11	20	27	18	7	4	-	-	-	-	-	-	-	-	-	488
Winter barley	1	0	3	4	5	16	29	23	14	3	1	-	-	-	-	-	-	-	450
Oats	10	0	5	4	23	31	21	6	1	1	1	-	-	-	-	-	-	-	151
Rye/triticale/Durum wheat	70	0	0	0	0	18	10	3	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	10	0	3	28	2	0	8	27	15	7	-	-	-	-	-	-	-	-	14
Potatoes (maincrop)	5	0	0	2	5	14	11	22	8	22	9	0	3	-	-	-	-	-	94
Sugar beet	4	1	16	16	13	30	18	2	-	-	-	-	-	-	-	-	-	-	132
Spring oilseed rape	8	0	0	11	14	4	11	15	19	16	0	1	-	-	-	-	-	-	25
Winter oilseed rape	0	1	1	3	1	2	4	11	20	29	18	8	3	-	-	-	-	-	547
Linseed	7	0	1	16	42	30	5	-	-	-	-	-	-	-	-	-	-	-	43
Forage maize	28	15	13	16	10	9	7	2	-	-	-	-	-	-	-	-	-	-	239
Rootcrops for stockfeed	16	3	19	20	5	11	11	4	6	0	5	-	-	-	-	-	-	-	51
Leafy forage crops	19	3	20	17	16	13	5	8	-	-	-	-	-	-	-	-	-	-	40
Arable silage/other fodder crops	59	3	1	8	1	6	17	4	-	-	-	-	-	-	-	-	-	-	72
Peas - human consumption	96	0	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Peas - animal consumption	91	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
Beans - animal consumption	99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144
Vegetables (brassicae)	10	0	4	0	0	47	5	20	0	13	1	-	-	-	-	-	-	-	13
Vegetables (other)	27	1	1	6	24	30	0	9	2	-	-	-	-	-	-	-	-	-	64
Soft Fruit	9	12	49	29	0	2	-	-	-	-	-	-	-	-	-	-	-	-	12
Top Fruit	22	21	25	5	11	7	8	1	-	-	-	-	-	-	-	-	-	-	37
Other tillage	67	7	1	2	6	10	3	1	2	-	-	-	-	-	-	-	-	-	59
All tillage	9	1	3	5	5	9	10	13	14	15	9	5	2	1	1	-	-	-	4457
Grass under 5 years old	24	1	11	12	10	8	10	7	4	5	3	3	2	1	0	1	-	-	802
Grass 5 years and over	44	1	15	14	9	5	5	3	2	1	1	-	-	-	-	-	-	-	2192
All grass	41	1	14	13	9	5	6	4	2	2	1	1	-	-	-	-	-	-	2994
All crops and grass	25	1	8	9	7	7	8	8	8	8	5	3	1	-	-	-	-	-	7451

Source: British Survey of Fertiliser Practice 2011

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	64	9	10	8	10	-	-	-	-	-	-	-	-	-	-	-	-	-	57
Winter wheat	55	3	9	18	11	2	-	-	-	-	-	-	-	-	-	-	-	-	1647
Spring barley	55	7	17	16	4	1	-	-	-	-	-	-	-	-	-	-	-	-	488
Winter barley	45	8	15	22	9	-	-	-	-	-	-	-	-	-	-	-	-	-	450
Oats	59	8	14	15	5	-	-	-	-	-	-	-	-	-	-	-	-	-	151
Rye/triticale/Durum wheat	85	0	3	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	61	0	0	0	17	10	10	0	1	-	-	-	-	-	-	-	-	-	14
Potatoes (maincrop)	14	0	5	3	16	21	11	14	3	0	5	8	-	-	-	-	-	-	94
Sugar beet	57	3	22	9	6	0	2	0	0	0	0	0	0	0	0	0	0	1*	132
Spring oilseed rape	63	13	0	9	15	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Winter oilseed rape	56	4	11	18	8	1	2	-	-	-	-	-	-	-	-	-	-	-	547
Linseed	75	0	11	12	3	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Forage maize	41	17	15	20	5	0	2	-	-	-	-	-	-	-	-	-	-	-	239
Rootcrops for stockfeed	45	8	20	17	9	1	-	-	-	-	-	-	-	-	-	-	-	-	51
Leafy forage crops	31	33	28	3	0	5	-	-	-	-	-	-	-	-	-	-	-	-	40
Arable silage/other fodder crops	79	8	7	4	0	0	1	-	-	-	-	-	-	-	-	-	-	-	72
Peas - human consumption	66	0	7	23	0	4	-	-	-	-	-	-	-	-	-	-	-	-	30
Peas - animal consumption	66	2	17	11	4	-	-	-	-	-	-	-	-	-	-	-	-	-	34
Beans - animal consumption	76	1	7	9	6	1	-	-	-	-	-	-	-	-	-	-	-	-	144
Vegetables (brassicae)	18	0	0	17	14	52	-	-	-	-	-	-	-	-	-	-	-	-	13
Vegetables (other)	47	5	5	16	4	3	19	-	-	-	-	-	-	-	-	-	-	-	64
Soft Fruit	50	0	49	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Top Fruit	82	13	0	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Other tillage	78	5	2	8	7	-	-	-	-	-	-	-	-	-	-	-	-	-	59
All tillage	55	5	11	17	9	2	1	-	-	-	-	-	-	-	-	-	-	-	4457
Grass under 5 years old	59	24	13	3	0	1	-	-	-	-	-	-	-	-	-	-	-	-	802
Grass 5 years and over	65	25	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2192
All grass	64	24	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2994
All crops and grass	59	15	10	9	5	1	-	-	-	-	-	-	-	-	-	-	-	-	7451

* This value represents one instance, where a high phosphate application was made to correct a serious nutrient deficiency.

Source: British Survey of Fertiliser Practice 2011

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	73	9	7	2	7	1	0	0	1	-	-	-	-	-	-	-	-	-	57
Winter wheat	57	3	7	13	11	7	1	1	-	-	-	-	-	-	-	-	-	-	1647
Spring barley	50	4	13	19	10	2	0	1	-	-	-	-	-	-	-	-	-	-	488
Winter barley	39	3	12	14	20	9	1	1	-	-	-	-	-	-	-	-	-	-	450
Oats	51	5	10	11	11	9	1	2	-	-	-	-	-	-	-	-	-	-	151
Rye/triticale/Durum wheat	61	0	0	12	18	9	-	-	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	10	0	0	0	0	0	0	56	0	7	12	0	0	15	-	-	-	-	14
Potatoes (maincrop)	11	0	5	2	2	10	4	7	2	9	4	11	4	12	3	5	5	2	94
Sugar beet	32	0	5	9	17	14	13	5	2	0	1	0	1	1	-	-	-	-	132
Spring oilseed rape	65	3	3	6	15	1	0	7	-	-	-	-	-	-	-	-	-	-	25
Winter oilseed rape	60	2	12	12	8	5	1	-	-	-	-	-	-	-	-	-	-	-	547
Linseed	58	0	11	15	14	2	-	-	-	-	-	-	-	-	-	-	-	-	43
Forage maize	63	6	12	4	9	1	4	1	-	-	-	-	-	-	-	-	-	-	239
Rootcrops for stockfeed	29	10	9	21	16	7	2	5	1	0	0	1	-	-	-	-	-	-	51
Leafy forage crops	22	25	37	3	0	5	8	-	-	-	-	-	-	-	-	-	-	-	40
Arable silage/other fodder crops	73	6	6	6	2	6	0	0	0	1	-	-	-	-	-	-	-	-	72
Peas - human consumption	62	2	5	26	3	0	0	0	2	-	-	-	-	-	-	-	-	-	30
Peas - animal consumption	56	0	25	5	8	3	0	3	-	-	-	-	-	-	-	-	-	-	34
Beans - animal consumption	78	1	5	9	7	1	0	1	-	-	-	-	-	-	-	-	-	-	144
Vegetables (brassicae)	18	0	0	13	4	40	0	0	26	-	-	-	-	-	-	-	-	-	13
Vegetables (other)	41	6	0	11	6	21	10	4	0	2	-	-	-	-	-	-	-	-	64
Soft Fruit	21	0	0	7	0	44	0	29	-	-	-	-	-	-	-	-	-	-	12
Top Fruit	55	14	1	12	10	0	7	-	-	-	-	-	-	-	-	-	-	-	37
Other tillage	75	8	8	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	59
All tillage	54	3	9	12	11	6	2	2	-	-	-	-	-	-	-	-	-	-	4457
Grass under 5 years old	52	18	14	7	4	3	1	1	-	-	-	-	-	-	-	-	-	-	802
Grass 5 years and over	64	22	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2192
All grass	62	21	11	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2994
All crops and grass	58	12	10	8	6	3	1	1	-	-	-	-	-	-	-	-	-	-	7451

Source: British Survey of Fertiliser Practice 2011

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2011

	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	50	31	32	24	80	19	22	40	6	7	1342
Grazed mown	70	43	45	54	108	24	36	75	10	16	1312
All grazings	58	36	37	35	93	21	28	53	8	10	2654
Cut for silage - grazed	79	49	53	66	119	26	38	93	13	20	949
Cut for silage - not grazed	86	51	61	73	133	27	43	115	14	26	213
All cut for silage	80	50	54	68	121	26	39	97	13	21	1162
Cut for hay - grazed	51	30	30	25	67	19	22	34	6	7	408
Cut for hay - not grazed	63	26	36	32	81	29	47	52	7	17	98
All cut for hay	52	29	31	26	69	20	26	36	6	8	506
All mowings	71	43	47	56	111	25	37	79	11	17	1611
All grass	59	36	38	37	96	22	30	57	8	11	2994

Source: British Survey of Fertiliser Practice 2011

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	50	1	16	13	8	3	3	2	1	1	1	-	-	-	-	-	-	-	1342
Grazed mown	30	1	12	14	10	8	8	6	3	3	2	2	1	1	-	-	-	-	1312
All grazings	42	1	15	13	9	5	5	3	2	1	1	1	-	-	-	-	-	-	2654
Cut for silage - grazed	21	1	9	14	12	10	10	8	4	4	3	2	1	1	-	-	-	-	949
Cut for silage - not grazed	14	0	6	11	13	12	15	7	5	7	2	2	2	0	2	-	-	-	213
All cut for silage	20	1	9	14	12	10	11	8	4	4	2	2	1	1	-	-	-	-	1162
Cut for hay - grazed	49	2	20	13	6	4	3	1	-	-	-	-	-	-	-	-	-	-	408
Cut for hay - not grazed	37	0	8	26	12	7	4	5	-	-	-	-	-	-	-	-	-	-	98
All cut for hay	48	1	18	15	7	5	4	1	-	-	-	-	-	-	-	-	-	-	506
All mowings	29	1	11	14	10	8	9	6	3	3	2	2	1	-	-	-	-	-	1611
All grass	41	1	14	13	9	5	6	4	2	2	1	1	-	-	-	-	-	-	2994

Source: British Survey of Fertiliser Practice 2011

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	69	23	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1342
Grazed mown	57	26	13	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1312
All grazings	64	25	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2654
Cut for silage - grazed	51	29	16	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	949
Cut for silage - not grazed	49	28	14	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	213
All cut for silage	50	29	16	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1162
Cut for hay - grazed	70	21	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	408
Cut for hay - not grazed	74	16	6	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	98
All cut for hay	71	21	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	506
All mowings	57	26	13	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1611
All grass	64	24	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2994

Source: British Survey of Fertiliser Practice 2011

Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	68	22	8	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1342
Grazed mown	55	20	15	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1312
All grazings	63	21	10	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2654
Cut for silage - grazed	47	21	18	7	3	2	1	-	-	-	-	-	-	-	-	-	-	-	949
Cut for silage - not grazed	39	21	17	13	5	4	0	1	-	-	-	-	-	-	-	-	-	-	213
All cut for silage	46	21	18	8	4	2	1	1	-	-	-	-	-	-	-	-	-	-	1162
Cut for hay - grazed	70	20	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	408
Cut for hay - not grazed	64	13	11	1	6	5	0	1	-	-	-	-	-	-	-	-	-	-	98
All cut for hay	69	19	9	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	506
All mowings	53	20	15	6	3	2	-	-	-	-	-	-	-	-	-	-	-	-	1611
All grass	62	21	11	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2994

Source: British Survey of Fertiliser Practice 2011

Table EW3.0 Product use by month of application, England & Wales 2011

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	1	0	0	0	0	6	37	37	14	3	2	1
Straight P	12	14	3	1	1	9	33	13	3	0	1	10
Straight K	4	6	10	6	9	11	35	16	2	1	0	1
Compounds	7	5	1	1	1	4	29	27	11	5	3	5
All fertilisers	3	2	1	0	1	6	34	33	12	4	2	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	5	35	37	14	4	2	1
Phosphate	11	9	2	2	1	7	30	21	6	2	1	7
Potash	8	8	3	2	3	8	33	21	7	3	2	4
Total	3	2	1	0	1	6	34	33	12	4	2	2

Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2011.

'Nutrient' 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 (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B.

Source: British Survey of Fertiliser Practice 2011

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2011

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 specified	all grass	all crops and grass
Ammonium Nitrate	43.6	48.8	9.3	22.7	49.2	27.9	43.9	34.5	32.4	32.0	36.4	34.7	41.7
Urea	5.6	11.7	0.5	1.7	13.2	3.0	9.7	4.1	5.3	4.4	4.8	4.5	8.5
Calcium Ammonium Nitrate (CAN)	2.5	1.9	0.3	0.3	1.8	2.0	1.8	2.8	1.8	2.7	1.8	2.5	2.0
Urea Ammonium Nitrate (UAN)	7.0	10.9	1.9	5.8	10.4	2.6	9.2	2.1	1.5	2.4	1.0	2.0	7.5
Other Straight N	1.6	2.2	0.5	0.1	5.7	1.8	2.6	2.2	2.5	1.7	0.0	1.9	2.4
Triple Superphosphate (TSP)	1.5	2.3	0.0	0.8	1.7	2.2	1.9	0.2	0.5	0.3	0.6	0.3	1.5
Other Straight P	0.2	0.2	0.0	0.0	0.1	0.4	0.2	0.1	0.0	0.0	0.7	0.1	0.2
Muriate of Potash (MOP)	2.7	2.9	5.2	1.3	2.4	5.8	3.0	0.6	1.8	1.0	4.4	0.9	2.5
Other Straight K	0.4	0.1	0.2	29.6	0.1	2.5	1.5	0.3	0.0	0.3	0.0	0.3	1.2
PK	11.6	11.1	4.8	21.8	7.3	18.2	11.2	2.5	3.6	2.3	0.0	2.4	9.1
NK	1.0	0.8	6.3	6.3	0.8	1.6	1.4	5.7	2.7	8.0	10.1	6.0	2.5
Low N (<19% N)	7.6	2.8	65.9	7.2	6.3	20.4	8.3	3.3	4.2	2.3	7.3	3.2	7.1
High N (>=19% N)	14.8	4.2	4.8	0.4	0.7	11.3	5.2	41.6	43.6	42.6	33.1	41.3	13.8
Other	0.0	0.1	0.2	1.9	0.4	0.5	0.2	0.0	0.1	0.1	0.0	0.0	0.2
Total product ('000 tonnes)	**198**	**1521**	**79**	**98**	**480**	**118**	**2494**	**761**	**74**	**452**	**11**	**870**	**3364**

Source: British Survey of Fertiliser Practice 2011

Table EW3.2 Use of product type by crop group, England & Wales 2011

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 specified	all grass	total product ('000 tonnes)
Ammonium Nitrate	7.8	66.3	0.8	2.0	20.1	3.0	79.2	86.7	9.1	49.7	1.3	20.8	1366
Urea	5.2	66.8	0.2	0.4	26.2	1.1	90.1	81.7	15.6	53.7	2.9	9.9	349
Calcium Ammonium Nitrate (CAN)	8.3	65.9	0.3	1.0	16.9	7.6	63.2	94.0	4.3	48.7	0.7	36.8	77
Urea Ammonium Nitrate (UAN)	7.5	66.9	0.5	3.0	20.7	1.4	96.2	85.5	4.5	66.0	3.9	3.8	295
Other Straight N	3.1	51.9	0.3	0.1	43.2	1.4	81.7	99.5	4.0	50.5	0.0	18.3	71
Triple Superphosphate (TSP)	6.8	72.5	0.0	1.5	14.5	4.6	96.0	72.4	7.3	54.4	2.8	4.0	61
Other Straight P	7.8	79.0	0.0	0.0	6.9	6.3	87.9	89.8	0.0	0.0	10.2	12.1	7
Muriate of Potash (MOP)	6.9	62.1	5.3	1.8	13.9	10.0	92.6	50.9	21.6	65.9	9.4	7.4	69
Other Straight K	3.1	5.9	0.1	81.8	2.5	6.6	87.2	100.0	0.0	49.4	0.0	12.8	35
PK	8.6	58.7	1.1	10.2	11.9	9.5	94.5	93.7	10.3	48.7	0.0	5.5	290
NK	14.7	40.7	13.5	11.4	11.2	8.5	33.3	78.4	2.3	77.5	1.4	66.7	72
Low N (<19% N)	7.9	23.2	34.3	3.6	17.6	13.5	90.0	91.9	10.0	42.5	2.8	10.0	180
High N (>=19% N)	24.8	53.6	3.0	0.8	4.6	13.1	17.0	88.8	8.6	50.6	0.9	83.0	487
Other	3.2	11.6	8.1	37.4	33.9	5.8	95.9	74.7	25.3	74.7	0.0	4.1	6
All Fertilisers	**7.9**	**61.0**	**3.2**	**3.9**	**19.3**	**4.7**	**74.1**	**87.5**	**8.5**	**51.9**	**1.2**	**25.9**	**3364**

Source: British Survey of Fertiliser Practice 2011

Table EW3.3 Product use by month of application, England & Wales 2011

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	4.2	34.8	39.2	15.0	3.1	2.2	0.7	0.6	0.2	0.0	0.0	1366
Urea	0.0	11.4	42.7	28.6	9.8	4.7	1.8	0.2	0.4	0.2	0.1	0.0	349
Calcium Ammonium Nitrate (CAN)	0.0	4.2	31.6	29.9	19.7	6.8	5.1	2.3	0.4	0.0	0.0	0.0	77
Urea Ammonium Nitrate (UAN)	0.0	6.7	36.7	42.1	12.0	1.4	0.2	0.7	0.2	0.0	0.0	0.0	295
Other Straight N	0.0	14.4	45.5	27.3	6.3	6.1	0.2	0.3	0.0	0.0	0.0	0.0	71
Triple Superphosphate (TSP)	1.0	10.0	33.5	12.3	3.4	0.0	0.8	9.3	10.2	14.8	3.2	1.5	61
Other Straight P	0.0	0.0	33.9	13.9	0.0	2.5	0.0	17.7	24.3	2.8	4.9	0.0	7
Muriate of Potash (MOP)	4.5	15.4	40.3	20.0	2.3	0.5	0.3	0.8	3.3	4.9	4.6	3.1	69
Other Straight K	16.3	2.7	21.9	7.3	0.9	3.0	0.0	1.5	4.2	9.7	21.1	11.5	35
PK	4.1	10.3	23.7	11.3	1.4	0.1	0.1	7.5	22.1	13.5	3.7	2.4	290
NK	0.0	0.8	23.9	15.1	24.5	17.6	9.6	2.7	1.5	2.2	1.4	0.7	72
Low N (<19% N)	1.0	4.0	41.5	30.4	6.8	1.2	0.2	6.0	4.7	3.3	0.8	0.0	180
High N (>=19% N)	0.0	1.7	29.0	36.1	16.3	8.3	5.0	2.5	0.8	0.2	0.0	0.0	487
Other	0.0	12.8	46.8	18.4	2.7	0.0	1.0	3.0	0.0	5.6	9.6	0.0	6
All Fertilisers	**0.7**	**5.8**	**34.2**	**32.8**	**12.2**	**3.8**	**2.2**	**2.0**	**3.0**	**2.0**	**0.8**	**0.4**	**3364**

Source: British Survey of Fertiliser Practice 2011

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2011

		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	
North West	All tillage	93	53	68	60	141	45	82	131	24	56	102
	All grass	68	46	49	51	101	19	29	69	9	14	319
	All crops and grass	72	47	52	53	108	23	39	78	11	20	421
North East	All tillage	90	45	53	28	182	63	89	163	29	47	201
	All grass	46	36	34	24	74	23	30	34	8	10	195
	All crops and grass	63	39	41	25	132	41	58	83	16	24	396
Eastern	All tillage	92	44	34	10	167	64	80	154	28	27	956
	All grass	53	8	9	4	72	31	38	38	3	4	146
	All crops and grass	87	40	31	9	159	64	78	139	25	24	1102
Yorkshire and the Humber	All tillage	95	46	51	22	177	66	86	167	30	44	848
	All grass	72	34	35	43	104	28	34	75	10	12	339
	All crops and grass	87	42	46	29	156	55	73	136	23	33	1187
West Midlands	All tillage	94	37	41	25	163	59	93	153	22	38	436
	All grass	69	37	43	35	92	19	29	63	7	13	271
	All crops and grass	81	37	42	30	132	38	59	107	14	25	707
East Midlands	All tillage	94	48	49	15	175	58	69	165	28	34	654
	All grass	54	35	32	33	110	22	31	59	8	10	214
	All crops and grass	82	44	44	21	162	49	60	133	22	27	868
South West	All tillage	88	55	59	35	150	53	66	133	29	39	670
	All grass	57	34	35	47	103	21	31	59	7	11	794
	All crops and grass	67	41	43	43	124	35	47	83	14	20	1464
South East	All tillage	84	36	42	19	178	52	70	150	19	29	462
	All grass	32	13	14	14	95	17	25	30	2	3	255
	All crops and grass	61	26	29	17	159	45	61	97	11	18	717
Wales	All tillage	81	64	63	52	123	56	66	99	36	41	128
	All grass	64	51	53	37	88	23	28	56	12	15	461
	All crops and grass	65	52	54	38	92	27	31	60	14	17	589

Source: British Survey of Fertiliser Practice 2011

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2011

		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	85	45	51	33	167	56	71	142	25	36	321
	All grass	45	20	22	43	91	21	29	42	4	6	297
	All crops and grass	63	31	35	38	136	43	57	86	13	20	618
Anglia	All tillage	92	44	34	10	167	64	80	154	28	27	956
	All grass	53	8	9	4	72	31	38	38	3	4	146
	All crops and grass	87	40	31	9	159	64	78	139	25	24	1102
Northern	All tillage	90	51	54	33	166	53	75	149	27	41	185
	All grass	59	43	46	38	89	18	28	52	8	13	399
	All crops and grass	65	45	48	37	109	26	38	71	11	18	584
North East	All tillage	94	47	53	23	177	66	87	167	30	46	930
	All grass	73	40	40	42	99	28	33	72	11	13	409
	All crops and grass	87	44	48	30	153	53	71	132	23	34	1339
North Mercia	All tillage	94	32	47	45	155	51	100	147	17	47	201
	All grass	69	35	43	56	114	21	34	79	7	15	200
	All crops and grass	77	34	44	52	130	30	56	100	10	25	401
South Mercia	All tillage	92	43	43	20	163	63	84	151	27	36	308
	All grass	56	29	29	14	69	17	20	39	5	6	140
	All crops and grass	77	37	37	17	133	48	62	102	18	23	448
East Midland	All tillage	94	48	49	15	175	58	69	165	28	34	654
	All grass	54	35	32	33	110	22	31	59	8	10	214
	All crops and grass	82	44	44	21	162	49	60	133	22	27	868
South East	All tillage	84	36	42	19	178	52	70	150	19	29	462
	All grass	32	13	14	14	95	17	25	30	2	3	255
	All crops and grass	61	26	29	17	159	45	61	97	11	18	717
South West	All tillage	93	66	68	41	128	46	62	119	30	42	312
	All grass	66	43	44	53	110	21	31	72	9	14	473
	All crops and grass	72	48	50	50	115	29	41	83	14	20	785
Wales	All tillage	81	64	63	52	123	56	66	99	36	41	128
	All grass	64	51	53	37	88	23	28	56	12	15	461
	All crops and grass	65	52	54	38	92	27	31	60	14	17	589

Source: British Survey of Fertiliser Practice 2011

Table SC1.1 Total fertiliser use, Scotland 2011

	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	
Winter wheat	99	63	74	19	194	69	91	193	43	67	115
Spring barley	98	95	95	38	104	54	68	102	51	65	283
Winter barley	100	79	76	36	164	65	81	164	52	61	49
Oats	85	63	72	29	98	60	64	82	38	46	43
Potatoes	100	100	100	10	170	136	199	170	136	199	26
Winter oilseed rape	100	61	69	26	193	56	60	193	34	42	38
Other crops	53	53	53	39	103	72	86	54	38	46	94
All tillage	94	82	84	33	131	61	78	123	50	66	648
Grass less than five years old	89	80	79	40	103	28	38	91	22	30	272
Grass five years and over	62	50	49	20	75	21	23	47	10	11	397
All grass	70	58	57	25	85	23	29	59	14	16	669
All crops and grass	77	66	66	28	103	39	49	80	26	33	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.2 Use of straight fertiliser, Scotland 2011

	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	
Winter wheat	96	8	22	180	87	96	172	7	21	115
Spring barley	66	1	3	74	-	82	49	-	2	283
Winter barley	97	17	13	151	54	-	146	9	-	49
Oats	62	2	12	97	-	-	60	-	-	43
Potatoes	49	0	16	93	-	-	45	-	-	26
Winter oilseed rape	100	18	26	172	63	59	172	12	15	38
Other crops	23	0	1	81	-	-	19	-	-	94
All tillage	70	4	9	114	72	91	80	3	8	648
Grass less than five years old	25	0	1	86	-	-	22	-	-	272
Grass five years and over	19	0	0	85	-	-	16	-	-	397
All grass	21	0	0	86	-	-	18	-	-	669
All crops and grass	37	1	3	103	72	94	38	1	3	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.3 Use of compound fertiliser, Scotland 2011

	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	
Winter wheat	30	55	55	69	66	85	21	36	46	115
Spring barley	92	94	93	58	53	67	53	50	62	283
Winter barley	33	68	63	52	62	78	17	42	50	49
Oats	41	60	60	55	60	65	22	36	39	43
Potatoes	100	100	84	125	136	202	125	136	170	26
Winter oilseed rape	48	51	43	43	45	61	21	23	26	38
Other crops	46	53	52	77	72	84	36	38	44	94
All tillage	69	78	77	62	60	76	43	47	58	648
Grass less than five years old	78	80	78	89	28	37	69	22	29	272
Grass five years and over	48	50	49	63	21	23	31	10	11	397
All grass	57	58	57	73	23	28	41	14	16	669
All crops and grass	61	65	63	69	38	47	42	25	30	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.4 Use of lime, Scotland 2011

	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
Winter wheat	1.9	-	6.8	-	-	8.8	4.1	-	5.0	-	-	4.8	8	115
Spring barley	12.9	-	2.0	-	2.8	17.8	3.6	-	4.1	-	1.4	3.3	61	283
Winter barley	-	-	-	-	-	-	-	-	-	-	-	-	4	49
Oats	1.4	-	2.7	-	1.2	5.4	4.0	-	5.8	-	0.4	4.1	5	43
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	26
Winter oilseed rape	13.4	-	2.7	-	-	16.1	3.2	-	9.0	-	-	4.2	7	38
Other crops	9.2	-	7.4	-	1.6	18.2	3.8	-	5.7	-	0.9	4.3	20	94
All tillage	9.4	-	3.2	-	1.8	14.4	3.6	-	5.1	-	1.3	3.6	105	648
Grass less than five years old	5.5	-	0.7	-	0.5	6.8	4.4	-	5.1	-	3.8	4.4	27	272
Grass five years and over	2.0	-	0.4	-	0.0	2.4	3.7	-	4.5	-	5.0	3.8	22	397
All grass	2.9	-	0.5	-	0.2	3.6	4.0	-	4.7	-	4.0	4.1	49	669
All crops and grass	5.1	-	1.4	-	0.7	7.2	3.8	-	5.0	-	1.7	3.8	154	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	1	0	0	5	3	0	8	17	26	21	9	1	4	3	2	-	-	-	115
Spring barley	2	0	5	11	23	36	19	2	0	0	1	-	-	-	-	-	-	-	283
Winter barley	0	0	0	4	4	13	9	37	17	16	1	-	-	-	-	-	-	-	49
Oats	15	0	8	26	10	9	24	7	-	-	-	-	-	-	-	-	-	-	43
Potatoes	0	0	0	0	8	23	11	20	16	1	0	18	3	-	-	-	-	-	26
Winter oilseed rape	0	0	0	5	0	3	5	15	32	15	17	3	0	0	4	-	-	-	38
Other crops	47	1	5	8	10	13	7	1	5	3	-	-	-	-	-	-	-	-	94
All tillage	6	0	4	9	15	23	14	9	8	6	3	1	1	1	1	-	-	-	648
Grass less than five years old	11	1	14	15	19	11	9	9	3	4	2	1	-	-	-	-	-	-	272
Grass five years and over	38	3	17	20	8	7	3	1	1	1	1	-	-	-	-	-	-	-	397
All grass	30	2	17	19	11	8	4	3	1	2	1	-	-	-	-	-	-	-	669
All crops and grass	23	2	12	15	12	13	8	5	4	3	2	1	-	-	-	-	-	-	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	37	4	8	25	23	1	1	0	1	-	-	-	-	-	-	-	-	-	115
Spring barley	5	4	35	43	11	-	-	-	-	-	-	-	-	-	-	-	-	-	283
Winter barley	21	1	9	50	18	1	-	-	-	-	-	-	-	-	-	-	-	-	49
Oats	37	5	13	35	4	6	-	-	-	-	-	-	-	-	-	-	-	-	43
Potatoes	0	0	1	2	5	49	17	18	4	0	1	2	2	-	-	-	-	-	26
Winter oilseed rape	39	11	13	28	5	2	0	3	-	-	-	-	-	-	-	-	-	-	38
Other crops	47	3	21	7	11	2	1	8	-	-	-	-	-	-	-	-	-	-	94
All tillage	18	4	24	35	13	2	1	2	-	-	-	-	-	-	-	-	-	-	648
Grass less than five years old	20	38	34	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	272
Grass five years and over	50	33	14	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	397
All grass	42	34	19	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	669
All crops and grass	34	24	21	14	5	1	0	1	-	-	-	-	-	-	-	-	-	-	1317

Source: British Survey of Fertiliser Practice 2011

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	26	2	5	22	21	11	11	0	0	0	3	-	-	-	-	-	-	-	115
Spring barley	5	1	19	34	32	7	1	-	-	-	-	-	-	-	-	-	-	-	283
Winter barley	24	0	3	36	21	17	-	-	-	-	-	-	-	-	-	-	-	-	49
Oats	28	1	17	37	15	2	-	-	-	-	-	-	-	-	-	-	-	-	43
Potatoes	0	0	0	3	0	9	5	19	25	19	7	6	0	0	0	3	2	2	26
Winter oilseed rape	31	6	22	24	11	3	4	-	-	-	-	-	-	-	-	-	-	-	38
Other crops	47	3	19	8	4	1	6	9	1	0	1	-	-	-	-	-	-	-	94
All tillage	16	1	15	28	24	7	3	2	1	1	1	-	-	-	-	-	-	-	648
Grass less than five years old	21	30	27	15	3	2	0	1	-	-	-	-	-	-	-	-	-	-	272
Grass five years and over	51	31	14	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	397
All grass	43	31	17	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	669
All crops and grass	34	21	16	14	9	3	1	1	-	-	-	-	-	-	-	-	-	-	1317

Source: British Survey of Fertiliser Practice 2011

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2011

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	60	49	48	14	67	18	19	40	9	9	354
Grazed mown	92	82	76	52	118	34	44	108	27	34	102
All grazings	64	53	51	18	75	21	23	48	11	12	456
Cut for silage - grazed	92	85	79	53	126	35	47	115	29	37	83
Cut for silage - not grazed	92	79	79	57	116	31	43	107	24	34	178
All cut for silage	92	81	79	56	119	32	44	109	26	35	261
Cut for hay - grazed	90	63	63	47	74	26	30	67	17	19	19
Cut for hay - not grazed	91	90	90	27	70	27	37	64	24	33	35
All cut for hay	91	80	80	34	72	27	35	65	22	28	54
All mowings	92	81	79	53	113	32	43	104	26	34	311
All grass	70	58	57	25	85	23	29	59	14	16	669

Source: British Survey of Fertiliser Practice 2011

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	40	3	20	20	8	5	2	1	0	1	1	-	-	-	-	-	-	-	354
Grazed mown	8	0	8	17	16	12	11	11	6	4	3	1	1	0	1	-	-	-	102
All grazings	36	3	19	20	9	6	3	2	1	1	1	-	-	-	-	-	-	-	456
Cut for silage - grazed	8	0	10	11	14	13	12	13	7	5	3	1	1	0	1	-	-	-	83
Cut for silage - not grazed	8	0	7	12	22	19	10	9	4	6	1	0	0	1	-	-	-	-	178
All cut for silage	8	0	8	12	19	17	11	10	5	5	2	0	0	1	-	-	-	-	261
Cut for hay - grazed	10	0	0	52	28	4	6	-	-	-	-	-	-	-	-	-	-	-	19
Cut for hay - not grazed	9	0	13	35	34	6	1	2	-	-	-	-	-	-	-	-	-	-	35
All cut for hay	9	0	8	41	32	5	3	1	-	-	-	-	-	-	-	-	-	-	54
All mowings	8	0	8	16	20	16	10	9	5	5	2	0	0	1	-	-	-	-	311
All grass	30	2	17	19	11	8	4	3	1	2	1	-	-	-	-	-	-	-	669

Source: British Survey of Fertiliser Practice 2011

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2011

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	51	37	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	354
Grazed mown	18	21	51	7	3	-	-	-	-	-	-	-	-	-	-	-	-	-	102
All grazings	47	35	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	456
Cut for silage - grazed	15	21	53	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	83
Cut for silage - not grazed	21	31	38	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	178
All cut for silage	19	28	43	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	261
Cut for hay - grazed	37	19	41	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Cut for hay - not grazed	10	49	29	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
All cut for hay	20	38	33	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	54
All mowings	19	28	42	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	311
All grass	42	34	19	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	669

Source: British Survey of Fertiliser Practice 2011

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2011

	kg/ha																	Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	52	36	10	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	354
Grazed mown	24	14	37	17	4	5	-	-	-	-	-	-	-	-	-	-	-	-	102
All grazings	49	33	13	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	456
Cut for silage - grazed	21	13	36	20	4	6	-	-	-	-	-	-	-	-	-	-	-	-	83
Cut for silage - not grazed	21	20	33	19	4	1	1	1	0	1	-	-	-	-	-	-	-	-	178
All cut for silage	21	18	34	19	4	2	0	1	-	-	-	-	-	-	-	-	-	-	261
Cut for hay - grazed	37	19	41	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Cut for hay - not grazed	10	27	27	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
All cut for hay	20	24	32	23	1	-	-	-	-	-	-	-	-	-	-	-	-	-	54
All mowings	21	19	34	19	4	2	-	-	-	-	-	-	-	-	-	-	-	-	311
All grass	43	31	17	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	669

Source: British Survey of Fertiliser Practice 2011

Table SC3.0 Product use by month of application, Scotland 2011

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	2	21	48	20	5	3	1
Straight P	10	13	0	0	1	0	47	13	8	0	0	7
Straight K	0	4	0	0	0	1	54	35	4	0	0	2
Compounds	1	1	0	0	0	1	17	58	13	4	3	1
All fertilisers	1	1	0	0	0	1	19	54	16	4	3	1

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	0	0	0	0	0	1	17	55	17	6	3	1
Phosphate	3	3	0	0	0	2	22	53	12	2	1	1
Potash	2	2	0	0	0	1	25	53	11	2	2	1
Total	1	1	0	0	0	1	20	54	15	4	2	1

Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

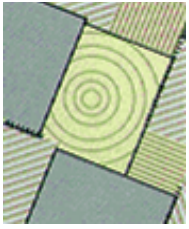
'Product' refers to the total tonnage of the products used by the farmers in the survey year 2011.

'Nutrient' 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 (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B.

Source: British Survey of Fertiliser Practice 2011



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2011

Introduction

Whilst the British Survey of Fertiliser Practice has focussed historically on the application of manufactured fertilisers, in recent years it has also collected increasingly detailed information on the use and movement of organic manures. In previous years, farmers were asked where their manure applications fell within pre-specified 'high', 'medium' and 'low' ranges. In 2007, in an effort to better quantify the organic manure data, farmers were asked to provide a specific rate of application which could then be weighted in the same way as the manufactured fertiliser data to deliver a national picture of organic manure usage. However, it should be remembered that the underlying sample design is constructed to measure manufactured fertiliser usage and may not represent the population of farmers using organic manures as robustly.

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 or imported from other sources such as treated sewage sludges (also called bio-solids) and some industrial 'wastes' such as paper waste or brewery effluent.

Of the 1,429 farms in the survey, around 70% (997) used organic manures on at least one field on the farm, the details are shown in Table D1.1a.

Table D1.1a Numbers and percentage (%) of farms using each type of manure in Great Britain, 2011

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*bio-solids*	*other non-farm*	*total with manure*
Farms in sample	431	761	262	33	14	40	45	60	19	54	38	997
Farms in population	28977	48032	15325	1613	603	1785	2069	4152	1320	2076	1485	61410
Farms in population %	32%	53%	17%	2%	1%	2%	2%	5%	1%	2%	2%	68%
Volume ('000,000 t; m^3)	n/a	31.9	38.1	1.4	1.0	0.5	0.6	1.3	1.2	2.7	1.5	80.0
Volume %	n/a	40%	48%	2%	1%	1%	1%	2%	1%	3%	2%	100%

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

Table D1.1b Percentage (%) of farms using each type of manure in Great Britain, 2007 - 2011

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2007	33	56	20	1	1	2	2	2	3
2008	31	55	18	3	1	2	3	5	4
2009	32	53	17	2	1	2	2	3	4
2010	33	53	17	2	1	2	2	4	4
2011	32	53	17	2	1	2	2	5	5

Cattle manure from beef and dairy farms is by far the largest volume of manure type generated in Great Britain. The percentage of farms using cattle FYM has declined by 3% since 2007, with the use of cattle slurry as consistent over the period and used on 17% of farms in 2011. Not all the manure generated by a farm is necessarily retained for use by that farm and excess manure/slurry can be exported for use elsewhere. Details of estimates of manure exports are given in Table D1.2.

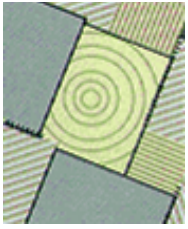


Table D1.2 Estimated volumes of exported manures and percentage (%) of farms exporting manures of each type, Great Britain 2007 - 2011

	cattle FYM		*cattle slurry*		*other*		*farms in population*
	vol	*%*	*vol*	*%*	*vol*	*%*	
2007	0.6	1.3	0.2	0.6	0.0	0.3	91361
2008	0.5	1.7	0.1	0.5	0.1	1.0	89241
2009	0.8	1.4	0.5	0.3	0.0	0.1	89404
2010	0.6	1.6	1.2	0.5	0.0	0.5	88902
2011	0.6	1.9	0.3	0.4	0.1	0.7	90386

Note: some farmers exported more than one type of manure

This indicates that only about 2% of the farmers surveyed exported manures and that cattle FYM is exported by more farms than any other manure. Data on manure types other than cattle FYM should be treated with caution due to the small numbers in the sample.

The percentage of farms exporting cattle manures is reasonably consistent over the five year period 2007-11. Exports of other types of manures remain at a low level, and appear more variable over the period, but overall the number of exporting farms in the sample is low.

Table D1.3a Estimated volumes of imported manures, Great Britain 2007 - 2011

	cattle FYM/ slurry	*pig FYM/ slurry*	*layer/hen manure*	*broiler/ turkey litter*	*other FYM*	*bio-solids*	*composted green manure*	*other*	*farms in population*
2007	1.5	0.5	0.3	0.5	0.0	2.1	1.7	0.7	91361
2008	0.8	0.6	0.2	0.6	0.1	1.5	1.5	2.5	89241
2009	1.6	0.6	0.3	0.5	0.1	3.8	1.1	0.7	89404
2010	1.4	0.7	0.3	0.5	0.1	2.3	0.5	0.5	88902
2011	1.7	0.5	0.2	0.5	0.1	2.5	1.2	0.7	90386

Note: some farmers imported more than one type of manure

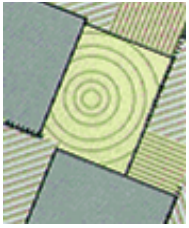
The amount of imported non-farm manures increased each year between 2003 and 2009 to 5.7 million tonnes. In 2011 this volume of imported non farm manures is lower at 4.4 million tonnes. However, care should be taken with the interpretation of these figures given the small number of farms involved. Cattle FYM and poultry manure continued to be the farm produced manures most likely to be imported.

Note that there is an imbalance between the estimate of manures exported from farms (1.0 million tonnes in 2011) and the estimate of imports (3.0 million tonnes). This is likely to be due to sampling error given the small proportion of farms involved. This is particularly true for pig and poultry manure where the coverage of BSFP is low; virtually no exports were identified yet 1.2 million tonnes of imports were recorded.

Table D1.3b Percentage (%) of farms importing manures of each type, Great Britain 2007 - 2011

	cattle FYM/ slurry	*pig FYM/ slurry*	*layer/hen manure*	*broiler/ turkey litter*	*other FYM*	*bio-solids*	*composted green manure*	*other*	*farms in population*
2007	3.2	0.8	1.1	1.7	0.1	2.1	0.4	0.8	91361
2008	3.1	0.7	1.4	2.0	0.4	1.9	0.6	0.9	89241
2009	2.9	1.2	1.2	1.6	0.2	2.2	0.4	0.8	89404
2010	2.0	1.2	1.2	2.1	0.3	2.6	0.6	1.0	88902
2011	2.9	1.0	0.8	1.7	0.2	2.3	1.2	0.8	90386

In 2011 the percentage of farms importing cattle manures increased to 2.9% and the proportion of farms importing composted green manure whilst still low was highest for the five year period.



The number and percentage of farms using each type of slurry application method in Great Britain are shown in Table 1.4. These data serve as a guide only and are calculated as an expression of the number of farms adopting a proportion of each application method, where slurry was applied. The data do not account for the proportion of each farm's total cultivatable area receiving slurry, or any variation in the rate at which slurry may have been applied using different application methods. Notwithstanding these considerations, it is clear that broadcast application is by far the most widespread method adopted both types of slurry.

Table D1.4 Number and percentage (%) of farms using each type of application method by slurry type, Great Britain 2011

			percentage of farms					
slurry type	*farms in sample*	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry	262	15325	85	9	9	0	0	2
Pig slurry	14	603	74	19	3	0	0	0
Grand Total	275	15836	85	9	9	0	0	1

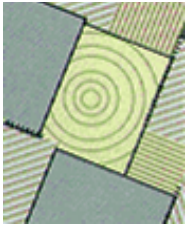
Note: some farms may apply both types of slurry

Whilst some of these application methods (e.g. shallow injection or deep injection) apply slurry below the surface of the field, the majority require secondary cultivation to incorporate the manure/slurry into the soil. 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. As manure on grass fields is seldom incorporated (unless they are destined for re-seeding), grass fields have been excluded from the incorporation analysis.

Table D1.5 gives estimates of the volume and area of manure/slurry incorporation on tillage fields by manure type and immediacy of incorporation. Farm yard manure is the most extensively incorporated at 96% of the area with 86% of it incorporated within a week of spreading on tillage fields. Cattle slurry is less likely to be incorporated at 84% of the volume and this incorporation tends to be later than for FYM, with 20% of the volume incorporated after one week.

Table D1.5 Percentage of incorporated of organic manure volume and area on tillage fields by incorporation time and manure/slurry type, Great Britain 2011

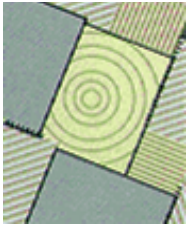
	incorporation time after spreading										*total*	
	not incorporated		*within 6 hours*		*between 6 and 24 hours*		*between 1 and 7 days*		*more than 1 week*		*applied area*	*volume applied*
	%area	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*'000 ha*	*'000,000t;m³*
FYM	4	2	8	10	37	37	37	39	14	12	666	14.1
Cattle slurry	24	16	14	18	22	23	18	21	20	20	95	3.0
Pig slurry	35	23	0	0	29	30	34	46	1	1	31	0.8
Poultry FYM	8	6	17	13	48	51	21	26	6	4	133	1.1
Other	4	5	20	19	37	39	28	26	11	11	200	4.2
Total	7	5	11	12	37	36	32	34	13	12	1126	23.2



Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor (Table D1.6). The percentage of farmers using a contractor to spread at least some of their FYM and cattle slurry is consistent with previous years at 26% and 24% respectively. Where contractors were used they were applying between 81% and 92% of the manure on average.

Table D1.6 Use of contractors to spread manure/slurry in current season, Great Britain 2011

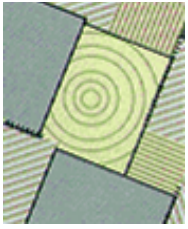
	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	26	29	81
Cattle slurry	24	21	92
Other	50	57	92
Total	28	29	86



D2 USE OF ORGANIC MANURES

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. When making comparisons of the data presented in this report a number of factors should be taken into account:

- the extent to which individual farmers have accounted for the nutrients in the manures cannot be judged from these data,
- 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 fields 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.



The proportion of the sown area, of all crops, receiving each of the main types of manure is shown in Table D2.1a, with cattle FYM and cattle slurry being the most extensively applied manures.

Table D2.1a Percentage of sown area receiving each organic manure type, Great Britain 2007 - 2011

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
2007	16	9	0	0	1	1	0	1
2008	15	9	1	0	1	1	1	2
2009	16	8	0	0	1	1	1	2
2010	16	9	1	0	1	1	1	2
2011	15	8	0	0	1	1	1	2

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

Table D2.1b Percentage of sown area where organic manure is applied receiving each organic manure type, Great Britain 2007 – 2011

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
2007	62	36	2	2	3	2	1	5
2008	56	33	3	2	3	5	4	7
2009	59	30	2	1	2	3	2	8
2010	58	32	3	1	2	3	2	7
2011	55	31	2	1	2	3	3	9

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

The percentage of the sown area receiving an application of cattle FYM has declined slightly since 2007 to 15%.

The levels of nutrient within organic manures vary according to which type of manure is being applied as well as factors such as the size, age, gender, and market for the animals being farmed. Furthermore, the concentration of nutrients is dependent on the proportion of bedding, the length of time that the manure has been stored and, in the case of slurries particularly, diluting factors such rainwater or dirty water which affect the proportion of dry matter. The British Survey of Fertiliser Practice does not ask detailed questions on the animals producing manures or the nutrient analysis of any organic applications made, but it is possible to use typical values for different manure types to estimate the likely nutrient levels delivered. Details of these values are given in Table D2.2.

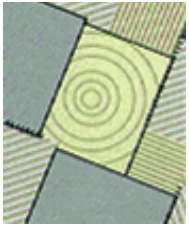


Table D2.2 Typical dry matter and nutrient content of different organic manure types[10]

	dry matter (%)	*total N (kg/t; kg/m³)*	*total P_2O_5 (kg/t; kg/m³)*	*total K_2O (kg/t; kg/m³)*
Cattle FYM	25	6.0	3.2	8.0
Pig FYM	25	7.0	6.0	8.0
Sheep FYM	25	6.0	3.2	8.0
Duck manure	25	6.5	5.5	7.5
Layer hen manure	30	16.0	13.0	9.0
Broiler/turkey litter	60	30.0	25.0	18.0
Cattle slurry	6	2.6	1.2	3.2
Pig slurry	4	3.6	1.8	2.4
Digested liquid sewage sludge	4	2.0	3.0	0.1
Digested cake	25	11.0	18.0	0.6
Thermally dried	95	40.0	75.0	2.0
Lime stabilised	40	8.5	26.0	0.8
Composted green manure	65	11.0	6.0	3.0

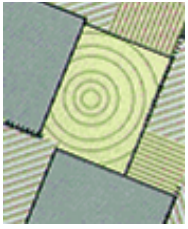
In Table D2.3, crops receiving manure applications have been classified as either “winter sown”, “spring sown” or “grass” and their average treated areas and manure application rates shown.

Table D2.3a Treated areas and average manure application rates to winter sown and spring sown crops and grassland by manure type, Great Britain 2011

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*
Winter sown										
Treated area %	7.6	0.9	0.6	0.6	1.3	1.6	0.4	0.2	2.8	1.6
Treated area (ha)	238,827	26,967	20,144	19,749	40,909	51,488	13,823	7,856	87,248	50,851
Avg manure rate (t; m³/ha)	20	30	32	32	8	7	26	27	19	21
Volume ('000,000 t ; m³)	4.7	0.8	0.7	0.6	0.3	0.3	0.4	0.2	1.6	1.1
Fields in sample	326	37	21	25	33	39	18	9	63	41
Spring sown										
Treated area %	26.5	4.8	1.5	0.3	0.8	1.3	0.9	-	1.5	1.2
Treated area (ha)	373,595	68,440	21,538	4,534	11,499	19,017	13,246	-	20,559	16,736
Avg manure rate (t; m³/ha)	21	32	25	29	9	8	18	-	25	20
Volume ('000,000 t ; m³)	7.9	2.2	0.5	0.1	0.1	0.2	0.2	-	0.5	0.3
Fields in sample	590	123	25	13	20	27	20	4	26	30
Grass										
Treated area %	22.3	22.9	0.2	0.2	0.3	0.3	1.5	0.8	0.3	0.2
Treated area (ha)	1,167,027	1,197,583	9,929	11,226	15,693	14,688	77,509	41,658	17,749	12,405
Avg manure rate (t; m³/ha)	16	29	18	22	3	6	9	20	31	8
Volume ('000,000 t ; m³)	18.8	35.1	0.2	0.2	0.1	0.1	0.7	0.9	0.6	0.1
Fields in sample	761	610	11	9	12	24	46	25	6	12

Note: This table excludes crops that cannot be classified as either winter or spring sown, such as permanent crops.

[10] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London.



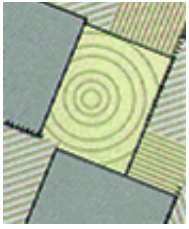
The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure within the farm on which it is produced. Conversely, non-farm manures such as biosolids appear to be favoured on winter sown tillage land.

Table D2.3b Cattle FYM treated areas and average manure application rates to winter sown and spring sown crops and grassland by farm type, Great Britain 2011

Cattle FYM	*Cereals*	*Dairy*	*General cropping*	*Mixed*	*Other livestock*	*All farm types*
Winter sown						
Treated area %	22.3	14.4	7.8	40.9	14.1	100.0
Treated area (ha)	53,152	34,284	18,618	97,654	33,741	238,827
Avg manure rate (t; m^3/ha)	21	21	24	20	15	20
Volume ('000,000 t ; m^3)	1.1	0.7	0.4	2.0	0.5	4.7
Fields in sample	51	61	34	113	65	326
Spring sown						
Treated area %	16.6	25.0	14.9	20.1	21.9	98.5
Treated area (ha)	62,848	94,650	56,664	76,350	83,084	373,595
Avg manure rate (t; m^3/ha)	21	21	24	22	19	21
Volume ('000,000 t ; m^3)	1.3	2.0	1.4	1.7	1.6	7.9
Fields in sample	59	150	73	132	176	590
Grass						
Treated area %	1.2	13.6	2.8	3.1	78.5	99.0
Treated area (ha)	13,975	159,920	32,561	36,028	924,543	1,167,027
Avg manure rate (t; m^3/ha)	13	22	12	18	15	16
Volume ('000,000 t ; m^3)	0.2	3.5	0.4	0.6	14.1	18.8
Fields in sample	7	104	23	30	597	761

Note: Only cattle FYM was applied in sufficient volume to warrant reporting by farm type. The treated area percentages may not add to 100% in “All farm types” as pig and poultry farms have been excluded.

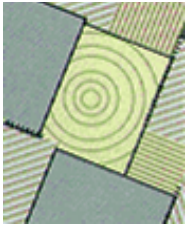
Table 2.3b shows a breakdown of the cattle FYM applications by robust farm type. Mixed farms have the most extensive treatments of cattle FYM on winter sown crops at 40.9% of the treated area. On grass 78.5% of the treated area (with Cattle FYM) is on Other Livestock robust classification farms.



The time of year when manure was applied is shown in Table D2.4 as a proportion of fields receiving manure applications. Once again the crops have been classified as either "winter sown", "spring sown" or "grass". This segmentation highlights the prevalence of applications in August and September for winter sown crops (prior to drilling), whereas spring sown and grass fields are predominantly treated between November and April.

Table D2.4 Percentage of fields receiving each organic manure type by sowing season and timing, Great Britain 2011

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*
Winter sown										
August	27	13	62	36	31	55	32	45	36	61
September	49	28	28	25	51	7	54	39	54	21
October	17	28	11	4	7	28	14	0	3	9
Winter (Nov, Dec, Jan)	2	0	0	0	1	0	0	0	3	1
Spring (Feb, Mar, Apr)	4	31	0	34	9	0	0	16	0	2
Summer (May, Jun, Jul)	2	0	0	1	0	10	0	0	3	5
Spring sown										
August	1	0	7	0	0	0	3	-	0	0
September	7	2	22	0	0	9	2	-	3	3
October	4	3	0	0	4	4	7	-	13	1
Winter (Nov, Dec, Jan)	7	13	8	20	22	0	16	-	3	28
Spring (Feb, Mar, Apr)	78	79	63	63	73	87	73	-	81	66
Summer (May, Jun, Jul)	3	1	0	17	1	0	0	-	0	2
Grass										
August	5	5	0	0	0	8	11	4	4	12
September	8	1	16	0	3	5	15	1	0	0
October	9	2	0	0	0	0	3	18	0	37
Winter (Nov, Dec, Jan)	18	16	0	0	43	0	5	22	0	0
Spring (Feb, Mar, Apr)	45	53	64	83	45	51	48	32	96	17
Summer (May, Jun, Jul)	15	22	20	17	10	36	18	23	0	34



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 usually be reduced[11]. 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. Organic fields, which use no mineral fertilisers, have been excluded from these comparisons, since they would distort the influence of manures on mineral application rates. Table D3.1a shows the dressing cover, average field rate and overall fertiliser rates for the main tillage crops in Great Britain, with and without manure inputs.

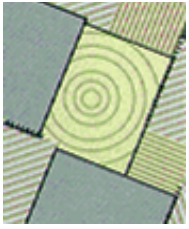
Table D3.1a Dressing cover and application rates of manufactured fertiliser to tillage crops in Great Britain, with and without applications of organic manure, 2011

	nitrogen		*phosphate*		*potash*		*fields in sample*	
dressing cover (%)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	100	100	28	50	40	46	297	1435
Spring barley	98	99	80	64	82	67	271	481
Winter barley	99	100	50	59	56	64	131	366
Potatoes (maincrop)	97	99	83	94	87	95	44	66
Sugar beet	93	98	21	57	58	75	54	78
Winter oilseed rape	100	100	20	50	24	44	106	479

	nitrogen		*phosphate*		*potash*		*fields in sample*	
average field rate	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	180	199	53	64	75	75	297	1435
Spring barley	99	108	47	54	56	69	271	481
Winter barley	138	144	47	54	60	77	131	366
Potatoes (maincrop)	151	180	147	127	229	224	44	66
Sugar beet	86	101	46	63	86	124	54	78
Winter oilseed rape	175	203	51	60	62	66	106	479

	nitrogen		*phosphate*		*potash*		*fields in sample*	
overall app rate	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	179	198	15	32	30	34	297	1435
Spring barley	97	107	37	35	47	47	271	481
Winter barley	137	144	24	32	34	49	131	366
Potatoes (maincrop)	146	178	122	119	199	213	44	66
Sugar beet	81	99	10	36	50	93	54	78
Winter oilseed rape	174	203	10	30	15	29	106	479

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



For all the major tillage crops the overall rate of nitrogen from manufactured mineral fertiliser is consistently higher on fields where organic manures were not applied. Application rate increases of nitrogen ranged from 10 kg/ha for spring barley to 32 kg/ha on potatoes, although the fact that the data derive from fewer fields should be taken into account. This is also predominantly the case for phosphate and potash fertiliser application rates. This was most dramatically illustrated by a 66% decrease in the application rate of phosphate on manured winter oilseed rape fields. This decrease was mainly caused by a reduction in dressing cover with only 20% of manured winter oilseed rape fields receiving a dressing of phosphate fertiliser. The survey does not collect reasons why manufactured fertiliser application rates may vary when used with or without organic manures. It is possible that certain fields are being managed to achieve a desired nutrient status and a strategy of this sort may require unusually high or low applications of specific nutrients. Where only a small number of fields are surveyed, such a strategy may exert an influential bias on the overall figures for a crop.

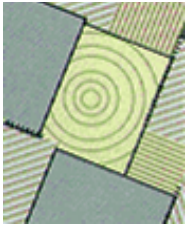
Table D3.1b Overall field rate from manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2007 - 2011

nitrogen	*2007*		*2008*		*2009*		*2010*		*2011*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	168	194	161	183	180	192	187	197	179	198
Spring barley	94	103	88	101	89	107	91	108	97	107
Winter barley	108	141	122	137	138	142	138	146	137	144
Potatoes (maincrop)	109	144	154	156	155	185	139	138	146	178
Sugar beet	79	99	80	89	88	101	87	96	81	99
Winter oilseed rape	181	191	159	197	176	191	175	204	174	203

phosphate	*2007*		*2008*		*2009*		*2010*		*2011*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	21	33	17	30	9	18	16	29	15	32
Spring barley	41	36	39	33	34	29	35	36	37	35
Winter barley	34	36	25	37	20	23	26	35	24	32
Potatoes (maincrop)	91	151	140	127	108	164	99	135	122	119
Sugar beet	11	50	15	39	13	24	11	38	10	36
Winter oilseed rape	19	32	14	31	5	23	10	33	10	30

potash	*2007*		*2008*		*2009*		*2010*		*2011*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	36	40	31	37	21	23	26	32	30	34
Spring barley	51	49	48	48	39	43	45	50	47	47
Winter barley	46	62	41	53	29	35	36	50	34	49
Potatoes (maincrop)	141	230	260	227	176	291	163	230	199	213
Sugar beet	81	110	84	93	64	80	88	73	50	93
Winter oilseed rape	39	37	25	36	12	26	17	32	15	29

Differences in field rates with and without manures for nitrogen, phosphate and potash for the period 2007 to 2011 are shown in table D3.1b above. The trend for higher nitrogen rates on unmanured fields holds true for nitrogen for all major tillage crops throughout the period, with the exception being potatoes in 2010. The increased rates are most consistent for nitrogen on winter wheat at between 5% and 13% increase over manured fields. Overall rates for phosphate and potash in winter wheat show a similar trend over the five year period. Other crops show greater variability between manured and unmanured field rates for the different nutrients which may in part be due to the lower number of fields of each of these crops in the survey causing higher statistical variability.



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 Robust farm type groups) 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.

Table D3.2 Average fertiliser application rate on grassland with and without applications of organic manure by robust type group, Great Britain 2011

	nitrogen		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Cereals								
Grass under 5 years old *	102	112	18	32	26	51	7	91
Grass 5 years and over *	124	74	52	26	51	29	9	235
All grass	109	88	28	28	35	38	16	326
Dairy								
Grass under 5 years old	159	117	27	27	50	43	176	51
Grass 5 years and over	142	111	27	21	36	25	254	174
All grass	148	112	27	22	42	28	430	225
General cropping								
Grass under 5 years old *	79	106	9	27	26	40	19	65
Grass 5 years and over *	85	78	19	26	19	33	20	171
All grass	82	86	16	26	20	35	39	236
Mixed								
Grass under 5 years old	151	118	35	28	58	40	22	152
Grass 5 years and over	87	85	29	24	40	28	34	228
All grass	110	98	33	26	50	34	56	380
Other livestock								
Grass under 5 years old	104	86	24	29	34	35	189	193
Grass 5 years and over	80	62	21	18	26	20	560	726
All grass	85	65	22	19	28	22	749	919
All farm types								
Grass under 5 years old	132	105	25	28	42	39	413	554
Grass 5 years and over	103	73	23	19	29	23	877	1543
All grass	111	80	23	21	33	26	1290	2097

Note: The values in “All farm types” exceed the sum of the components in the table as it also includes pig and poultry farms
* Note: small number of fields receiving manures

When looking at all farm types taken together, the rates of nitrogen and potash fertiliser were higher on fields where manures were also used. Mineral fertiliser rates were also consistently higher on short term grass than permanent grassland. The data for certain robust groups, notably cereals, general cropping and mixed farms are derived from relatively few fields so need to be treated with due caution.

As so many fields on dairy farms receive manure, a separate analysis was carried out to examine the influence of grass management (Table D3.3a).

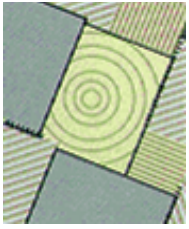


Table D3.3a Average fertiliser application rate on dairy grassland with and without applications of organic manure, Great Britain 2011

	nitrogen		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
All cut for hay	70	112	24	14	33	26	13	16
All cut for silage	158	117	28	30	48	46	293	65
All grazings	143	111	27	21	40	27	363	209

Application rates of mineral fertilisers are consistently higher for grass to be cut for silage.

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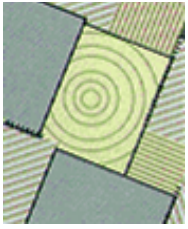
Table D3.3b Average fertiliser application rate on dairy grassland with and without applications of organic manure, Great Britain 2007 – 2011

	nitrogen		*phosphate*		*potash*		*fields in sample*	
all cut for hay	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2007	92	101	27	20	43	45	32	15
2008	107	97	23	21	22	25	29	12
2009	129	77	22	17	41	19	29	15
2010	70	99	25	22	29	43	25	15
2011	70	112	24	14	33	26	13	16

	nitrogen		*phosphate*		*potash*		*fields in sample*	
all cut for silage	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2007	162	151	31	28	53	57	253	64
2008	149	142	28	29	49	48	229	52
2009	154	127	29	32	48	44	280	66
2010	163	144	27	35	50	53	277	77
2011	158	117	28	30	48	46	293	65

	nitrogen		*phosphate*		*potash*		*fields in sample*	
all grazings	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2007	148	128	26	25	41	34	364	159
2008	137	135	26	26	41	35	315	147
2009	146	115	28	22	42	27	375	194
2010	155	125	25	23	39	28	359	226
2011	143	111	27	21	40	27	363	209

Mineral fertiliser application rates of nitrogen are variable over the 5 year period 2007-11 irrespective of the grass management system. Data for grass cut for hay should be treated with caution as the number of fields managed this way is low. Average field rates of phosphate are more stable, particularly on manured fields, in the range of 27-31 kg/ha for fields cut for silage and 25-28 kg/ha on all grazed fields. Potash average field rates for manured silage and grazed grass were in the range 48-53 kg/ha and 39-41 kg/ha respectively.



D4 SPREADING PRECISION AND RECORD KEEPING

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.

In 2011, 39% of farmers, who were using a spreader, indicated they check the accuracy of mineral fertiliser spreaders by using catch trays on an annual basis (Table D4.1). Farmers checking more frequently than this total 6%, checking at each change of fertiliser. Twenty six percent of farmers never check their spreaders for accuracy.

Table D4.1 Frequency of spread pattern checks using a catch tray, of those farms with a spreader, Great Britain 2007-2011

	No spreader	*It is factory set & doesn't need checking*	*At each change of fertiliser type*	*Less than once a year*	*Once a year*	*Never checked*	*Contract applied*	*Other*
2007	3	9	7	14	37	23	6	4
2008	8	9	7	12	41	25	4	2
2009	6	8	5	11	38	25	11	3
2010	9	8	6	10	40	27	9	0
2011	8	6	4	11	39	26	11	2

Practices of checking are generally consistent over the five year period 2007-2011. The exception to this is an increase in contract applications which have risen from 6% of farms in 2007 to 11% of farms in 2011.

Table D4.2a Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 20010/11 crop year, Great Britain 2011

	manufactured fertilisers		*organic manures*	
	farms	*farms %*	*farms*	*farms %*
Computer program	16869	22.0	8465	17.3
Farm diary	31286	40.9	21285	43.6
Farm notebook/pocketbook	15984	20.9	8841	18.1
File record sheet (file in the office)	17142	22.4	11143	22.8
Other paper record	1430	1.9	834	1.7
No records kept	4536	5.9	4137	8.5

Note: more than one method may be used

Farm diaries continue to be the most common method for recording both fertiliser and manure use (Table D4.2a). Computers were used for recording fertiliser applications on 22% of farms, whereas no records were kept on 6% of farms. Computerised record keeping is less common for organic manures at 17% of farms.

Table D2.4b shows the approach to record keeping on different types of farms. For manufactured fertilisers use of computers is highest on cereal farms at 39%, and lowest on dairy and other livestock farms, where a higher proportion use farm diaries. Farms of all types favour diaries for recording applications of organic manures.

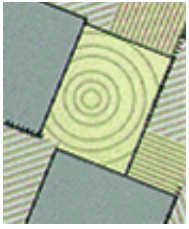


Table D4.2b Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 20010/11 crop year, by farm type, Great Britain 2011

	manufactured fertilisers		*organic manures*	
Cereals	*farms*	*farms %*	*farms*	*farms %*
Computer program	6297	39.0	1439	26.4
Farm diary	4632	28.7	1886	34.6
Farm notebook/pocketbook	3270	20.3	818	15.0
File record sheet (file in the office)	4609	28.6	1846	33.8
Other paper record	256	1.6	90	1.6
No records kept	238	1.5	0	0.0
	manufactured fertilisers		*organic manures*	
Dairy	*farms*	*farms %*	*farms*	*farms %*
Computer program	1670	17.0	1422	17.3
Farm diary	4925	50.2	3565	43.3
Farm notebook/pocketbook	2204	22.5	1643	20.0
File record sheet (file in the office)	2055	21.0	2013	24.5
Other paper record	137	1.4	137	1.7
No records kept	624	6.4	906	11.0
	manufactured fertilisers		*organic manures*	
General cropping	*farms*	*farms %*	*farms*	*farms %*
Computer program	3762	29.6	1580	31.2
Farm diary	4779	37.6	1878	37.1
Farm notebook/pocketbook	2171	17.1	1100	21.7
File record sheet (file in the office)	3950	31.0	1612	31.9
Other paper record	360	2.8	43	0.9
No records kept	46	0.4	0	0.0
	manufactured fertilisers		*organic manures*	
Mixed	*farms*	*farms %*	*farms*	*farms %*
Computer program	2289	28.8	1663	28.3
Farm diary	2961	37.3	2173	37.0
Farm notebook/pocketbook	1797	22.6	1273	21.7
File record sheet (file in the office)	2331	29.3	1717	29.2
Other paper record	99	1.2	49	0.8
No records kept	190	2.4	211	3.6
	manufactured fertilisers		*organic manures*	
Other livestock	*farms*	*farms %*	*farms*	*farms %*
Computer program	2363	8.1	2112	8.8
Farm diary	13949	47.6	11743	49.2
Farm notebook/pocketbook	6474	22.1	3988	16.7
File record sheet (file in the office)	4099	14.0	3857	16.2
Other paper record	579	2.0	516	2.2
No records kept	3437	11.7	3019	12.6
	manufactured fertilisers		*organic manures*	
All farm types	*farms*	*farms %*	*farms*	*farms %*
Computer program	16869	22.0	8465	17.3
Farm diary	31286	40.9	21285	43.6
Farm notebook/pocketbook	15984	20.9	8841	18.1
File record sheet (file in the office)	17142	22.4	11143	22.8
Other paper record	1430	1.9	834	1.7
No records kept	4536	5.9	4137	8.5

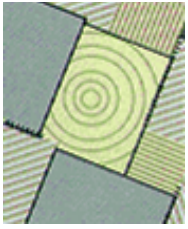
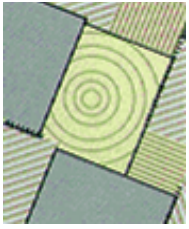


Table D4.2c Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied in the crop year, Great Britain 2007-2011

		Computer program	*Farm diary*	*Farm notebook/ pocket-book*	*File record sheet (file in the office)*	*Other paper record*	*No records kept*
manufactured fertilisers	2007	22.6	42.7	30.8	22.4	3.8	5.9
	2008	18.7	43.6	30.4	29.6	0.4	5.2
	2009	20.0	45.0	28.8	20.5	3.0	4.9
	2010	23.8	43.9	24.2	22.7	5.3	5.8
	2011	22.0	40.9	20.9	22.4	1.9	5.9
organic manures	2007	18.2	44.3	27.8	19.2	3.3	11.0
	2008	11.7	48.1	27.7	24.7	0.5	10.4
	2009	12.4	52.7	26.1	18.2	3.7	7.6
	2010	17.2	47.9	21.4	23.5	4.9	8.5
	2011	17.3	43.6	18.1	22.8	1.7	8.5

Recording methods for manufactured fertilisers show minor variations across the five year period 2007-11 with farm diaries remaining the most widely used recording method. For organic manures, records of some type were kept on 89-92% of farms for the five year period.



APPENDIX 1 - SURVEY STATISTICS

APP 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2011

Great Britain

	standard errors 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	2.2	2.6	1.2	1.2	1.6	2.0	2.1	4.8	1.4	1.7	1762
oilseed rape	2.5	2.7	1.2	1.6	1.9	2.4	2.5	4.2	1.8	2.2	613
winter barley	2.2	2.8	1.7	1.6	2.2	2.1	2.3	4.9	1.7	2.1	499
spring barley	2.0	2.5	1.6	1.3	1.6	1.8	2.1	1.8	1.3	1.5	771
m/c potatoes	7.7	6.0	8.0	7.5	13.8	6.7	7.3	6.7	6.6	12.8	113
sugar beet	4.4	4.4	2.9	6.0	6.9	4.1	3.9	11.7	12.1	6.4	132
all tillage crops	2.1	2.4	1.0	0.9	1.2	1.9	1.9	1.8	1.1	1.6	4916
all grass	1.8	1.6	1.1	0.4	0.5	1.9	2.4	1.7	0.7	1.1	3663

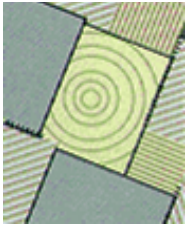
England & Wales

	standard errors 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	2.3	2.7	1.2	1.2	1.6	2.1	2.1	5.5	1.5	1.8	1647
oilseed rape	2.6	2.8	1.2	1.6	1.9	2.6	2.6	4.8	1.9	2.4	572
winter barley	2.3	3.0	1.8	1.7	2.3	2.2	2.4	5.5	1.8	2.3	450
spring barley	2.4	3.0	1.8	1.4	1.9	2.2	2.4	2.8	1.8	2.2	488
m/c potatoes	8.3	6.7	8.9	8.5	14.8	7.1	7.9	7.5	7.4	13.2	94
sugar beet	4.4	4.4	2.9	6.0	6.9	4.1	3.9	11.7	12.1	6.4	132
all tillage crops	2.3	2.6	1.0	0.9	1.2	2.1	2.0	2.4	1.3	2.0	4282
all grass	2.0	1.8	1.2	0.4	0.6	2.2	2.6	2.0	0.8	1.3	2994

Scotland

	standard errors 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	6.5	8.6	5.6	4.6	6.1	6.4	7.5	10.1	3.9	4.9	115
oilseed rape	7.8	9.3	6.0	5.9	6.7	7.8	9.3	8.5	5.1	6.0	41
winter barley	5.6	7.2	5.4	4.8	5.9	5.6	6.3	9.5	3.5	3.9	49
spring barley	3.2	4.0	2.7	2.1	2.4	2.9	4.2	2.4	1.8	2.0	283
m/c potatoes	19.6	14.4	16.7	14.6	36.3	17.3	21.3	15.2	14.6	36.3	19
all tillage crops	4.0	4.8	2.5	2.2	2.5	3.8	5.2	2.4	1.9	2.2	634
all grass	3.6	2.9	2.8	0.9	1.2	3.5	5.5	3.2	1.4	1.7	669

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 then 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 1.2 RESPONSE RATE

Tables App 1.2 and App 1.3 summarise information regarding the response received to the main and reserve samples.

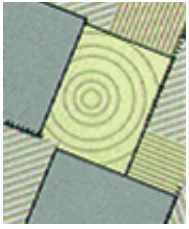
Table App 1.2 Response to main and reserve samples in 2011

	2011	*% total*
Target sample	1500	100
2010 panellists agreeing to re-contact in 2011	1303	87
Achieved 'Main' sample from 2011 panel	899	60
Achieved additional 'Main' sample	265	18
Achieved '1st reserve' sample	165	11
Achieved '2nd reserve' sample	60	4
Achieved '3rd reserve' sample	40	3
Total achieved	**1429**	**95**
Total number of refusals/non-contact	1013	
Total number of farms approached	***2442***	

Table App 1.3 Response to main and reserve samples for 2007 - 2011

Net response rate	*2007 %*	*2008 %*	*2009 %*	*2010 %*	*2011 %*
Overall achieved rate	89	88	92	91	95
Achieved % of total contact attempts	51	48	53	48	59
Main sample	72	84	81	83	81
Reserve sample(s)	28	16	19	17	19
Main reason for refusal	*2007 %*	*2008 %*	*2009 %*	*2010 %*	*2011 %*
Too busy	19	18	18	15	20
Not interested	8	9	14	10	13
Do not do surveys	3	3	3	3	4
Want payment	1	1	0	0	0
Too much paperwork	1	0	1	0	1
Non contact	24	43	36	55	40
Other [a]	44	26	27	16	22

[a] includes late submission, contributed enough and incorrect telephone number
Farms in the >200ha size band are oversampled by 25%, which has the effect of increasing response rates.

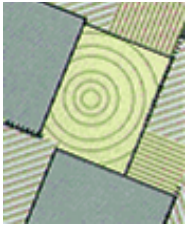


APPENDIX 2

APP 2.1 ENGLISH COUNTIES WITHIN BSFP AND DEFRA REGIONS

List of English counties indicating the BSFP and Government Office Regions within which they fall.

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



APPENDIX 3

APP 3.1 UK FARM CLASSIFICATION SYSTEM

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

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 the Defra contact shown at the front of this publication. 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 the Defra contact shown at the front of this publication.

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