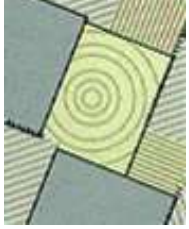
THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2012



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

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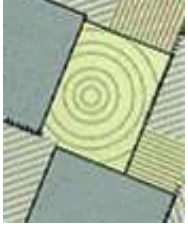


FOREWORD

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

The 2012 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 2012, 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 and comparison to the EU

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 Survey 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.

Information on all of these topics are available from the Gov.UK website and includes information on greenhouse gas emissions, climate change and NVzs which are of particular relevance.

The data are also used to meet certain legislative obligations at a national and EU level. Information on the use of fertilisers across the EU is available from the Eurostat website. It includes a summary report with a comparison of the usage and links to detailed data for the individual countries.

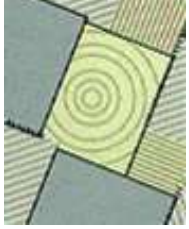
Contact information and feedback

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

Data revisions

See section A2.6 for details of revisions made in 2012.

April 2013



ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2012 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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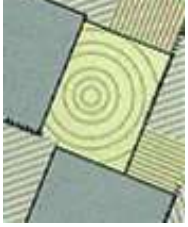

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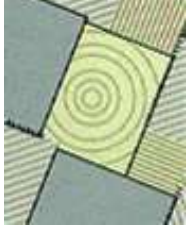

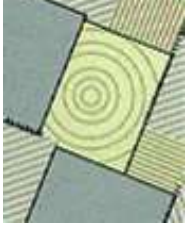

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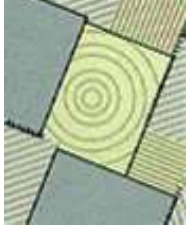
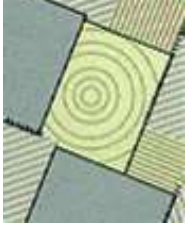
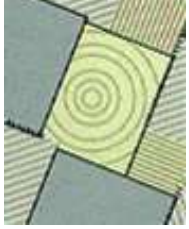






EXECUTIVE SUMMARY

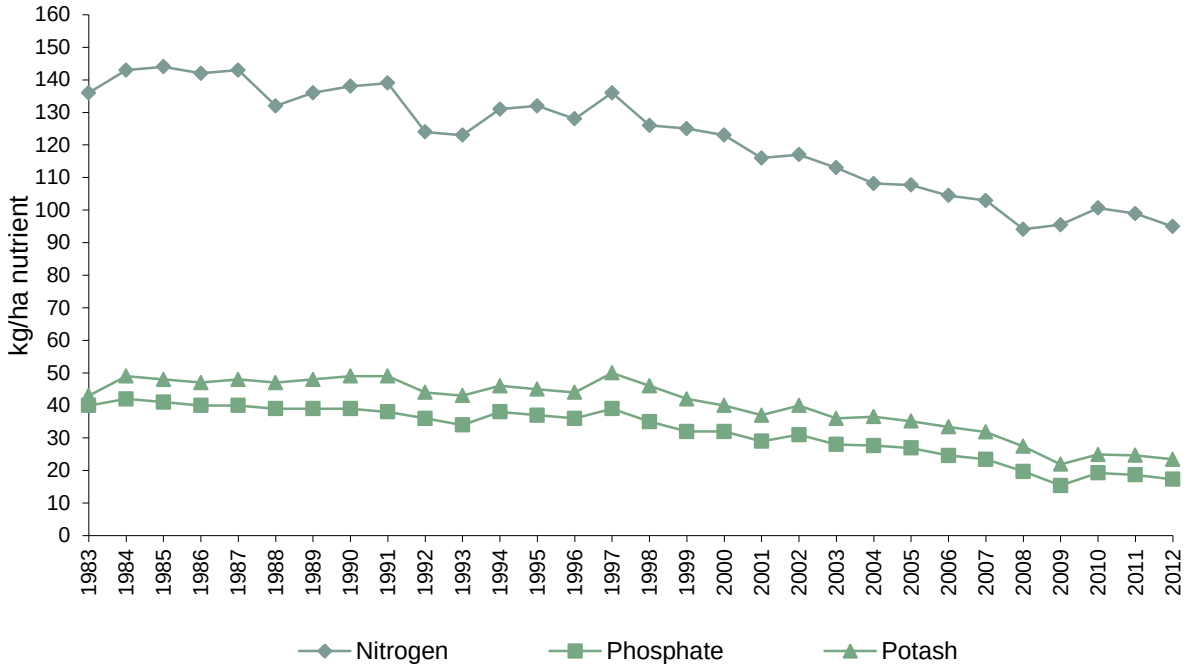
The British Survey of Fertiliser Practice is an annual, nationally representative interview survey based on the selection of a random stratified sample of farms from mainland Britain. The main purpose of the survey is to estimate average application rates of nitrogen, phosphate and potash used for agricultural crops and grassland. The data provide important evidence to assess greenhouse gas emissions from agriculture and for developing possible mitigation measures. Information is also collected on applications of sulphur fertilisers, organic manures and lime.

The main findings from the 2012 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 of Section B. Weather and economic factors which may have contributed to recorded changes in fertiliser use during the 2011/2012 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 2012

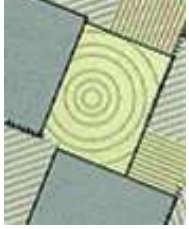
	All Tillage	All Grass	All Crops and Grass
Total Nitrogen - N			
Overall application rate, 2012 (kg/ha)	144	55	95
Mean overall application rate, 2008-2012 (kg/ha)	142	57	97
Crop area receiving dressing, 2012 (%)	91	61	74
Total Phosphate - P_2O_5			
Overall application rate, 2012 (kg/ha)	28	9	17
Mean overall application rate, 2008-2012 (kg/ha)	28	9	18
Crop area receiving dressing, 2012 (%)	47	41	44
Total Potash - K_2O			
Overall application rate, 2012 (kg/ha)	37	12	23
Mean overall application rate, 2008-2012 (kg/ha)	38	13	24
Crop area receiving dressing, 2012 (%)	47	42	44
Total Sulphur - SO_3			
Overall application rate, 2012 (kg/ha)	29	2	14
Mean overall application rate, 2008-2012 (kg/ha)	24	2	12
Crop area receiving dressing, 2012 (%)	47	7	25

Figure ES1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2012



Nitrogen

- Nitrogen encourages growth of stems and leaves, being a major constituent of protein and chlorophyll. Provided there are adequate supplies of water and other nutrients, nitrogen usually has a large immediate effect on crop growth, yield and quality. Most agricultural soils contain too little naturally occurring plant-available nitrogen to meet the needs of a crop throughout the growing season. Consequently, supplementary nitrogen applications have to be made each year. Correct rate and timing of nitrogen fertiliser application is important so that crops make best use of the nitrogen applied and there is minimum risk of adverse environmental impact resulting from the application.
- Total nitrogen (N) applied decreased by 2 kg/ha on tillage crops and grassland between 2011 and 2012 to 144 and 55 kg/ha respectively. The total nitrogen rate on all crops and grassland reduced by 4 kg/ha to 95 kg/ha. Overall application rates of nitrogen on the main tillage crops remain above the levels observed in 2008 and 2009 except potatoes, following relatively higher rates applied in both 2010 and 2011. 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 2012 on winter wheat, potatoes and oilseed rape all decreased. Rates on winter barley and sugar beet increased by 5 kg/ha and 9 kg/ha respectively. The proportion of crop area (for tillage crops) receiving a straight nitrogen application decreased by 1% to 83%, with modest decreases on wheat, spring barley and potatoes. Dressing cover percentages were increased slightly on winter barley and sugar beet in 2012. Overall rates of compound nitrogen applied in 2012 decreased by 1-2 kg/ha since 2011 on major tillage crops, the exception being spring barley where the rate increased by 5 kg/ha. Dressing cover percentages for compound fertiliser decreased on all the major tillage crops, except wheat where the percentage was unchanged and for spring barley and sugar beet which had modest increases in 2012.



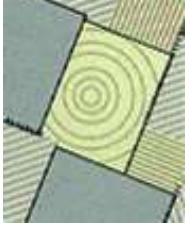
- The 2 kg/ha decrease in overall total nitrogen rate on grassland was caused by a lower dressing covers and decreased average field application rates of straight N. These reductions resulted in an overall total N rate of 55 kg/ha for grassland in 2012.

Phosphate and potash

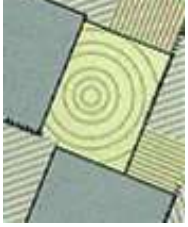
- Phosphate and potash are applied in fertilisers and manures, particularly to replace the quantities removed in harvested crops. They move only slowly in the soil and most British soils can hold large quantities of these nutrients in forms that are readily available for crop uptake over several years. Consequently managing the supply of these two nutrients for optimum yield is based more on maintaining appropriate amounts in the soil for the needs of the rotation than on those of an individual crop. The timing of maintenance application tends to be less time critical compared to nitrogen or sulphur, and a consequent lack of urgency may help to explain the trend seen for overall declining dressing cover on combinable crops, especially in England.
- Overall phosphate (P_2O_5) use on tillage crops and grassland in 2012 decreased by 2 kg/ha to 17 kg/ha. This continues the gradual decline observed since 2004. The average field rate on tillage crops decreased by 1 kg/ha to 59kg /ha, but was unchanged on grass at 22 kg/ha. The proportion of land receiving a phosphate dressing decreased for tillage crops, but remained the same as 2011 for grassland. In 2012, 47% of all tillage crops and 41% of grassland received a phosphate application, giving five year means of 48% and 41%, 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 28 kg/ha for the period 2008-12. 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 9 kg/ha for the period 2008-12.
- The proportion of the area of tillage crops receiving a potash (K_2O) dressing was decreased by 3% from 2011 at 47%. This combined with slightly increased average field rate of potash in 2012 (79 kg/ha) meant the overall rate decreased by 2 kg/ha compared to last year to 37 kg/ha. The overall rate on grassland was the same as in 2011 at 12 kg/ha as a result of unchanged average rates and dressing covers.
- 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, 51 kg/ha in 2003-07 and 38 kg/ha in 2008-12. 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 2012. Overall potash rates were relatively stable at 31-33 kg/ha during the mid 1980s to early 1990s but, since then, have tended to decline despite occasional year-on-year increases being recorded.

Sulphur

- Sulphur is an essential plant nutrient and is a component of most proteins as well as activating certain enzyme systems. In the past sulphur demand was satisfied through atmospheric deposition but this has declined significantly. Therefore there is a need for sulphur application to crops and grass and it is often applied in the sulphate form together with nitrogen fertilisers. Crops such as oilseed rape are particularly sensitive to sulphur deficiency and consequently require relatively high input of sulphur where it is additionally used in the formation of natural defence chemicals against pest attack. Sulphur can also be used as a soil acidifier for potatoes which can offer some protection against scab.
- 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. 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 2012 cereals sulphur dressing covers were in the 45%-52% range. The 73% dressing cover for oilseed rape was a 3% increase from 2011.



- In 2012, 25% of all crops and grass received a dressing of sulphur, this figure was 47% for tillage crops. On tillage crops the overall application rate for sulphur was 29 kg/ha, an increase of 3 kg in comparison to last year. Applications on grass were consistent with 2011 at 2 kg/ha, this low overall rate is caused by the low dressing cover, with only 7% 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. It includes estimates of total fertiliser which are given in Table B2.5. These data are derived from BSFP findings, confidential trade and sales data and HMRC import/export statistics. 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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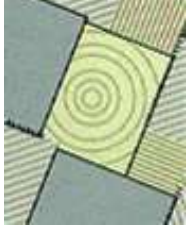
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

[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

This survey is based on a sample of holdings in order to reduce burdens and manage resources. 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. These smaller farms account for a significant proportion of the number of holdings but a much smaller proportion of the area of crops and grass. At Great Britain level, holdings below this size account for 4% of the total crop area and 10% of the total grass area. Further information is provided in Appendix 1.3. Using this threshold reduces the number of farms which need to be sampled so reducing burdens and costs without significant adverse impact on the quality of the data. The data for the medium and large farms will be representative of the very small farms which are excluded, meaning that the overall figures are representative of all farms. Standard errors are reported in Appendix 1.1.

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.

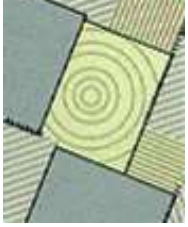
The target sample size is 1500 farms. This sample size has been designed in order to achieve a statistically representative sample at the national level. The farms are allocated to each of the combinations of farm type and size in proportion to the total area of crops and grass recorded in the June Survey (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 1,409 holdings in 2012. 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 these 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 2012, 73% of the sample had responded in a previous year. The profile of the panel in terms of farm size was 77% >200ha, 73% 100-200ha, 70% 50-100 ha and 61% >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 2012 survey, England & Wales

	farm holdings in population in 2011	total crops and grass in 2011 (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	18,391	7.2	0.48	89	103	0.56
51-100 ha	16,257	13.7	1.04	168	167	1.03
101-200 ha	11,066	17.8	1.98	219	208	1.88
200+ ha	4,516	17.8	4.85	219	220	4.87
Total livestock & mixed	50,230	56.4	1.38	695	698	1.39
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	6,908	2.7	0.48	33	34	0.49
51-100 ha	6,118	5.2	1.04	64	59	0.96
101-200 ha	5,919	9.9	2.06	122	117	1.98
200+ ha	5,347	24.4	5.62	301	238	4.45
Total crops	24,292	42.2	2.14	520	448	1.84
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	691	0.3	0.89	6	4	0.58
51-100 ha	363	0.3	1.98	7	3	0.83
101-200 ha	205	0.3	3.95	8	10	4.88
200+ ha	112	0.6	12.11	14	5	4.46
Total horticulture	1,371	1.4	2.55	35	22	1.60
Total for England & Wales	75,893	100		1,250	1,168	1.54

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2011*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2011*

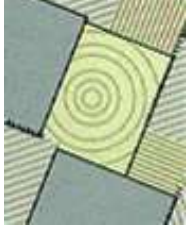


Table A2.2 Derivation of the stratified random sample for the 2012 survey, Scotland

	farm holdings in population in 2011	total crops and grass in 2011 (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	1,199	2.5	0.51	6	7	0.58
51-100 ha	1,439	6.3	1.09	16	14	0.97
101-200 ha	1,374	11.8	2.15	29	31	2.26
200+ ha	740	15.2	5.13	38	31	4.19
Total cereal/general	4,752	35.7	1.88	89	83	1.75
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	2,934	5.9	0.51	15	15	0.51
51-100 ha	3,075	13.5	1.10	34	36	1.17
101-200 ha	2,536	21.2	2.09	53	49	1.93
200+ ha	1,151	23.6	5.13	59	58	5.04
Total livestock & mixed	9,696	64.3	1.66	161	158	1.63
Total for Scotland	14,448	100		250	241	1.67

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2012 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.

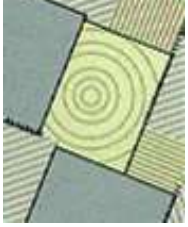
Official quantities of nitrogen, phosphate and potash fertiliser consumed annually in the UK since 1965 are shown in Table B2.5. These data are based on BSFP findings and confidential trade and sales data which are contributed by AIC industry members who represent over 90% of the market. They are compiled by the Agricultural Industries Confederation in conjunction with Defra. Further information is provided in Section 2.5.

A2.3 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 2011*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2011*



A2.4 ACCURACY AND RELIABILITY OF THE INFORMATION

The use of sampling in this survey means that there will be certain limitations associated with the data associated with this. The sampling methodology used is described more fully in Section A2.1 but essentially uses a random stratified sampling strategy approach, with an element of a core panel, to obtain a representative sample. A response rate of 53% was achieved in 2012. Sampling errors arise because even with careful selection, the sample cannot be exactly representative of all the population. The size of the sampling error will depend on the size of the sample (the larger the sample the smaller the error) but also on the variance of the data. An indication of the extent to which the sample result deviates from the population can be obtained from measuring the standard error associated with the data.

A fuller description of this standard statistical measure with the sampling variation/standard errors for the main arable crops, all tillage crops and all grass are reported in Appendix 1, Table App1.1. These can be used to help judge whether apparent changes may be real or attributable to sampling variation alone. The standard errors are relatively small for all tillage crops, all crops and the main arable crops of wheat, oilseed rape and barley. The standard errors are higher for sugar beet and potatoes where sample sizes (crop area, number of respondents) are smaller.

Figures reported for some of the smaller crops, where the sample size is relatively low, need to be treated with appropriate caution. Sample size information is provided in the tables in Section C and help to provide an indication of reliability. For crops where the sample size is relatively small it is advisable to use data from several years and to assess trends over a longer time period rather than just considering year on year changes.

For potatoes in particular, part of the reason for apparent fluctuations in estimates of nutrient application rates may be because fewer numbers of fields of potatoes are covered by the Survey than would be expected from a sample 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.

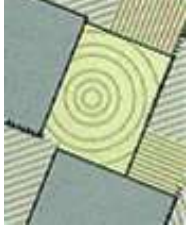
The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 9.2 million hectares in England and Wales and about 1.9 million hectares in Scotland. The estimates of the average 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.

Additionally, the survey design has been constructed to measure use of manufactured fertilisers so may not be wholly representative of manure use so some of these data, especially where sample sizes are small, need to be treated with caution.

A2.5 METHODOLOGY FOR TOTAL FERTILISER USE

Official quantities of nitrogen, phosphate and potash fertiliser consumed annually in the UK since 1965 are shown in Table B2.5. These data are based on BSFP findings, HMRC import data and confidential trade and sales data which are contributed by AIC industry members who represent over 90% of the market. They are compiled by the Agricultural Industries Confederation with input and peer review by an expert group convened by the AIC and in liaison with Defra.

It would be possible to use BSFP data alone to estimate total fertiliser use by taking the average rate for each individual crop and multiplying by the June crop area estimate and summing these to give an overall usage. However the relatively low coverage of the BSFP survey for some crops, means that the alternative approach of combining BSFP data with trade and sales data provides more robust total usage estimates than using BSFP data alone. This method also takes into account use on small farms (<20 ha) and use in Northern Ireland.



The AIC survey their members (16 businesses) monthly to collect information on fertiliser deliveries. The BSFP fertiliser statistics published and used in the industry and agricultural sector are by fertiliser year (growing season, July to June), not by calendar year. They are available at the AIC website.

Individual returns are quality assured by trend analysis against historic data and also against the aggregate trend. Any omitted data or anomalous figures outside trend or other pre-defined limits are checked and followed up, usually by contacting the survey respondent.

The AIC also purchase monthly HMRC trade statistics on imports and exports of fertilisers; these data are actively used and scrutinised, and where appropriate challenged by the trade. Twice a year, in December and June, and on an annual basis, aggregated figures for total fertiliser deliveries for the main types of fertiliser are calculated, together with nutrient contents. These are assessed with the import and export figures to derive the base total fertiliser usage figures. The N:P:K ratio from the BSFP survey is compared with the AIC derived figures to confirm the nutrient quantities relative to each other. Further small adjustments may be made based on other confidential information on stocks or non-fertiliser use of imported urea.

These AIC usage figures are compared to usage figures derived from BSFP and June crop area figures and the relationship between the ratios of N, P and K from both sets of data are checked and compared. Any inconsistencies or anomalies identified in the data are identified and followed up and any necessary corrections are made to ensure comparability and consistency across all data.

Each year the AIC figures are reviewed and quality assured for credibility and consistency across sources by a group of experts contributing knowledge on production, use and trade. The final agreed aggregated total UK usage figures are subject to independent peer review and checked for consistency and trend analysis, taking into account known agronomic and market factors.

The total fertiliser use is then split by country. The figures for Northern Ireland are taken from their fertiliser survey and the remaining GB figures are split between England plus Wales and Scotland by applying the proportions derived from the BSFP data. The NI Survey provides data by quarter amalgamated by calendar year.

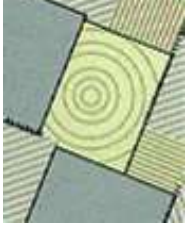
A2.6 REVISIONS

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.

During the 2012 data validation process we identified an error related to the weight/volume conversion factor used for liquid nitrogen fertilisers. This has been corrected and revisions to the data have been made back to 2004 (earliest year for which full raw data were available for revision). This has resulted in revisions to the data on nitrogen use and revisions have been made to the relevant tables in Section B and the datasets which are available on the website (wherever crop definitions permit) back to 2004. The exceptions are potatoes, and milling/malting wheat and barley where it was only possible to revise the data back to 2008. At the overall total use on all tillage and grass, the scale of the revisions is relatively small, typically around 2 kg/ha lower. At an individual crop level, rates were around 4-5 kg/ha lower for the major arable crops of wheat and oilseed rape. The changes were higher for crops such as potatoes and vegetables but the standard errors are higher for these crops, related to the relatively small sample sizes**.**

An error was made in Table B2.3 with the 2011 phosphate application rate for Great Britain in this report. This has been corrected.

Additionally there have been some revisions to the quantities of nitrogen used in 2008 and 2009 in Table B2.5. These data were extremely difficult to determine at the time due to the price spike and exceptional stockholding on farm. These data have been reviewed and revised in the light of data for following years which saw a return to more typical stock levels. Provisional 2011 figures for nitrogen have also been finalised.



A2.7 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 2011 to autumn 2012, corresponding to the 2012 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 2011. 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.

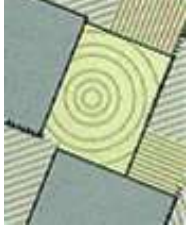
5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser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

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

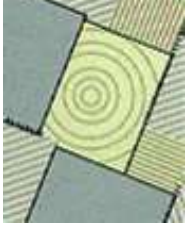
   https://www.gov.uk/structure-of-the-agricultural-industry-survey-notes-and-guidance#june-survey-of-agriculture-and-horticulture-in-england

   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 2012. 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.



A2.8 TYPES OF FERTILISER

Of the 16 essential plant nutrients, the four key ones required in relatively large amounts in order for crops to achieve their maximum yield potential are nitrogen, phosphorus, potassium and sulphur. Where nutrients are not available in sufficient quantity in the soil, fertiliser products are applied to supply the nutrient needs of the plant. Plant roots take up the nutrients dissolved in the water in the soil. The nutrients must be in the correct chemical form so that they are in a suitable water soluble form in order for plants to be able to use them.

There are two broad types of fertiliser. Manufactured fertilisers tend to be relatively concentrated and supply essential nutrients in a chemical form which are immediately available for plant use. The other type is organic fertilisers which can be plant or animal based such as manure, slurry, compost or poultry litter. They are in their natural form or have undergone minimal processing. They are usually less concentrated than manufactured fertilizers, and often the nutrients they contain may need further breaking down in the soil by bacteria and other soil organisms before they are in a form available to plants. The chemical composition can vary greatly and they tend to be slower acting and less predictable in their action.

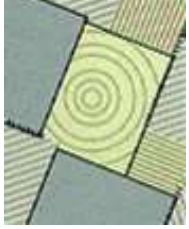
Nitrogen is important for building DNA and proteins in plants. It encourages growth of stems and leaves by promoting protein and chlorophyll. Provided there are adequate supplies of water and other nutrients, nitrogen usually has a large effect on crop growth, yield and quality. Whatever the source, to be usable by plants it has to be in the form of inorganic ammonium or nitrate ions. The main forms of inorganic nitrogen fertilisers are ammonium nitrate, urea, ammonium phosphates and ammonium sulphate.

Phosphorus is essential for photosynthesis and respiration. It promotes early root formation and growth and enhances seed and fruit production. It is also important for energy production and storage. In the context of fertilisers it is measured and defined as P_2O_5. Phosphate fertilisers include ammonium phosphate and superphosphate. The majority of phosphorus in most soil is in essentially insoluble forms, and unavailable to plants. Phosphorus is very immobile in soil and the forms that are created and their availability are dependent on factors such the soil pH, temperature and moisture. Plant roots take up nearly all phosphorus as either the primary or secondary orthophosphate anion ($H_2PO_4^-$ or HPO_4^{-2}, respectively). Generally the maximum availability of phosphorus occurs in soils within a pH range of 6.0-7.0.

Potassium contributes to many plant functions apart from managing the water status, including shoot and root tip growth, cell extension, photosynthesis and the reduction of drought and disease stress. It is used in the process of building and transporting starches, sugars and proteins so is important for grain and fruit yield. Potassium chloride (commonly called muriate of potash) is the most common form of potassium fertiliser used in agriculture. Other forms include potassium sulphate, potassium magnesium sulphate and potassium nitrate. In the context of fertilisers it is measured and defined as K_2O. It is usually taken up from the soil in greater quantities than the other main fertilisers and crops which are harvested green such as grass and green vegetables will remove relatively large quantities of potassium from the soil.

Sulphur is an essential plant nutrient. It is a component of most proteins and it activates certain enzyme systems. In the past sulphur demand was satisfied through atmospheric deposition. With the significant decline of sulphur from the atmosphere, there is a need for sulphur application to crops and grass and it is often applied together with nitrogen fertilisers. Crops such as oilseed rape are particularly sensitive to sulphur deficiency and consequently require a relatively high input of sulphur.

More details are provided in the Fertiliser Manual (RB209) which is available at on the Defra website.



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 2010/11 and 2011/12, 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 2012, of which 4.7 million hectares (42%) were cultivated for tillage cropping and the remainder, 6.4 million hectares, were grassland (excluding rough grazing).

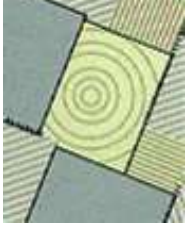
The Single Farm Payment was introduced on 1 January 2005, replacing all the previous main Common Agricultural Policy (CAP) payment schemes with a single payment. To obtain this single payment, farmers must demonstrate compliance with a number of measures designed to protect the environment. One potential 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 6 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, 2011 – 2012

Crops	June 2011 '000s ha	June 2012 '000s ha	% change since 2011	% change since 2007	2012 crop areas as % of total tillage area
Wheat	1958	1982	1.2	9.7	42.3
Barley – winter	352	379	7.6	0	8.1
– spring	594	597	0.5	20.1	12.7
Total cereals[1]	*3037*	*3105*	*2.2*	*9.5*	*66.3*
Oilseed rape – total	704	754	7.1	25.5	16.1
Sugar beet	113	120	6.2	4.0	2.6
Potatoes[2]	141	145	2.8	7.4	3.1
Linseed	36	28	-22.2	54.5	0.6
Peas/beans[3]	155	119	-23.3	-26.1	2.5
Maize/other fodder	227	221	-2.7	3.8	4.7
Vegetables	127	122	-4.0	1.7	2.6
Total tillage[4]	*4606*	*4684*	*1.7*	*9.0*	*100.0*
Set-aside and bare fallow[5]	154	152	-1.3	-74.8	
Grassland					2012 grass areas as % of total grass area
Less than 5 years old	1148	1223	6.5	16.0	19.2
5 years and older	5230	5154	-1.5	-2.6	80.8
Total grass[6]	*6378*	*6376*	*0*	*0.5*	*100.0*
Total crops and grass[7]	*10984*	*11060*	*0.7*	*3.9*	

[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 and 2012 Single Payment Years 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



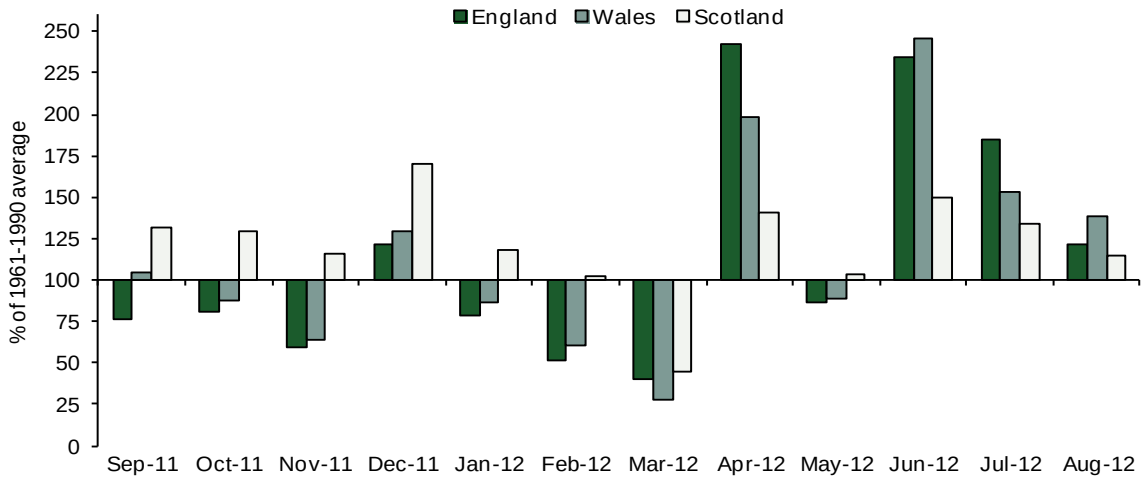
Comparing the 2011 and 2012 cropping years, the total area of uncropped land (bare fallow and set-aside) fell by 1.3% in 2012. This was predominantly caused by a reduction in land left as bare fallow in England, with the obligatory set aside area remaining at zero in all countries. The total area under tillage crops was increased slightly by 1.7% and cereals increased by 2.2%. The increase in the winter barley area reversed the trend of decline in recent years, whilst the area of oilseed rape continued its rise. The peas and bean area decreased by 23.3% against 2011, and this area has been declining since 2009. The areas of linseed, fodder crops and vegetables were also reduced.

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.

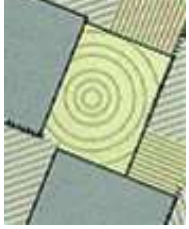
In the autumn of 2011 rainfall was 97% of the long term average. There were large variations acoss the country, being relatively dry in the south east and much wetter in the north west and Scotland. The winter period (December – February) was much milder than the previous three winters, although the last few days of January saw an onset of a cold spell with frosts and snowfalls across England. Winter total rainfall was close to average, but had marked regional variations. North west Scotland received 130% of normal, with much of east Scotland and England receiving 75% of normal. Spring temperatures were variable, with March the warmest since 1957 and April the coldest since 1989. The wet spring in the south and east brought respite from a drought situation and April was the wettest on record. It was also an exceptionally wet summer, with only 1912 seeing more rainfall. In July 150% of normal rainfall fell widely, the drier exception being north west Scotland. The summer was a little warmer than 2011, but otherwise was the coolest since 1998. It was not apparent that these wet conditions changed the timing of fertiliser applications, with the pattern being very similar to that observed in 2011 (Table GB3.0).

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 2012 the balance between winter and spring sown crops was similar to that in 2011. The impact of all these factors on fertiliser use are discussed in Section B of this report.

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



SECTION B

COMMENTARY ON FERTILISER USE IN GREAT BRITAIN

This commentary refers to rates of application in mainland Britain of fertilisers containing nitrogen (N), phosphate (P_2O_5), potash (K_2O) and sulphur (SO_3) on tillage crops and grassland (excluding rough grazing). Section B1 of the report covers the five-year period 2008-12. 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 2011-12 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 2012 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 2008/9. The 2012 overall rate for all crops and grass is 95 kg/ha. Overall rates for phosphate and potash declined until 2009, then stabilised, with slight reductions in 2012 to 17 kg/ha and 23 kg/ha respectively. 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 2008 – 2012

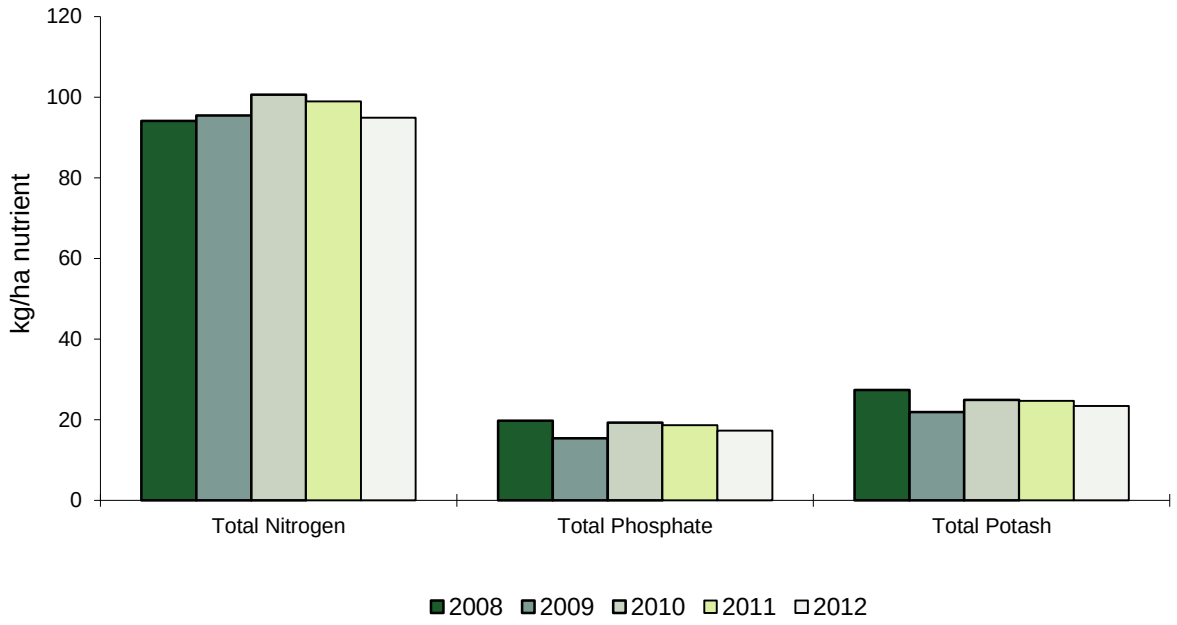


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2008 – 2012

Total nitrogen

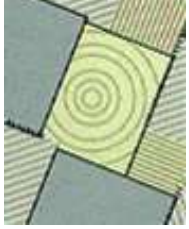
	tillage crops	*grass*	*all crops and grass*
2008	137	55	94
2009	137	57	95
2010	145	63	101
2011	146	57	99
2012	144	55	95

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2008	122	23	70
2009	123	28	74
2010	131	30	77
2011	132	28	77
2012	131	25	72

Compound nitrogen

	tillage crops	*grass*	*all crops and grass*
2008	15	32	24
2009	14	29	22
2010	14	33	24
2011	14	29	22
2012	13	31	23

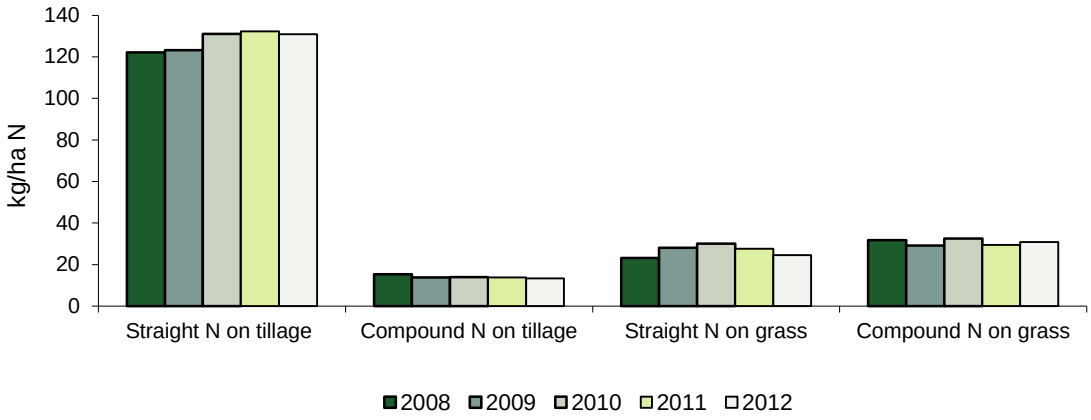


B1.1.1 Nitrogen

All crops and grassland

The 4 kg/ha decrease in total nitrogen use on all crops and grassland (Figure B1.1) was caused by a decrease in the overall rates on both tillage crops and grass. On grass the overall application rates reduced for straight N by 3 kg/ha, whilst compound N increased by 2 kg/ha. On tillage crops the rate of straight N decreased by 1 kg/ha to 131 kg/ha whilst the rate of compound N decreased by 1 kg/ha. The overall rate of compound N on all crops and grass is stable at 22-24 kg/ha over the five year period 2008-12.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2008 – 2012



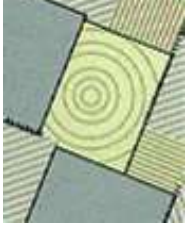
Tillage crops

Straight N continues to be the main source of nitrogen on tillage crops, with the proportion of tillage area receiving a straight nitrogen dressing decreasing by 1% to 83% in 2012. This small decrease in dressing cover contributes to the decrease in the overall application rate as the average field application rate on tillage reduced by 2 kg/ha to 157 kg/ha in 2012.

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 82% 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 2012 the overall nitrogen application rate of 55 kg/ha was the lowest reported for the whole survey period since 1983 (see section B2). The 2 kg/ha decrease to the overall N application rate in 2012 was due to a lower proportion of the grass area receiving a dressing of straight N as the compound N dressing cover was the same as in 2011. The average field rate of straight N decreased by 4 kg/ha to 94 kg/ha, whilst the compound N average field rate increased by 3 kg/ha to 75 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 2012 phosphate rate on tillage decreased by 1 kg/ha to 28 kg/ha, with a reduced proportion receiving a dressing (47%) and average field rate (59 kg/ha). For grassland the overall rate has been more stable, and 2012 saw an unchanged dressing cover and average field rate at 22 kg/ha. The five year means for overall phosphate rates for tillage crops and grass were 28 and 9 kg/ha respectively.

Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2008 – 2012

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2008	30	10	20
2009	23	9	15
2010	30	10	19
2011	29	9	19
2012	28	9	17

Total potash

	tillage crops	*grass*	*all crops and grass*
2008	43	13	27
2009	33	12	22
2010	38	14	25
2011	39	12	25
2012	37	12	23

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 decreased by 3% to 47%, whilst the average field rate increased by 2 kg/ha. On grass dressing cover was the same as in 2011 at 42% as was the average field rate at 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 2012 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 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.

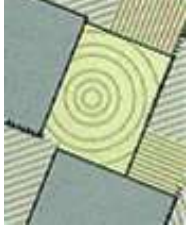


Table B1.3 Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2008 – 2012

Total nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	174	93	132	152	187	85
2009	184	99	137	162	182	91
2010	188	97	140	132	192	86
2011	188	99	138	158	192	86
2012	184	99	143	135	186	95

Straight nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	165	55	118	40	178	77
2009	177	68	127	50	175	86
2010	180	63	125	33	185	80
2011	181	67	126	48	184	78
2012	177	63	133	43	179	88

Compound nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	8	38	15	113	9	9
2009	7	31	10	112	7	4
2010	8	34	15	99	7	7
2011	7	32	12	110	8	8
2012	7	37	10	92	7	7

Total phosphate	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	27	34	35	129	29	31
2009	17	29	22	134	20	19
2010	27	35	33	118	29	28
2011	28	34	30	114	26	26
2012	25	34	30	103	25	23

Total potash	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	35	47	51	233	35	90
2009	23	41	34	233	23	72
2010	31	46	47	200	29	78
2011	33	45	46	197	27	76
2012	31	47	41	192	27	70

Total sulphur	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a,c]	*oilseed rape* [b]	*sugar beet*
2008	21	15	19		58	12
2009	18	13	22		47	18
2010	22	17	21		54	13
2011	25	16	21		61	13
2012	28	17	25		63	12

[a] Figures for maincrop potatoes include second earlies.

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

[c] Sulphur rates on potatoes are not shown as some growers apply additional sulphur to acidify the soil for this crop. These applications cannot be separated from those intended as a fertiliser nutrient.

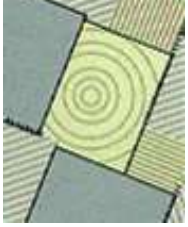


Table B1.4 Average field rates (kg/ha) on major tillage crops, Great Britain 2008 – 2012

Total nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	177	98	135	155	188	91
2009	187	102	139	174	183	94
2010	190	102	142	135	193	91
2011	190	103	139	164	192	90
2012	187	104	144	142	186	98

Straight nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	173	86	129	98	181	87
2009	184	92	134	120	179	91
2010	187	91	133	78	189	87
2011	187	90	134	87	186	85
2012	184	86	140	81	181	96

Compound nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	73	63	63	145	46	65
2009	71	60	64	133	37	39
2010	62	59	62	123	43	60
2011	68	59	66	130	38	75
2012	72	61	65	128	39	50

Total phosphate	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	60	48	56	145	60	58
2009	54	47	53	151	54	47
2010	60	49	55	135	60	57
2011	62	51	53	129	59	59
2012	61	48	57	134	57	59

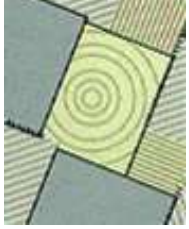
Total potash	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2008	75	62	74	247	70	112
2009	71	61	72	258	66	109
2010	72	64	73	226	67	111
2011	75	65	73	218	65	111
2012	77	63	72	247	68	110

Total sulphur	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [a,c]	*oilseed rape* [b]	*sugar beet*
2008	50	42	45		84	53
2009	45	40	48		78	78
2010	54	40	48		85	50
2011	55	39	45		86	56
2012	54	39	50		86	59

[a] Figures for maincrop potatoes include second earlies.

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

[c] Sulphur rates on potatoes are not shown as some growers apply additional sulphur to acidify the soil for this crop. These applications cannot be separated from those intended as a fertiliser nutrient.



B1.2.1 Nitrogen

Overall rates of total nitrogen (Table B1.3) decreased between 2011 and 2012 for all the major tillage crops except winter barley and sugar beet. Average field rates (Table B1.4), which are unaffected by changes in dressing cover, followed a similar pattern with increases observed for winter barley, spring barley and sugar beet.

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 2008 – 2012

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2008	196	170	101	94	119	142
2009	206	177	104	98	135	141
2010	212	179	106	96	127	149
2011	212	180	107	97	129	144
2012	217	176	110	93	129	152

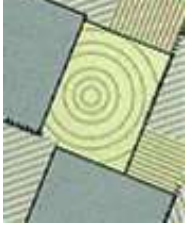
Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice[10]. Milling varieties are often grown as a second wheat and often receive extra nitrogen, 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 27% of the crop area in 2012 being grown as milling wheat (5 year mean: 31%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2008 – 2012, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
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
2012	27	73	63	37	32	68

[10] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site: https://www.gov.uk/government/publications/fertiliser-manual-rb209



Spring barley

Overall use of total nitrogen on spring barley was unchanged in 2012 at 99 kg/ha which is slightly higher than the five year mean of 98 kg/ha. The overall application rate of straight nitrogen decreased to 63 kg/ha, whilst the overall application rate for compound N increased to 37 kg/ha. This increase was caused by an increased percentage of the spring barley area receiving a dressing of compound N (60% in 2012). The average field rate for total nitrogen was 104 kg/ha in 2012, just above the five year average of 102 kg/ha.

Further analysis of the data by crop type (Table B1.5) shows the average rate applied to the spring malting crop had increased by 3 kg/ha to 110 kg/ha in 2012. For non-malting crops the nitrogen application rate decreased by 4 kg/ha to 93 kg/ha, with a five year mean of 95 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 10 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)[11]. 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 2008-12 is 59%.

Winter barley

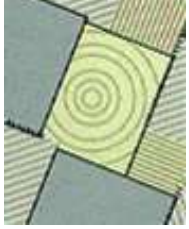
In the period 2002-08 overall total nitrogen use on winter barley decreased from year to year, down to 132 kg/ha in 2008. This rate has increased every year since except 2011 to 143 kg/ha in 2012. The straight nitrogen rate increased by 7 kg/ha whereas the compound nitrogen rate decreased by 2 kg/ha in 2012.

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 were unchanged in 2012 at 129 kg/ha with the 5 year average at 128 kg/ha. For non malting crops the average field rate increased by 8 kg/ha to 152 kg/ha in 2012 (Table B1.5), with the 5 year average being 146 kg/ha.

The higher application rates of nitrogen (five-year mean of +18 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 more 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 32% in 2012, which was typical of the recent past, with the five year mean calculated as 31%. (Table B1.6).

[11] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site: https://www.gov.uk/government/publications/fertiliser-manual-rb209



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 162 kg/ha, and in 2012 was 135 kg/ha, below the five year mean of 148 kg/ha. (Table B1.3). This decrease in 2012 is due to decreases in the average field rates of straight and compound nitrogen (Table B1.4), as well as an decrease in the area receiving straight or compound nitrogen fertiliser (53% and 72% respectively).

Oilseed rape

In 2012, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, decreased 6 kg/ha to 186 kg/ha (five year mean 188 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 6 kg/ha between 2011 and 2012, counterbalancing a similar change of the 8 kg/ha increase seen in between 2009 and 2010. The rate for the spring crop decreased by 23 kg/ha. It should be remembered that this crop represents only about 2% 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 2008 – 2012

Total nitrogen (kg/ha)

	winter oilseed rape	*spring oilseed rape**
2008	189	113
2009	187	112
2010	195	121
2011	193	142
2012	187	119

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

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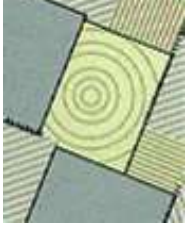
Sugar beet

The overall nitrogen use on sugar beet increased by 9 kg/ha in 2012 to 95 kg/ha, slightly over the five year mean (89 kg/ha). The proportion of crop area receiving a nitrogen dressing was 97% and this is consistent with the previous two years. The average field rate of compound nitrogen fell by 25 kg/ha, although dressing cover with compound nitrogen is low at 13% of the sugar beet area in comparison to 92% dressing cover with straight N.



B1.2.2 Phosphate and Potash

Phosphate

In 2012 the overall phosphate rate decreased on all the major tillage crops except winter and spring barley. Lower overall rates were caused by decreased average field rates all the major crops except winter barley and maincrop potatoes. (Table B1.4) Percentage dressing covers with phosphate reduced on all crops except spring barley and oilseed rape. The overall phosphate rate of 28 kg/ha for tillage crops is in line with the 2008-12 five year average.

Potash

Overall potash use on tillage crops decreased in 2012 by 2 kg/ha, to 37 kg/ha. This is in line with the trend of declining potash rates since 2008, when the overall rate was 43 kg/ha. The decrease in overall potash rate on tillage crops in 2012 was caused by a 3% reduction in the proportion of the crop area receiving a dressing, as the average field rate was slightly increased between the two years. The average field rates for potash increased on winter wheat, maincrop potatoes and oilseed rape. The average field rates decreased on spring barley, winter barley and sugar beet (by 1-2 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 2012 cereals dressing covers with sulphur were in the 45-52% range. In oilseed rape the 3% increase in dressing cover makes it highest for the period. (Table B1.8). In 2012 average field rates increased in winter barley, decreased on winter wheat, and were unchanged in spring barley and oilseed rape.

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2008 – 2012

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2008	43	42	35	70
2009	39	45	32	60
2010	42	44	42	64
2011	46	46	40	70
2012	52	51	45	73

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2008	50	45	42	84
2009	45	48	40	78
2010	54	48	40	85
2011	55	45	39	86
2012	54	50	39	86

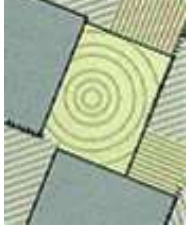


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of 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 2012 these percentage dressing increased both on cereals and oilseed rape.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2008 – 2012

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2008*	43	42	42	70
	2009	39	44	34	60
	2010	41	42	42	64
	2011	45	45	40	70
	2012	52	50	45	74
Scotland*	*2008*	48	42	27	66
	2009	54	55	30	67
	2010	56	52	41	61
	2011	58	50	39	68
	2012	61	54	44	49

* 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 2008 – 2012

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2008	23	32	55	10	13	2
2009	28	29	57	9	12	2
2010	30	33	63	10	14	2
2011	28	29	57	9	12	2
2012	25	31	55	9	12	2

Dressing cover for total nitrogen on grass was unchanged in 2012 at 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 more than three quarters of the straight N rate of 94 kg/ha.

Overall application rates for phosphate and potash on grass remained at 9 and 12 kg/ha respectively.

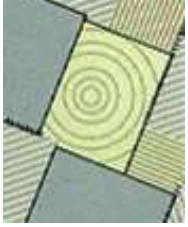


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2008 – 2012

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2008	25	42	58	42	42	5
2009	28	39	59	38	39	5
2010	29	43	63	43	44	6
2011	28	41	61	41	42	6
2012	26	41	61	41	42	7

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2008	93	77	95	24	32	33
2009	100	76	98	23	30	29
2010	104	76	100	24	32	30
2011	98	72	93	22	29	36
2012	94	75	91	22	29	32

The proportion of the grass area receiving a straight nitrogen dressing reduced by 2%, to 26% and compound N dressing cover remained the same at 41% in 2012. Dressing cover percentages of phosphate and potash were unchanged at 41% and 42% of grass area for 2012. The five year means are 43% and 42% respectively.

Average field rates for phosphate and potash remained at their lowest level for the five year period in 2012, with 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 2012 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2008 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 available estimates of grassland utilisation by area.

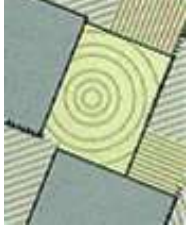
Table B1.12 Grassland utilisation (% of grass area), Great Britain 2008 – 2012

	grazed [a]	*silage* [b]	*hay* [b]
2008	95	29	12
2009	93	29	12
2010	91	31	12
2011	90	29	11
2012	90	28	10

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2012 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 2008 – 2012

Total nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2008	52	96	40	*2008*	92	120	75
2009	55	104	40	*2009*	95	124	82
2010	59	106	48	*2010*	96	127	82
2011	52	99	40	*2011*	89	121	71
2012	51	99	47	*2012*	87	117	75

Straight nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2008	22	37	21	*2008*	91	103	76
2009	27	48	23	*2009*	98	113	88
2010	29	50	24	*2010*	103	116	81
2011	26	46	21	*2011*	95	115	75
2012	22	43	25	*2012*	91	105	79

Compound nitrogen

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2008	30	59	19	*2008*	73	97	65
2009	28	55	17	*2009*	73	96	67
2010	30	55	24	*2010*	72	97	71
2011	26	53	18	*2011*	68	94	55
2012	28	56	22	*2012*	71	97	64

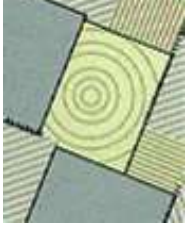
In 2012 the overall total nitrogen rate for the grazed category decreased by 1 kg/ha to 51 kg/ha, with the rate on the silage category unchanged at 99 kg/ha. Average field rates of nitrogen fell by 2 kg/ha and 4 kg/ha respectively.

Overall application rates and average field rates of straight nitrogen decreased on grazed and grass for silage in 2012. Rates on grass for hay increased, but these should be treated with caution, due to the relatively low number of fields managed in this way. Compound nitrogen rates increased slightly for all categories of grass, but the long term trend remains downward. The five year means for the overall compound nitrogen rate are 28, 56 and 20 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 2008 – 2012

Total phosphate

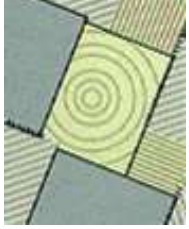
	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2008	9	18	7	*2008*	23	30	23
2009	8	15	7	*2009*	22	28	26
2010	10	16	10	*2010*	23	29	28
2011	8	15	7	*2011*	21	27	21
2012	8	15	8	*2012*	20	27	21

Total potash

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2008	12	28	8	*2008*	30	44	27
2009	11	25	9	*2009*	29	42	33
2010	13	26	12	*2010*	30	44	33
2011	11	24	10	*2011*	27	41	27
2012	11	25	9	*2012*	27	41	26

Overall phosphate rates were unchanged in 2012 and are at the lowest for the five year period (Table B1.14). The corresponding five-year means for grazed grass, silage and hay were 9, 16 and 8 kg/ha, respectively. Average field rates decreased by 1 kg/ha on grazed grass and were unchanged on grass for silage.

Overall potash rates in 2012 were the same as the previous year on grass that was grazed and decreased by 1 kg/ha on grass cut for hay. The rate on silage grass increased by 1 kg/ha, but the average field rate was the same at 41 kg/ha.



B1.3.3 Sulphur

In 2012, only 7% of the total grassland area received a sulphur dressing (mean 6% for 2008-12 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 the silage and hay categories increasing in 2012.

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 2008 – 2012

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2008	4	9	4	5
2009	5	12	5	5
2010	6	11	5	6
2011	6	11	3	6
2012	6	14	7	7

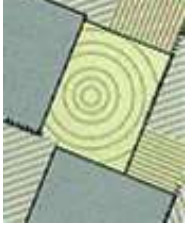
Average application rate per year (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2008	33	33	47	33
2009	29	29	26	29
2010	29	32	36	30
2011	36	39	39	36
2012	31	34	23	32

Estimated average field rates of sulphur application peaked for grazed and silage grass in 2007 and for hay in 2008. In 2012 average field rates decreased on all types of grass management systems. The five year means are 32, 33 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.



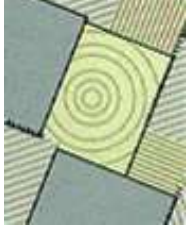
B2 LONGER TERM TRENDS FOR GREAT BRITAIN

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 1973 - 2012 and Scotland and Great Britain 1983 – 2012

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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	150	133	148	73	93	77	108	107	108
2005	149	132	147	72	84	75	109	102	108
2006	145	119	142	69	86	72	106	98	104
2007	148	119	144	64	72	65	106	89	103
2008	141	109	137	52	66	55	97	81	94
2009	140	111	137	54	69	57	98	84	95
2010	149	113	145	62	64	63	105	80	101
2011	150	119	146	57	59	57	103	79	99
2012	147	121	144	54	60	55	98	79	95



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 2012 is just outside that range, with the overall rate of nitrogen on tillage crops for Great Britain being 144 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 85 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 – 2012

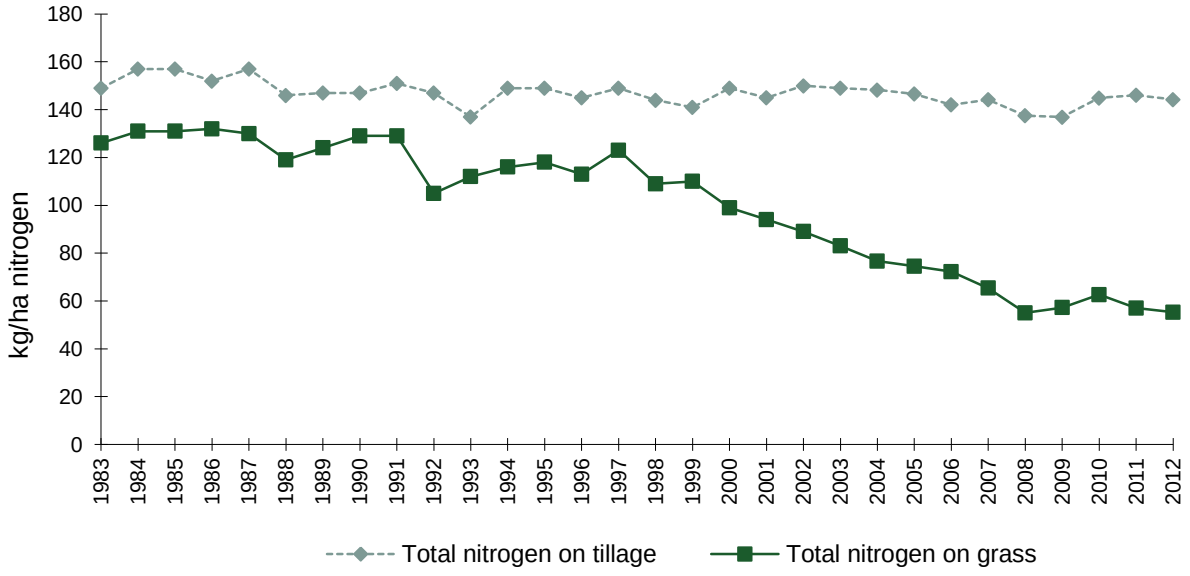
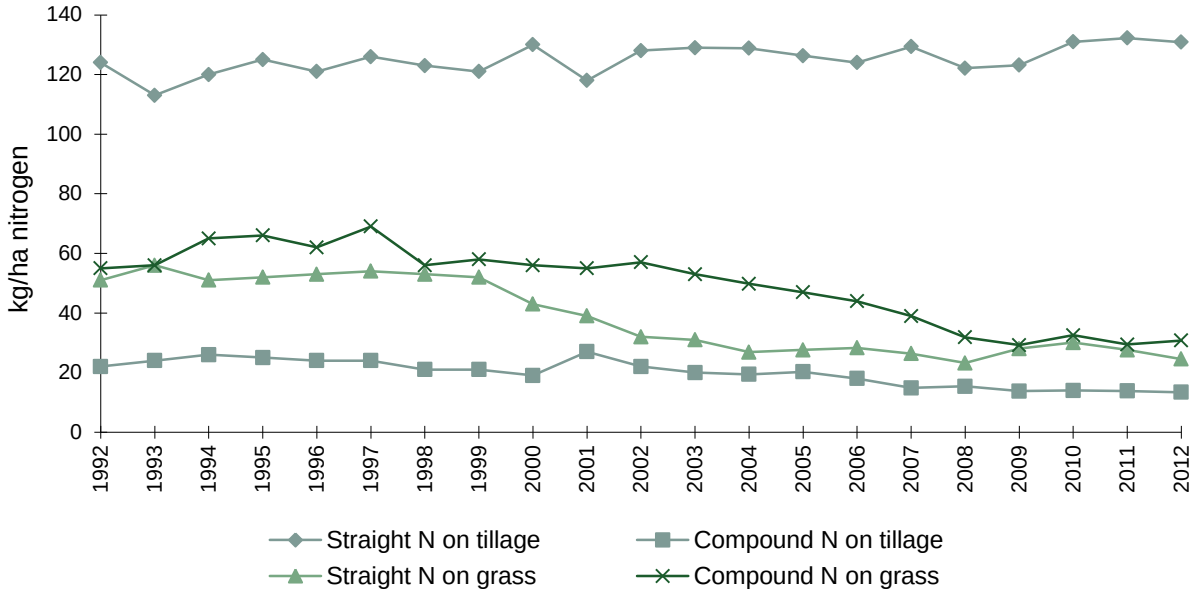


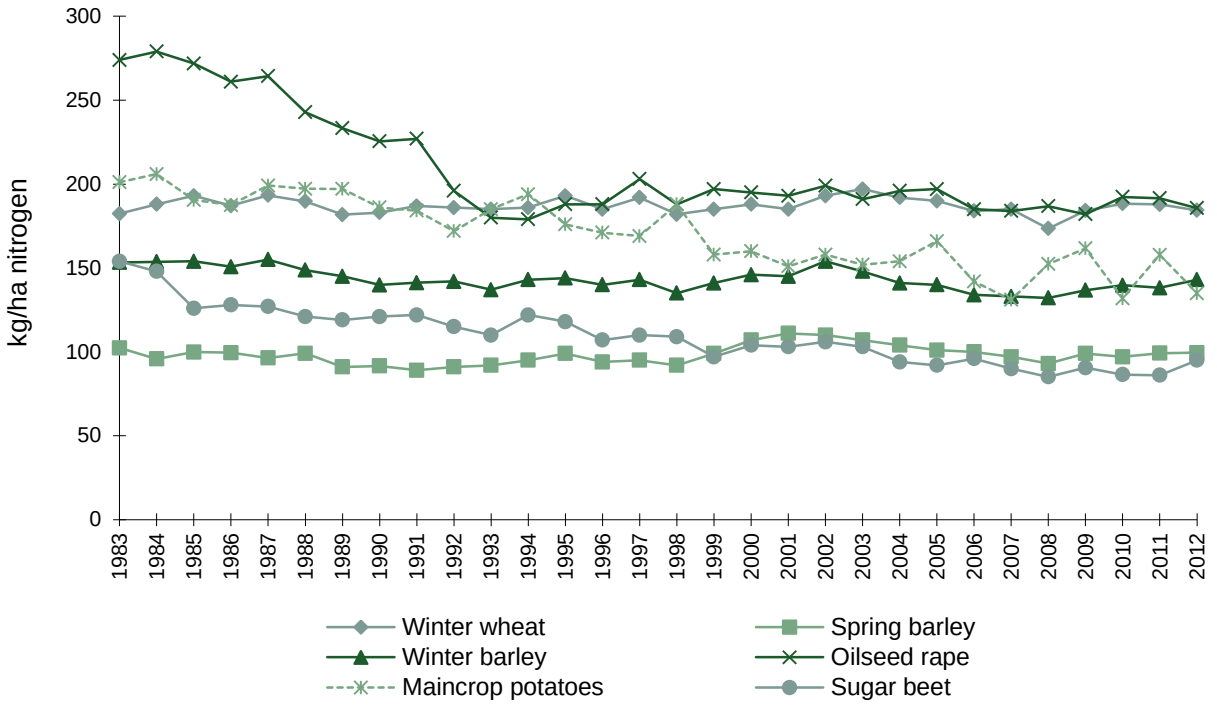
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2012

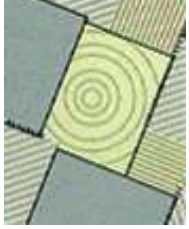


B2.1.1 Nitrogen use on major tillage crops

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 – 2012





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.

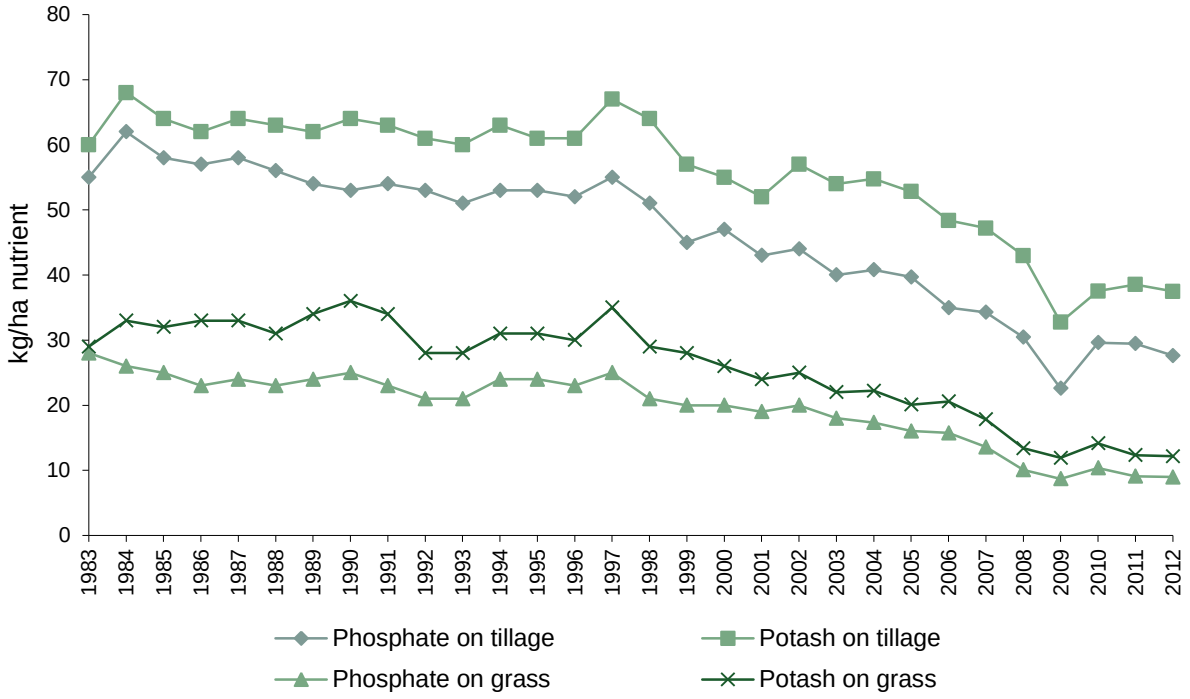
Table B2.2 Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape and average application rate (kg/ha) for winter oilseed rape, England & Wales 1984 – 1998 and Great Britain 1999 – 2012

	winter wheat	*winter barley*	*winter oilseed rape*	
	dressing cover	*dressing cover*	*dressing cover*	*application rate*
England & Wales				
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	40
2006	5	7	28	34
2007	3	5	27	41
2008	3	6	31	33
2009	2	3	26	31
2010	2	7	29	33
2011	2	3	35	29
2012	2	5	31	27

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 – 2012



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 28 kg/ha in 2008-12. The dip in use in 2009 was caused by a major price increase for the nutrient. The 2012 rate of 28 kg/ha is 1 kg/ha lower than that reported for 2011, 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 2012, 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 9 kg/ha for the period 2008-12.

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 2008 and 2012, overall potash use on tillage crops averaged 38 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 2012. 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.

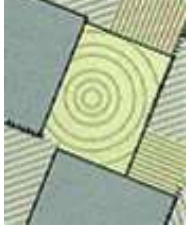


Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1969 - 2011 and Scotland and Great Britain 1983 – 2012

	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	25	40	28
2005	37	56	40	15	22	16	25	35	27
2006	32	53	35	14	22	16	23	33	25
2007	32	53	34	12	19	14	22	32	23
2008	28	50	30	9	16	10	18	28	20
2009	19	49	23	7	15	9	13	27	15
2010	27	50	30	9	16	10	18	27	19
2011	27	50	29	8	14	9	17	25	19
2012	25	50	28	8	14	9	16	25	17

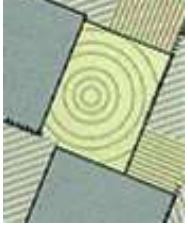
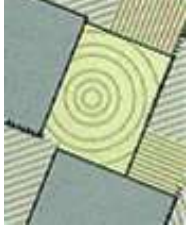


Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2011 and Scotland and Great Britain 1983 – 2012

	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	52	72	55	21	30	22	35	46	37
2005	51	65	53	19	26	20	34	40	35
2006	46	68	48	19	28	21	32	42	33
2007	44	69	47	17	23	18	30	40	32
2008	40	67	43	12	20	13	26	37	27
2009	29	64	33	10	20	12	19	35	22
2010	33	67	38	13	19	14	23	35	25
2011	35	65	39	11	16	12	23	32	25
2012	34	68	37	11	17	12	22	33	23

Overall rates of phosphate and potash applied to tillage crops are more than three times those used on grassland. However there is greater use of manures on grassland (34% cover) than on tillage crops (24% cover).



B2.2.1 Phosphate and potash use on major tillage crops

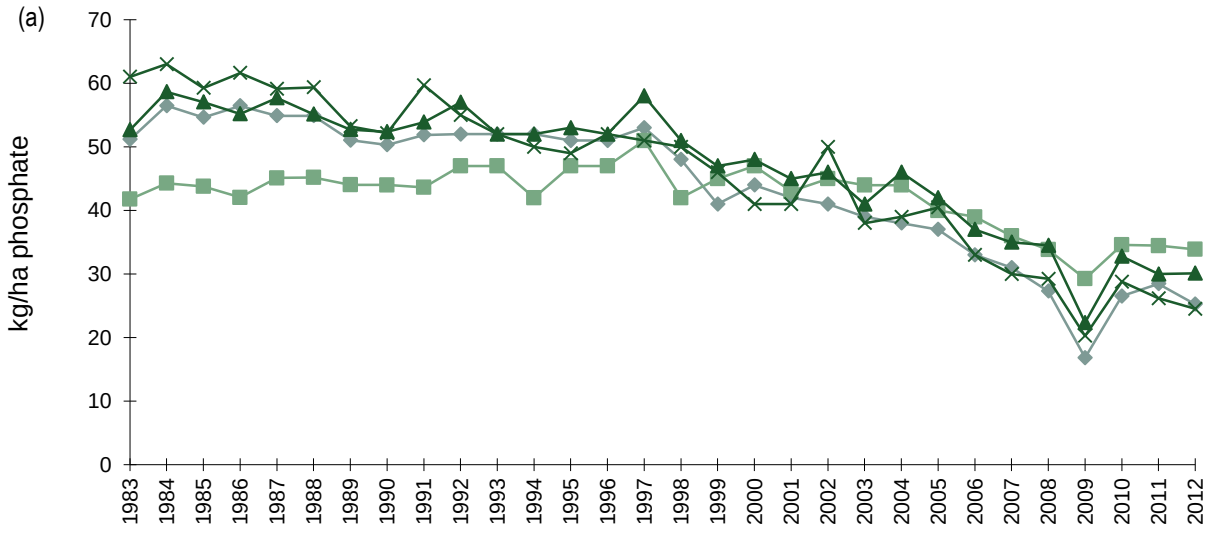
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

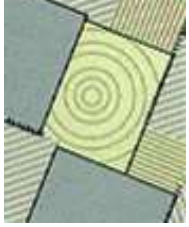
Phosphate use on most major tillage crops has shown a gradual net decline over the survey period. The net decline of phosphate on potatoes has been more dramatic, with a rate of 103 kg/ha reported in 2012. Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, 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 barley, but the rate on winter wheat fell by 3 kg/ha in 2012. The 5 year means are 25 and 30 kg/ha for winter wheat and winter barley respectively for the 2008-12 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, and a decrease of 1 kg/ha in 2011. In 2012 the rate remained the same at 34 kg/ha.

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 2008-12 at 26 kg/ha for oilseed rape and sugar beet. In potatoes, the rate has fluctuated between 103 and 134 kg/ha for this period.

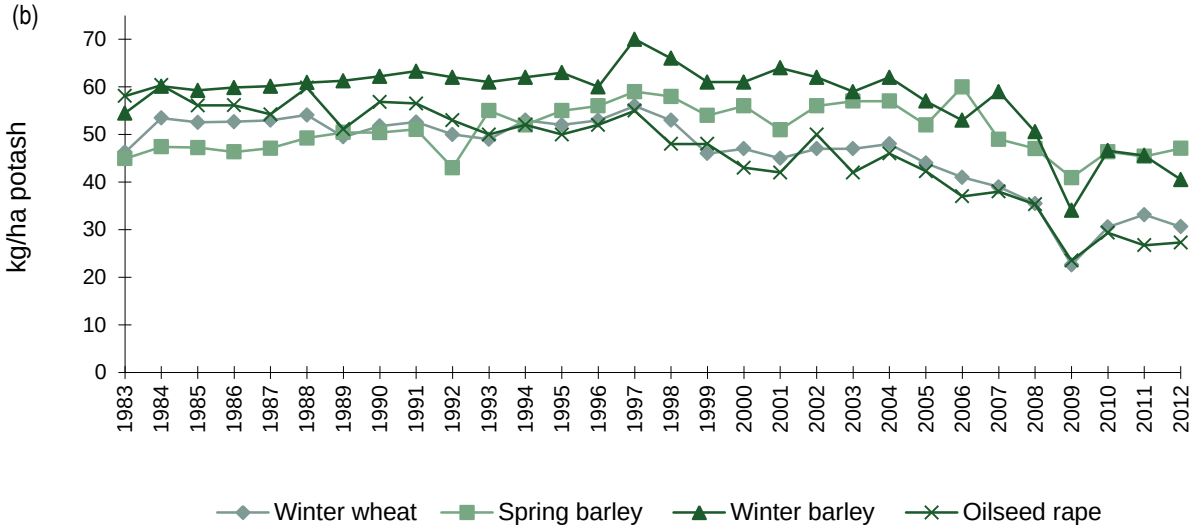
On winter wheat, the mean overall potash rates were very similar for the five year periods 1983-87, 1988-92 and 1993-97 at 52, 52 and 53 kg/ha, respectively but there was a reduction to 48 kg/ha in 1998-02. For barley, the same periods have seen an increase in potash use from 59 kg/ha (winter barley) 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 2008-12 indicate that the downward trend is continuing, despite the large falls in 2009, subsequent recovery in 2010 and reductions in 2012 (five year means: 28, 211, 77 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 – 2012

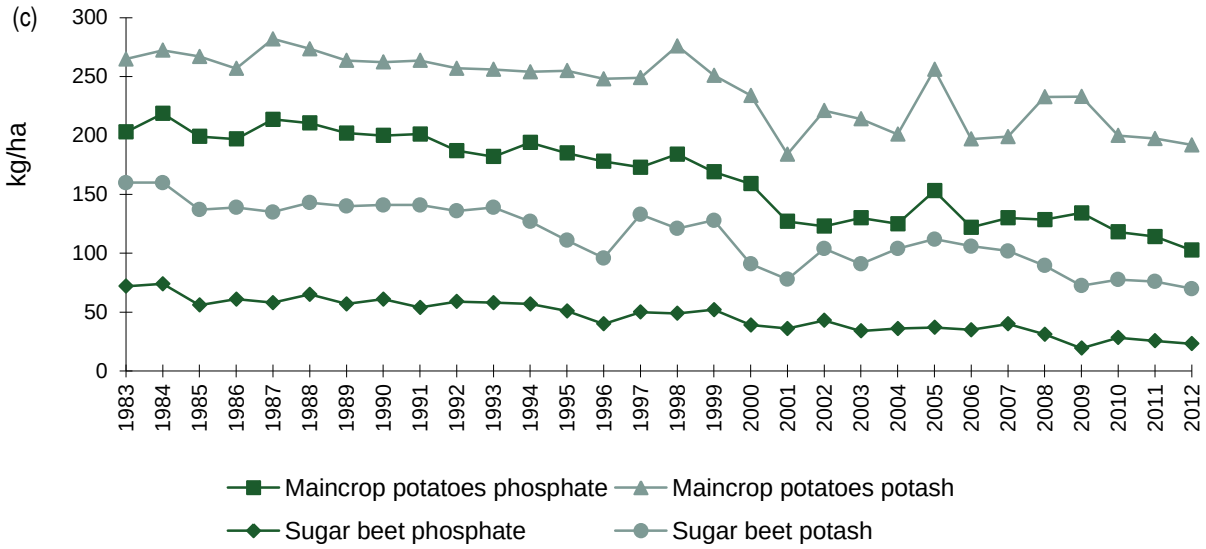


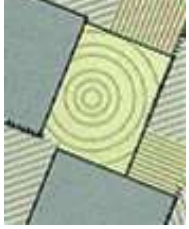


(b)


kg/ha potash
70
60
50
40
30
20
10
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Winter wheat
Spring barley
Winter barley
Oilseed rape

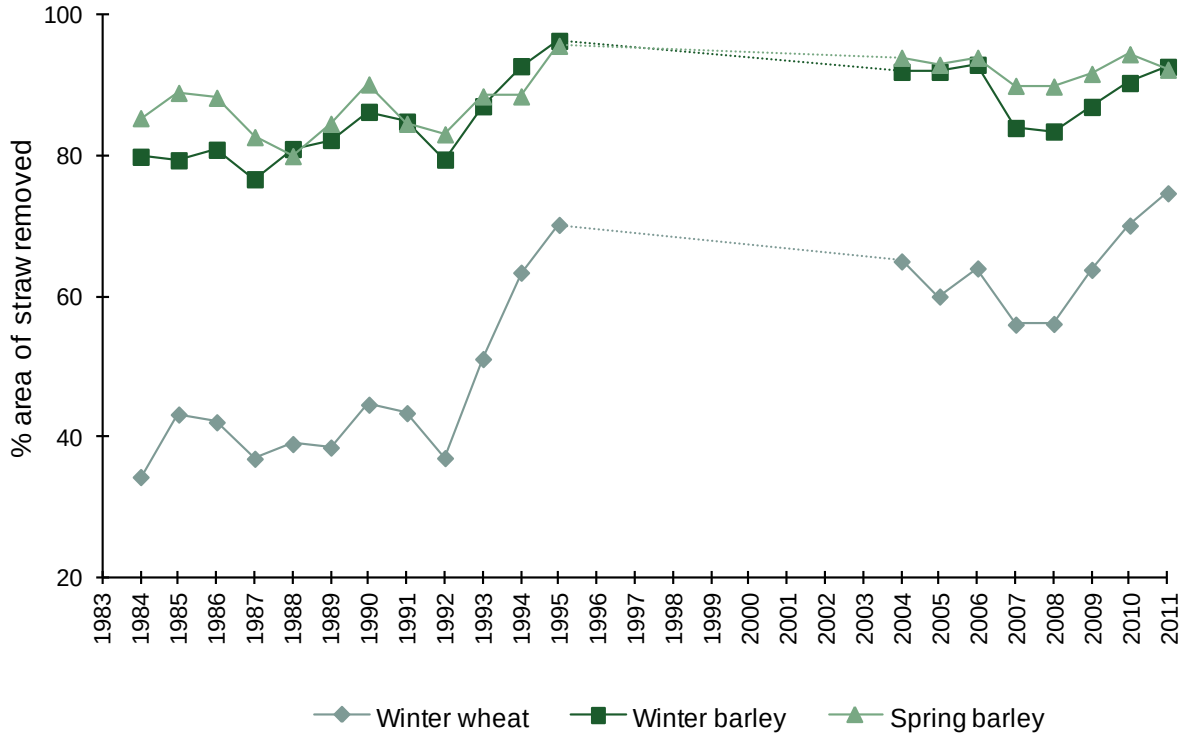
(c)


kg/ha
300
250
200
150
100
50
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Maincrop potatoes phosphate
Maincrop potatoes potash
Sugar beet phosphate
Sugar beet potash

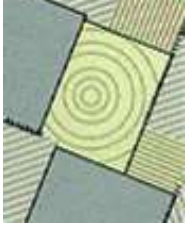


Estimates of the percentage of straw removed from wheat and barley fields are shown in Figure B2.6. Data collected as part of the 2012 survey will relate to the fate of the straw from the 2011 harvest so is reported against 2011.

Figure B2.6 Percentage of straw removed from wheat and barley fields, England and Wales harvest years 1985 – 1995, Great Britain harvest years 2004 - 2011



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.

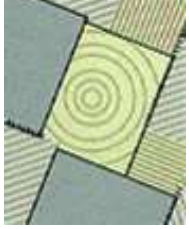


Quantities of nitrogen, phosphate and potash used in the UK since 1965 are shown in Table B2.5. These data are based on BSFP findings and trade and sales data. They are compiled by the Agricultural Industries Confederation in conjunction with Defra. They are considered to be the official figures for 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	800	127	74	1001	160	49	6	215	244	68	13	325
2009	767	124	57	948	91	34	4	129	148	52	8	208
2010	813	127	76	1016	134	44	6	184	182	57	12	251
2011	824	124	74	1022	145	42	5	192	213	59	11	283
2012e	*809*	*125*	*66*	*1000*	*140*	*43*	*5*	*188*	*193*	*56*	*10*	*259*

Note: Years are harvest (e.g. 2012 refers to the 2011/12 cropping year) rather than calendar years. Data for 2012 are estimates.



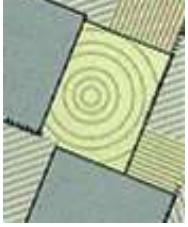
SECTION C – TABLES

CONTENTS

GREAT BRITAIN TABLES 2012

ENGLAND AND WALES TABLES 2012

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 2012

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 2012

	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	78	33	36	32	30	124	47	74	97	16	27	52
Winter wheat	99	41	40	52	19	187	61	77	184	25	31	1693
Spring barley	96	70	74	45	32	104	48	63	99	34	47	640
Winter barley	99	53	57	51	20	144	57	72	143	30	41	512
Oats	88	52	54	32	27	106	53	66	94	28	35	211
Rye/triticale/Durum wheat	38	25	19	13	46	131	57	66	50	14	12	27
Potatoes (seed or earlies)	87	73	81	9	35	136	128	162	119	93	132	18
Potatoes (maincrop)	95	76	78	31	43	142	134	247	135	103	192	110
Sugar beet	97	40	64	21	43	98	59	110	95	23	70	142
Spring oilseed rape	100	59	80	58	4	119	59	76	119	35	61	11
Winter oilseed rape	100	43	39	73	18	187	57	68	187	24	27	546
Linseed	96	26	50	43	5	90	52	70	86	14	35	38
Forage maize	75	54	31	9	92	51	46	51	38	25	16	192
Rootcrops for stockfeed	87	67	82	24	44	93	78	92	81	52	75	74
Leafy forage crops	64	45	49	17	49	84	32	49	54	14	24	43
Arable silage/other fodder crops	35	22	24	5	33	96	46	45	33	10	11	69
Peas - human consumption	0	29	27	0	0	-	79	82	-	23	22	46
Peas - animal consumption	3	24	36	7	7	-	50	70	-	12	25	37
Beans - animal consumption	0	26	28	4	7	-	57	70	-	15	20	132
Vegetables (brassicae)	99	69	84	19	33	160	112	133	159	78	112	11
Vegetables (other)	63	44	62	24	10	101	79	140	64	35	87	63
Soft Fruit	46	81	81	87	0	-	-	-	-	-	-	7
Top Fruit	83	18	58	15	0	73	-	69	61	-	40	27
Other tillage	25	16	13	10	8	86	62	96	21	10	12	52
All tillage	91	47	47	47	24	158	59	79	144	28	37	4753
Grass under 5 years old	83	53	57	17	47	115	30	42	95	16	24	1004
Grass 5 years and over	56	39	39	5	32	85	20	25	48	8	10	2440
All grass	61	41	42	7	34	91	22	29	55	9	12	3444
All crops and grass	74	44	44	25	30	128	40	53	95	17	23	8197

Source: British Survey of Fertiliser Practice 2012

Table GB1.2 Use of straight fertiliser, Great Britain 2012

	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	71	10	13	125	-	-	89	-	-	52
Winter wheat	96	12	11	184	68	89	177	8	10	1693
Spring barley	73	3	8	86	62	75	63	2	6	640
Winter barley	95	7	10	140	77	89	133	5	9	512
Oats	78	5	11	104	76	73	82	4	8	211
Rye/triticale/Durum wheat	38	7	0	131	-	-	50	-	-	27
Potatoes (seed or earlies)	45	0	29	71	-	161	32	-	47	18
Potatoes (maincrop)	53	4	27	81	58	155	43	2	42	110
Sugar beet	92	0	23	96	-	120	88	-	28	142
Spring oilseed rape	100	8	28	118	-	-	118	-	-	11
Winter oilseed rape	99	9	10	182	71	91	180	7	9	546
Linseed	95	17	41	89	49	73	85	8	30	38
Forage maize	34	0	6	71	-	117	24	-	7	192
Rootcrops for stockfeed	26	0	10	113	-	103	29	-	10	74
Leafy forage crops	27	0	3	91	-	-	25	-	-	43
Arable silage/other fodder crops	25	5	4	100	-	-	25	-	-	69
Peas - human consumption	0	10	8	-	91	111	-	9	9	46
Peas - animal consumption	3	3	15	-	-	82	-	-	12	37
Beans - animal consumption	0	8	13	-	56	71	-	4	9	132
Vegetables (brassicae)	54	0	0	59	-	-	32	-	-	11
Vegetables (other)	47	16	26	86	42	172	41	7	45	63
Soft Fruit	17	52	81	-	-	-	-	-	-	7
Top Fruit	51	0	31	75	-	45	38	-	14	27
Other tillage	19	2	1	99	-	-	19	-	-	52
All tillage	83	9	12	157	69	95	131	6	11	4753
Grass under 5 years old	44	1	2	109	66	76	48	1	1	1004
Grass 5 years and over	23	1	0	89	36	60	20	0	0	2440
All grass	26	1	1	94	42	68	25	0	0	3444
All crops and grass	52	4	6	140	66	93	72	3	5	8197

Source: British Survey of Fertiliser Practice 2012

Table GB1.3 Use of compound fertiliser, Great Britain 2012

	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	17	23	23	46	35	58	8	8	13	52
Winter wheat	10	30	29	72	57	71	7	17	20	1693
Spring barley	60	67	68	61	48	61	37	32	41	640
Winter barley	16	46	47	65	54	68	10	25	32	512
Oats	20	48	44	59	50	63	12	24	28	211
Rye/triticale/Durum wheat	0	19	19	-	57	66	-	11	12	27
Potatoes (seed or earlies)	81	73	59	106	128	144	86	93	85	18
Potatoes (maincrop)	72	73	72	128	138	208	92	100	150	110
Sugar beet	13	39	44	50	59	95	7	23	42	142
Spring oilseed rape	2	52	52	-	-	-	-	-	-	11
Winter oilseed rape	17	35	30	39	51	59	7	18	18	546
Linseed	1	9	9	-	56	59	-	5	6	38
Forage maize	51	54	25	28	46	35	14	25	9	192
Rootcrops for stockfeed	73	67	72	71	78	90	52	52	65	74
Leafy forage crops	43	45	45	68	32	43	29	14	19	43
Arable silage/other fodder crops	13	20	20	60	38	40	8	8	8	69
Peas - human consumption	0	19	19	-	72	70	-	14	13	46
Peas - animal consumption	0	21	21	-	49	60	-	10	13	37
Beans - animal consumption	0	18	16	-	58	69	-	10	11	132
Vegetables (brassicae)	84	69	84	151	112	133	127	78	112	11
Vegetables (other)	26	28	36	90	100	117	23	28	42	63
Soft Fruit	29	29	29	-	-	-	-	-	-	7
Top Fruit	42	18	42	53	-	62	22	-	26	27
Other tillage	7	13	12	39	56	95	3	7	12	52
All tillage	21	39	37	63	56	71	13	22	26	4753
Grass under 5 years old	52	52	56	90	29	41	47	15	23	1004
Grass 5 years and over	39	38	39	71	19	25	28	7	10	2440
All grass	41	40	42	75	21	28	31	9	12	3444
All crops and grass	32	40	40	71	36	46	23	14	18	8197

Source: British Survey of Fertiliser Practice 2012

Table GB1.4 Use of lime, Great Britain 2012

	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	-	-	-	-	-	-	-	-	-	-	-	-	4	52
Winter wheat	4.8	1.9	0.6	0.1	0.5	7.9	3.1	6.6	5.3	8.7	1.2	4.1	120	1693
Spring barley	8.8	0.3	1.7	-	5.0	15.9	3.8	3.7	3.6	-	1.2	2.9	108	640
Winter barley	4.8	1.4	3.1	0.5	0.5	10.3	4.1	6.4	4.5	5.0	1.8	4.5	52	512
Oats	2.0	1.7	1.3	-	1.3	6.2	1.8	9.1	4.5	-	0.5	4.1	14	211
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	18
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	110
Sugar beet	2.0	1.1	0.5	12.6	-	16.2	8.5	4.8	3.7	6.8	-	6.8	23	142
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	2	11
Winter oilseed rape	5.9	3.5	1.1	0.4	0.6	11.6	4.1	4.4	6.5	5.0	1.7	4.3	55	546
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	0	38
Forage maize	6.9	2.4	0.7	-	0.1	10.1	3.8	2.7	3.4	-	0.4	3.4	29	192
Rootcrops for stockfeed	5.5	1.7	4.3	-	8.2	19.8	4.5	5.0	4.6	-	0.9	3.1	14	74
Leafy forage crops	6.1	-	1.9	-	12.0	20.0	3.9	-	7.5	-	2.2	3.2	13	43
Arable silage/other fodder crops	4.2	6.1	2.1	-	-	12.3	4.9	4.8	5.0	-	-	4.9	11	69
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	46
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	37
Beans - animal consumption	1.3	2.2	0.3	-	0.4	4.2	3.2	10.0	4.0	-	3.0	6.8	5	132
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	3	11
Vegetables (other)	8.2	1.9	-	1.5	-	11.6	3.4	1.3	-	5.0	-	3.3	7	63
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	7
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	0	52
All tillage	5.2	1.8	1.1	0.5	1.3	9.8	3.7	5.7	4.8	6.5	1.2	4.0	467	4753
Grass under 5 years old	3.0	0.2	1.0	-	0.8	5.0	4.3	4.5	4.9	-	1.5	4.0	73	1004
Grass 5 years and over	1.1	0.0	0.4	-	0.8	2.3	3.9	3.2	4.7	-	1.4	3.2	92	2440
All grass	1.4	0.0	0.5	-	0.8	2.7	4.0	4.1	4.8	-	1.4	3.4	165	3444
All crops and grass	3.1	0.8	0.8	0.2	1.0	5.9	3.8	5.6	4.8	6.5	1.3	3.8	632	8197

Source: British Survey of Fertiliser Practice 2012

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2012

	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	36	36	22	75	18	20	37	7	7	1620
Grazed mown	77	49	52	56	105	24	37	81	12	19	1308
All grazings	58	40	41	32	87	20	27	51	8	11	2928
Cut for silage - grazed	83	54	59	65	112	25	39	93	13	23	983
Cut for silage - not grazed	91	59	64	70	129	32	46	118	19	30	378
All cut for silage	85	55	60	67	117	27	41	99	15	25	1361
Cut for hay - grazed	62	35	34	29	74	19	25	46	7	8	364
Cut for hay - not grazed	56	38	36	22	90	27	32	50	10	12	103
All cut for hay	61	35	35	28	76	21	26	47	7	9	467
All mowings	79	50	54	57	110	26	39	86	13	21	1774
All grass	61	41	42	34	91	22	29	55	9	12	3444

Source: British Survey of Fertiliser Practice 2012

Table GB3.0 Product use by month of application, Great Britain 2012

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	9	36	32	16	3	2	1
Straight P	18	21	3	1	5	11	24	5	5	1	0	8
Straight K	4	8	9	2	5	19	36	10	3	1	0	2
Compounds	7	4	1	0	1	4	24	29	15	6	3	5
All fertilisers	3	2	1	0	1	8	31	30	15	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	7	33	34	17	5	3	1
Phosphate	12	9	2	0	2	7	26	21	11	2	1	6
Potash	9	7	3	1	2	9	29	21	10	4	2	4
Total	3	3	1	0	1	7	31	30	15	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 2012.

'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, Table B2.5.

Source: British Survey of Fertiliser Practice 2012

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2012

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	33.8	50.6	9.5	26.4	50.5	21.2	43.1	29.3	32.1	25.7	32.4	28.4	39.6
Urea	3.0	10.7	0.6	4.5	12.2	3.5	8.6	3.2	4.3	3.7	0.8	3.3	7.3
Calcium Ammonium Nitrate (CAN)	2.1	0.9	0.3	0.6	0.4	2.5	1.0	1.7	1.6	1.7	0.8	1.8	1.2
Urea Ammonium Nitrate (UAN)	5.5	9.7	1.7	4.5	10.4	2.6	8.1	1.9	2.8	2.9	8.6	2.4	6.7
Other Straight N	1.9	2.4	2.2	0.0	5.5	2.5	2.7	1.1	0.4	0.9	1.6	0.9	2.3
Triple Superphosphate (TSP)	1.5	2.9	1.2	0.1	2.1	3.4	2.4	0.5	0.3	0.3	3.4	0.6	2.0
Other Straight P	0.0	0.1	0.1	0.0	0.0	0.3	0.1	0.3	0.8	0.1	0.0	0.2	0.1
Muriate of Potash (MOP)	2.2	3.0	8.8	1.9	2.6	7.5	3.4	0.3	0.2	0.5	5.3	0.4	2.7
Other Straight K	0.1	0.2	0.5	19.2	0.4	1.8	1.1	0.1	0.0	0.2	0.0	0.2	0.9
PK	8.6	11.5	2.9	27.8	7.9	12.9	10.8	2.5	2.5	3.0	1.6	2.7	8.9
NK	2.1	0.5	2.0	1.3	0.2	4.5	1.1	4.6	2.7	7.5	0.6	5.2	2.1
Low N (<19% N)	19.5	3.4	67.5	7.7	5.3	25.1	10.9	2.6	1.9	2.4	10.9	2.8	8.9
High N (>=19% N)	19.6	4.0	1.5	0.4	1.6	10.7	6.1	51.7	50.1	50.9	33.9	50.9	16.9
Other	0.1	0.3	1.3	5.6	0.9	1.5	0.7	0.2	0.3	0.3	0.0	0.2	0.6
Total product ('000 tonnes)	**343**	**1545**	**89**	**91**	**485**	**122**	**2674**	**959**	**94**	**591**	**17**	**1160**	**3834**

Source: British Survey of Fertiliser Practice 2012

Table GB3.2 Use of product type by crop group, Great Britain 2012

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	10.0	65.8	0.5	1.9	19.6	2.2	78.6	84.2	10.5	47.1	1.8	21.4	1460
Urea	4.1	68.3	0.8	1.1	24.4	1.3	89.7	81.9	7.3	60.7	0.4	10.3	327
Calcium Ammonium Nitrate (CAN)	33.9	42.8	0.7	3.7	8.2	10.7	58.4	84.9	6.2	43.8	0.4	41.6	53
Urea Ammonium Nitrate (UAN)	7.7	67.5	0.6	1.7	21.2	1.2	91.6	53.2	9.4	72.5	5.8	8.4	311
Other Straight N	6.2	43.7	5.6	0.0	40.6	3.9	94.3	99.7	2.0	40.2	2.5	5.7	76
Triple Superphosphate (TSP)	7.2	66.4	0.6	0.1	16.5	9.2	93.7	71.4	11.7	13.6	8.1	6.3	65
Other Straight P	0.0	77.8	8.0	0.0	0.0	14.2	47.1	100.0	18.1	15.2	0.0	52.9	7
Muriate of Potash (MOP)	10.3	49.3	7.6	1.9	12.5	18.5	95.7	71.4	2.6	58.5	16.4	4.3	75
Other Straight K	2.7	15.4	3.8	64.2	7.4	6.5	95.0	72.4	0.0	85.8	0.0	5.0	25
PK	9.4	60.5	0.4	10.8	13.3	5.6	93.4	79.7	6.6	57.7	0.5	6.6	312
NK	27.3	42.1	5.0	4.0	5.4	16.2	28.8	71.2	5.6	85.8	0.1	71.2	100
Low N (<19% N)	32.7	17.0	27.3	2.5	9.5	10.9	91.1	71.0	5.7	51.2	8.8	8.9	258
High N (>=19% N)	49.3	34.8	0.2	0.3	6.8	8.6	14.8	84.9	7.4	47.8	0.9	85.2	742
Other	2.3	21.7	4.5	16.9	23.2	31.4	89.7	63.5	12.2	77.6	0.0	10.3	23
All Fertilisers	**12.8**	**57.8**	**3.3**	**3.4**	**18.1**	**4.5**	**69.7**	**82.7**	**8.1**	**50.9**	**1.4**	**30.3**	**3834**

Source: British Survey of Fertiliser Practice 2012

Table GB3.3 Product use by month of application, Great Britain 2012

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	7.3	34.6	33.0	18.2	3.4	2.1	0.7	0.4	0.2	0.0	0.0	1460
Urea	0.0	13.6	39.6	28.6	10.6	4.0	3.2	0.1	0.2	0.0	0.1	0.0	327
Calcium Ammonium Nitrate (CAN)	0.0	3.7	25.2	38.4	19.6	6.7	3.3	2.7	0.4	0.0	0.0	0.0	53
Urea Ammonium Nitrate (UAN)	0.0	8.5	37.0	34.1	17.5	1.6	0.4	0.2	0.6	0.1	0.0	0.0	311
Other Straight N	0.0	28.1	51.9	12.4	3.7	1.2	1.7	0.0	0.5	0.1	0.3	0.0	76
Triple Superphosphate (TSP)	4.9	11.1	26.3	4.9	4.1	0.1	0.0	5.2	19.7	19.5	3.5	0.6	65
Other Straight P	0.0	6.2	0.0	3.8	13.6	6.8	0.0	31.3	11.6	26.7	0.0	0.0	7
Muriate of Potash (MOP)	3.5	18.2	39.6	11.9	4.6	0.9	0.0	2.2	5.3	5.9	5.4	2.4	75
Other Straight K	8.9	22.6	26.8	3.8	0.1	1.8	0.8	2.6	1.7	12.6	18.2	0.0	25
PK	4.8	10.9	16.4	8.1	1.8	0.0	0.0	9.1	27.0	16.9	4.5	0.6	312
NK	0.0	1.1	18.8	19.6	17.1	25.5	11.4	5.1	0.5	0.7	0.1	0.0	100
Low N (<19% N)	0.0	5.6	43.1	26.7	11.3	1.6	0.5	4.1	4.4	2.0	0.8	0.0	258
High N (>=19% N)	0.0	1.8	20.9	40.6	21.2	7.5	4.4	2.8	0.6	0.1	0.1	0.0	742
Other	2.6	36.8	17.6	2.1	1.4	0.0	0.0	4.8	1.4	0.7	19.2	13.5	23
All Fertilisers	**0.6**	**7.8**	**31.2**	**29.7**	**15.2**	**4.1**	**2.4**	**2.3**	**3.3**	**2.2**	**0.9**	**0.2**	**3834**

Source: British Survey of Fertiliser Practice 2012

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2012

	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	48	48	7	115	72	100	115	34	48	14
Winter wheat	99	44	38	15	198	62	75	196	27	29	769
Spring barley	97	69	70	23	110	56	68	107	39	48	170
Winter barley	99	60	54	14	157	65	77	156	39	42	158
Oats	87	47	45	24	108	53	65	95	25	29	78
Rye/triticale/Durum wheat	18	0	0	42	-	-	-	-	-	-	6
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	3
Potatoes (maincrop)	94	92	92	40	132	137	229	125	126	210	14
Sugar beet	100	39	54	43	104	79	95	104	31	51	30
Spring oilseed rape	100	82	82	0	117	59	81	117	48	66	6
Winter oilseed rape	100	45	37	14	190	58	66	189	26	25	317
Linseed	100	21	53	4	96	40	70	96	8	37	25
Forage maize	66	46	0	100	37	-	-	25	-	-	11
Rootcrops for stockfeed	78	71	58	22	130	85	137	102	61	80	9
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	1
Arable silage/other fodder crops	16	23	23	11	-	-	-	-	-	-	7
Peas - human consumption	0	27	18	0	-	83	-	-	22	-	16
Peas - animal consumption	4	26	42	4	-	48	69	-	13	29	23
Beans - animal consumption	1	31	33	1	-	54	64	-	17	21	76
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	7	7	0	8	-	-	-	-	-	-	7
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	38	27	18	15	101	65	-	38	18	-	21
All tillage	93	47	42	16	176	61	74	163	28	31	1761
Grass under 5 years old	69	45	47	5	104	35	45	72	16	21	135
Grass 5 years and over	49	24	25	4	75	27	32	37	7	8	272
All grass	54	30	31	4	84	30	37	45	9	11	407
All crops and grass	87	44	41	14	168	58	70	146	26	28	2168

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

Source: British Survey of Fertiliser Practice 2012

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2012

	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	76	19	19	12	156	-	-	119	-	-	16
Winter wheat	98	35	38	10	178	64	85	174	22	33	431
Spring barley	95	63	72	16	109	48	68	104	30	49	165
Winter barley	100	52	63	1	135	55	74	135	28	47	117
Oats	96	57	80	15	116	67	81	111	38	65	25
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Potatoes (seed or earlies)	84	77	77	27	137	120	164	115	92	126	14
Potatoes (maincrop)	95	76	78	38	145	136	256	137	103	199	82
Sugar beet	98	40	64	38	95	56	115	94	22	74	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Winter oilseed rape	100	37	41	21	185	51	69	185	19	28	126
Linseed	100	41	48	6	67	-	-	67	-	-	9
Forage maize	92	69	22	100	34	29	29	31	20	6	19
Rootcrops for stockfeed	82	29	86	39	106	104	97	87	30	83	14
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	37	0	21	0	-	-	-	-	-	-	7
Peas - human consumption	0	33	34	0	-	77	83	-	25	28	26
Peas - animal consumption	0	18	24	17	-	-	-	-	-	-	8
Beans - animal consumption	0	21	26	5	-	-	99	-	-	26	22
Vegetables (brassicae)	100	63	76	0	189	-	-	189	-	-	5
Vegetables (other)	70	47	68	10	102	80	140	71	37	95	52
Soft Fruit	43	86	86	0	-	-	-	-	-	-	6
Top Fruit	84	19	58	0	73	-	69	61	-	40	24
Other tillage	21	11	12	1	67	52	95	14	5	11	19
All tillage	91	44	51	15	147	64	98	133	28	50	1293
Grass under 5 years old	71	33	34	34	109	30	41	77	10	14	99
Grass 5 years and over	49	26	26	15	98	22	31	48	6	8	172
All grass	53	28	27	19	101	24	34	54	7	9	271
All crops and grass	83	40	46	16	140	58	90	116	23	41	1564

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 2012

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2012

	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	54	22	25	81	110	-	-	59	-	-	11
Winter wheat	90	28	31	38	154	61	64	139	17	20	89
Spring barley	95	74	76	79	77	31	37	72	23	28	49
Winter barley	97	41	45	41	117	53	61	114	21	27	35
Oats	100	20	20	39	109	-	-	109	-	-	6
Rye/triticale/Durum wheat	27	0	0	45	-	-	-	-	-	-	5
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	17	36	67	178	46	64	178	8	23	11
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	77	59	38	90	54	54	52	41	32	20	94
Rootcrops for stockfeed	64	52	72	92	-	-	-	-	-	-	6
Leafy forage crops	37	0	28	74	-	-	-	-	-	-	5
Arable silage/other fodder crops	63	33	33	59	92	38	38	58	13	13	28
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	0	0	15	57	-	-	-	-	-	-	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	0
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	82	46	41	66	100	48	51	82	22	21	348
Grass under 5 years old	86	41	52	78	156	32	58	134	13	30	223
Grass 5 years and over	82	44	50	66	129	23	34	105	10	17	418
All grass	83	44	50	69	136	25	40	112	11	20	641
All crops and grass	83	44	49	68	130	29	41	107	13	20	989

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

Source: British Survey of Fertiliser Practice 2012

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2012

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	-	-	-	-	-	-	-	-	-	-	3
Winter wheat	94	39	35	57	135	53	67	127	21	24	86
Spring barley	96	81	83	63	87	41	51	84	34	42	122
Winter barley	91	57	64	60	129	40	53	118	23	34	55
Oats	87	75	75	61	87	39	47	76	29	35	47
Rye/triticale/Durum wheat	50	50	34	51	141	59	60	71	29	20	13
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	27	49	7	151	-	-	151	-	-	9
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	59	51	34	92	41	47	53	24	24	18	32
Rootcrops for stockfeed	98	84	93	51	70	70	68	68	59	63	28
Leafy forage crops	77	59	59	41	81	33	39	62	19	23	31
Arable silage/other fodder crops	22	27	22	63	72	37	27	16	10	6	20
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	0	15	15	5	-	-	-	-	-	-	6
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	1
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	83	58	57	60	103	45	54	86	26	31	459
Grass under 5 years old	88	68	68	48	87	27	33	76	18	23	383
Grass 5 years and over	51	41	41	31	67	18	21	34	7	9	1280
All grass	55	44	44	32	70	19	23	38	9	10	1663
All crops and grass	57	45	45	34	73	22	26	41	10	11	2122

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 2012

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2012

	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	63	45	63	41	-	-	-	-	-	-	8
Winter wheat	99	51	54	38	181	57	78	180	29	42	285
Spring barley	96	79	84	45	98	44	61	94	34	52	128
Winter barley	100	51	55	33	145	49	70	145	25	39	135
Oats	85	58	58	18	110	58	76	93	33	44	54
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	1
Potatoes (maincrop)	98	53	53	94	136	118	204	133	63	109	11
Sugar beet	74	24	69	92	101	-	80	75	-	55	7
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	44	45	29	179	58	80	179	26	36	72
Linseed	-	-	-	-	-	-	-	-	-	-	3
Forage maize	76	31	30	87	74	41	65	56	13	20	36
Rootcrops for stockfeed	90	75	88	41	101	89	110	91	67	96	16
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	18	17	15	5	83	-	-	15	-	-	7
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	4
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	0	8	11	24	-	-	96	-	-	10	22
Vegetables (brassicae)	99	78	95	79	118	-	-	117	-	-	6
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	3
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	0	0	0	12	-	-	-	-	-	-	9
All tillage	92	52	56	38	152	54	74	141	28	42	818
Grass under 5 years old	81	54	56	25	116	32	43	94	17	24	164
Grass 5 years and over	55	30	31	12	86	22	28	47	7	9	289
All grass	61	36	37	15	96	26	34	59	9	12	453
All crops and grass	77	45	47	27	131	43	59	102	19	28	1271

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

Source: British Survey of Fertiliser Practice 2012

Table EW1.1 Total fertiliser use, England & Wales 2012

	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	82	34	38	32	122	43	69	100	15	26	40
Winter wheat	99	40	37	19	187	61	77	184	24	29	1591
Spring barley	93	47	54	30	103	40	54	96	19	29	389
Winter barley	99	51	54	20	144	56	71	142	29	38	466
Oats	91	49	49	23	106	53	65	97	26	32	160
Rye/triticale/Durum wheat	36	26	19	48	126	57	66	46	15	13	26
Potatoes (seed or earlies)	92	68	83	51	150	130	171	139	89	142	10
Potatoes (maincrop)	95	73	75	47	143	138	251	136	101	187	102
Sugar beet	97	40	64	43	98	59	110	95	23	70	142
Spring oilseed rape	100	59	80	4	119	59	76	119	35	61	11
Winter oilseed rape	100	41	37	18	187	58	69	187	23	26	512
Linseed	96	26	50	5	90	52	70	86	14	35	38
Forage maize	75	54	30	92	51	48	55	39	26	16	187
Rootcrops for stockfeed	82	55	76	48	101	57	84	83	31	64	54
Leafy forage crops	59	37	42	53	75	31	53	45	12	22	28
Arable silage/other fodder crops	28	17	19	34	92	48	44	26	8	8	58
Vining peas (for human consumption)	0	31	29	0	-	78	81	-	24	23	40
Field peas (harvested dry)	3	24	36	7	-	50	70	-	12	25	36
Field beans (harvested dry)	0	26	28	7	-	57	69	-	15	20	127
Vegetables (brassicae)	99	62	80	41	110	-	112	110	-	90	10
Vegetable Other	60	39	60	9	106	59	147	64	23	88	56
Soft Fruit	46	81	81	0	-	-	-	-	-	-	7
Top Fruit	83	18	58	0	73	-	69	61	-	40	27
Other tillage	25	16	13	8	86	62	96	22	10	13	51
All tillage	91	42	42	23	162	59	80	147	25	34	4168
Grass less than five years old	81	43	48	52	116	28	43	94	12	21	724
Grass five years and over	55	36	37	35	86	20	26	48	7	9	2034
All grass	59	37	38	37	92	21	29	54	8	11	2758
All crops and grass	74	39	40	31	133	40	54	98	16	22	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.2 Use of straight fertiliser, England & Wales 2012

	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	73	13	17	126	-	-	92	-	-	40
Winter wheat	97	13	11	185	68	89	179	9	10	1591
Spring barley	79	5	10	97	62	78	76	3	8	389
Winter barley	95	7	9	140	76	89	133	5	8	466
Oats	85	6	11	104	76	74	89	4	8	160
Rye/triticale/Durum wheat	36	7	0	126	-	-	46	-	-	26
Potatoes (seed or earlies)	50	0	10	64	-	-	32	-	-	10
Potatoes (maincrop)	54	5	26	81	58	147	44	3	39	102
Sugar beet	92	0	23	96	-	120	88	-	28	142
Spring oilseed rape	100	8	28	118	-	-	118	-	-	11
Winter oilseed rape	99	9	9	183	72	94	181	7	9	512
Linseed	95	17	41	89	49	73	85	8	30	38
Forage maize	35	0	6	71	-	117	25	-	7	187
Rootcrops for stockfeed	36	0	14	113	-	103	40	-	14	54
Leafy forage crops	26	0	5	-	-	-	-	-	-	28
Arable silage/other fodder crops	20	5	4	102	-	-	20	-	-	58
Peas - human consumption	0	10	8	-	89	110	-	9	8	40
Peas - animal consumption	3	3	15	-	-	82	-	-	13	36
Beans - animal consumption	0	8	13	-	56	71	-	4	9	127
Vegetables (brassicae)	43	0	0	-	-	-	-	-	-	10
Vegetables (other)	52	18	29	86	42	174	45	8	50	56
Soft Fruit	17	52	81	-	-	-	-	-	-	7
Top Fruit	51	0	31	75	-	45	38	-	14	27
Other tillage	19	2	1	99	-	-	19	-	-	51
All tillage	85	9	12	162	69	96	138	7	11	4168
Grass under 5 years old	51	1	2	112	53	74	57	1	2	724
Grass 5 years and over	24	1	0	90	34	60	22	0	0	2034
All grass	28	1	1	96	38	67	27	0	1	2758
All crops and grass	55	5	6	144	66	94	79	3	6	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.3 Use of compound fertiliser, England & Wales 2012

	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	16	21	21	46	24	44	7	5	9	40
Winter wheat	8	28	27	65	56	69	5	16	18	1591
Spring barley	30	42	44	65	38	48	20	16	21	389
Winter barley	14	44	45	68	53	67	9	23	30	466
Oats	16	43	38	50	49	61	8	21	23	160
Rye/triticale/Durum wheat	0	19	19	-	57	66	-	11	13	26
Potatoes (seed or earlies)	83	68	73	129	130	161	107	89	117	10
Potatoes (maincrop)	69	69	68	134	143	217	93	98	148	102
Sugar beet	13	39	44	50	59	95	7	23	42	142
Spring oilseed rape	2	52	52	-	-	-	-	-	-	11
Winter oilseed rape	15	32	28	38	52	59	6	17	17	512
Linseed	1	9	9	-	56	59	-	5	6	38
Forage maize	51	54	23	27	48	39	14	26	9	187
Rootcrops for stockfeed	64	55	62	68	57	80	43	31	50	54
Leafy forage crops	33	37	37	65	31	43	22	12	16	28
Arable silage/other fodder crops	10	15	15	58	36	37	6	5	6	58
Peas - human consumption	0	21	21	-	72	70	-	15	15	40
Peas - animal consumption	0	21	21	-	49	60	-	10	13	36
Beans - animal consumption	0	18	16	-	57	68	-	10	11	127
Vegetables (brassicae)	80	62	80	95	-	112	76	-	90	10
Vegetables (other)	19	21	31	102	74	121	19	16	38	56
Soft Fruit	29	29	29	-	-	-	-	-	-	7
Top Fruit	42	18	42	53	-	62	22	-	26	27
Other tillage	7	14	13	39	56	95	3	8	12	51
All tillage	15	33	31	61	56	71	9	18	22	4168
Grass under 5 years old	43	42	47	86	28	40	37	12	19	724
Grass 5 years and over	37	35	36	71	19	25	26	7	9	2034
All grass	37	36	38	73	21	28	27	7	11	2758
All crops and grass	27	35	35	70	36	46	19	13	16	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.4 Use of lime, England & Wales 2012

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	40
Winter wheat	4.5	2.0	0.4	0.1	0.3	7.3	3.3	6.6	5.5	8.7	1.7	4.3	106	1591
Spring barley	6.7	0.4	1.1	-	1.1	9.3	4.4	3.5	4.8	-	0.4	3.9	39	389
Winter barley	4.6	1.5	3.3	0.6	0.5	10.6	4.1	6.4	4.5	5.0	1.8	4.5	50	466
Oats	0.7	2.1	0.6	-	0.7	4.2	2.5	9.1	3.8	-	0.6	5.8	6	160
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	26
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	10
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	102
Sugar beet	2.0	1.1	0.5	12.6	-	16.2	8.5	4.8	3.7	6.8	-	6.8	23	142
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	2	11
Winter oilseed rape	5.7	3.7	1.1	0.4	0.5	11.4	4.1	4.4	6.5	5.0	2.2	4.4	51	512
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	0	38
Forage maize	7.2	2.5	0.7	-	0.1	10.5	3.8	2.7	3.4	-	0.4	3.4	29	187
Rootcrops for stockfeed	5.1	2.3	5.1	-	8.5	20.9	4.3	5.0	4.5	-	1.0	3.1	10	54
Leafy forage crops	8.8	-	2.7	-	8.0	19.6	3.9	-	7.5	-	4.2	4.5	9	28
Arable silage/other fodder crops	3.6	6.7	-	-	-	10.3	5.0	4.8	-	-	-	4.9	6	58
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	40
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	36
Beans - animal consumption	1.3	2.2	0.3	-	0.4	4.2	3.2	10.0	4.0	-	3.0	6.8	5	127
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	3	10
Vegetables (other)	9.3	2.2	-	1.7	-	13.2	3.4	1.3	-	5.0	-	3.3	7	56
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	7
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	0	51
All tillage	4.6	2.0	0.8	0.6	0.6	8.6	3.8	5.7	5.1	6.5	1.4	4.4	354	4168
Grass under 5 years old	3.5	0.3	0.5	-	0.5	4.8	4.2	4.5	4.7	-	2.6	4.1	42	724
Grass 5 years and over	1.0	0.0	0.2	-	0.9	2.2	3.8	3.2	4.6	-	1.4	2.9	69	2034
All grass	1.4	0.0	0.3	-	0.8	2.5	4.0	4.1	4.6	-	1.5	3.2	111	2758
All crops and grass	2.9	1.0	0.5	0.3	0.7	5.4	3.9	5.7	5.0	6.5	1.5	4.1	465	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2012

	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	18	3	4	7	20	5	17	15	6	5	-	-	-	-	-	-	-	-	40
Winter wheat	1	0	1	3	3	5	8	15	21	23	11	5	3	-	-	-	-	-	1591
Spring barley	7	1	5	14	19	29	20	5	1	-	-	-	-	-	-	-	-	-	389
Winter barley	1	0	1	5	7	16	23	24	16	4	2	-	-	-	-	-	-	-	466
Oats	9	1	4	10	23	26	21	5	0	1	-	-	-	-	-	-	-	-	160
Rye/triticale/Durum wheat	64	0	0	1	4	9	22	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	8	0	9	0	0	5	10	38	25	4	-	-	-	-	-	-	-	-	10
Potatoes (maincrop)	5	3	1	11	10	11	18	4	15	15	7	-	-	-	-	-	-	-	102
Sugar beet	3	2	9	7	32	28	17	3	-	-	-	-	-	-	-	-	-	-	142
Spring oilseed rape	0	0	0	0	23	36	41	-	-	-	-	-	-	-	-	-	-	-	11
Winter oilseed rape	0	0	1	3	3	4	7	13	26	23	13	5	1	-	-	-	-	-	512
Linseed	4	0	9	14	43	29	-	-	-	-	-	-	-	-	-	-	-	-	38
Forage maize	25	26	11	17	13	6	2	-	-	-	-	-	-	-	-	-	-	-	187
Rootcrops for stockfeed	18	3	11	12	3	28	18	2	0	0	6	-	-	-	-	-	-	-	54
Leafy forage crops	41	3	14	13	6	15	9	-	-	-	-	-	-	-	-	-	-	-	28
Arable silage/other fodder crops	72	0	6	5	3	7	5	2	-	-	-	-	-	-	-	-	-	-	58
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	97	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
Beans - animal consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	1	0	17	6	0	51	21	0	0	3	-	-	-	-	-	-	-	-	10
Vegetables (other)	40	0	12	3	11	16	4	5	6	3	-	-	-	-	-	-	-	-	56
Soft Fruit	54	0	35	0	6	0	6	-	-	-	-	-	-	-	-	-	-	-	7
Top Fruit	17	29	2	27	3	8	0	0	4	10	-	-	-	-	-	-	-	-	27
Other tillage	75	1	6	2	4	11	0	1	-	-	-	-	-	-	-	-	-	-	51
All tillage	9	1	2	5	7	10	10	12	16	15	7	3	2	-	-	-	-	-	4168
Grass under 5 years old	19	1	11	15	13	10	10	7	4	4	2	1	1	1	-	-	-	-	724
Grass 5 years and over	45	1	15	13	8	7	4	3	2	1	-	-	-	-	-	-	-	-	2034
All grass	41	1	14	13	8	7	5	4	2	1	1	1	-	-	-	-	-	-	2758
All crops and grass	26	1	9	9	8	8	8	8	8	8	4	2	1	-	-	-	-	-	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2012

	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	66	11	8	13	1	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Winter wheat	60	4	7	19	8	1	1	-	-	-	-	-	-	-	-	-	-	-	1591
Spring barley	53	10	23	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	389
Winter barley	49	5	15	22	6	1	1	1	-	-	-	-	-	-	-	-	-	-	466
Oats	51	9	10	21	6	1	1	-	-	-	-	-	-	-	-	-	-	-	160
Rye/triticale/Durum wheat	74	0	4	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	32	0	0	10	12	10	0	24	13	-	-	-	-	-	-	-	-	-	10
Potatoes (maincrop)	27	3	7	6	10	6	8	5	5	16	7	-	-	-	-	-	-	-	102
Sugar beet	60	5	11	13	5	4	2	-	-	-	-	-	-	-	-	-	-	-	142
Spring oilseed rape	41	0	20	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Winter oilseed rape	59	6	9	16	8	2	1	-	-	-	-	-	-	-	-	-	-	-	512
Linseed	74	1	7	12	6	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Forage maize	46	16	11	18	8	1	-	-	-	-	-	-	-	-	-	-	-	-	187
Rootcrops for stockfeed	45	7	8	30	5	4	1	-	-	-	-	-	-	-	-	-	-	-	54
Leafy forage crops	63	18	11	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Arable silage/other fodder crops	83	6	6	4	0	0	0	1	-	-	-	-	-	-	-	-	-	-	58
Peas - human consumption	69	3	6	2	12	4	0	3	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	76	4	6	12	2	-	-	-	-	-	-	-	-	-	-	-	-	-	36
Beans - animal consumption	74	1	7	16	0	2	-	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	38	0	0	0	21	41	-	-	-	-	-	-	-	-	-	-	-	-	10
Vegetables (other)	61	8	2	23	5	1	-	-	-	-	-	-	-	-	-	-	-	-	56
Soft Fruit	19	0	29	0	52	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Top Fruit	82	14	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Other tillage	84	2	5	2	1	4	0	1	-	-	-	-	-	-	-	-	-	-	51
All tillage	58	5	9	17	7	2	1	-	-	-	-	-	-	-	-	-	-	-	4168
Grass under 5 years old	57	22	15	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	724
Grass 5 years and over	64	25	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2034
All grass	63	25	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2758
All crops and grass	61	16	10	9	3	1	-	-	-	-	-	-	-	-	-	-	-	-	6926

Source: British Survey of Fertiliser Practice 2012

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2012

	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	62	3	13	2	15	3	2	-	-	-	-	-	-	-	-	-	-	-	40
Winter wheat	63	3	5	12	8	5	3	1	-	-	-	-	-	-	-	-	-	-	1591
Spring barley	46	5	18	20	7	3	1	-	-	-	-	-	-	-	-	-	-	-	389
Winter barley	46	3	11	15	15	7	2	1	-	-	-	-	-	-	-	-	-	-	466
Oats	51	6	12	11	14	4	2	0	0	1	-	-	-	-	-	-	-	-	160
Rye/triticale/Durum wheat	81	0	0	15	4	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	17	0	0	4	0	5	12	38	0	0	10	13	-	-	-	-	-	-	10
Potatoes (maincrop)	25	0	2	3	3	4	1	4	2	6	5	3	13	10	6	3	8	1	102
Sugar beet	36	3	4	6	15	10	14	5	3	1	0	1	0	1	-	-	-	-	142
Spring oilseed rape	20	2	17	20	8	33	-	-	-	-	-	-	-	-	-	-	-	-	11
Winter oilseed rape	63	4	8	11	8	4	2	1	-	-	-	-	-	-	-	-	-	-	512
Linseed	50	1	10	19	9	11	-	-	-	-	-	-	-	-	-	-	-	-	38
Forage maize	70	8	8	6	3	2	0	2	-	-	-	-	-	-	-	-	-	-	187
Rootcrops for stockfeed	24	2	9	16	19	21	3	5	1	-	-	-	-	-	-	-	-	-	54
Leafy forage crops	58	9	15	8	6	0	5	-	-	-	-	-	-	-	-	-	-	-	28
Arable silage/other fodder crops	81	6	6	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	58
Peas - human consumption	71	0	7	1	14	3	3	-	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	64	4	3	8	21	1	-	-	-	-	-	-	-	-	-	-	-	-	36
Beans - animal consumption	72	1	3	13	8	3	1	-	-	-	-	-	-	-	-	-	-	-	127
Vegetables (brassicae)	20	0	0	18	0	41	21	-	-	-	-	-	-	-	-	-	-	-	10
Vegetables (other)	40	0	5	8	4	9	3	8	2	8	8	4	-	-	-	-	-	-	56
Soft Fruit	19	0	0	0	0	0	0	29	52	-	-	-	-	-	-	-	-	-	7
Top Fruit	42	12	15	2	16	4	0	10	-	-	-	-	-	-	-	-	-	-	27
Other tillage	87	2	1	4	1	5	0	0	0	0	0	0	0	1	-	-	-	-	51
All tillage	58	3	7	12	9	5	2	1	-	-	-	-	-	-	-	-	-	-	4168
Grass under 5 years old	52	16	15	9	4	2	1	-	-	-	-	-	-	-	-	-	-	-	724
Grass 5 years and over	63	22	10	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2034
All grass	62	21	11	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2758
All crops and grass	60	13	9	7	5	3	1	1	-	-	-	-	-	-	-	-	-	-	6926

Source: British Survey of Fertiliser Practice 2012

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2012

	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	48	33	32	24	77	18	20	36	6	6	1254
Grazed mown	76	46	50	59	103	23	36	78	10	18	1177
All grazings	57	37	38	36	89	20	27	51	7	10	2431
Cut for silage - grazed	82	50	56	69	110	24	39	91	12	21	871
Cut for silage - not grazed	90	45	52	75	132	31	47	119	14	24	218
All cut for silage	84	49	55	70	115	25	40	96	12	22	1089
Cut for hay - grazed	62	33	32	30	74	19	24	46	6	8	344
Cut for hay - not grazed	52	30	30	21	93	24	35	49	7	10	76
All cut for hay	60	32	32	29	77	19	26	46	6	8	420
All mowings	77	45	49	59	108	24	38	83	11	18	1458
All grass	59	37	38	37	92	21	29	54	8	11	2758

Source: British Survey of Fertiliser Practice 2012

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2012

	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	1	17	12	5	5	2	2	1	1	-	-	-	-	-	-	-	-	1254
Grazed mown	24	1	12	16	14	9	9	6	4	2	1	1	1	1	-	-	-	-	1177
All grazings	43	1	15	13	8	7	5	4	2	1	-	-	-	-	-	-	-	-	2431
Cut for silage - grazed	18	1	9	15	15	11	11	8	5	2	1	1	1	1	-	-	-	-	871
Cut for silage - not grazed	10	1	2	16	12	14	14	10	5	6	6	3	1	1	-	-	-	-	218
All cut for silage	16	1	8	15	14	11	12	9	5	3	2	1	1	1	-	-	-	-	1089
Cut for hay - grazed	38	2	19	17	14	4	2	1	2	1	-	-	-	-	-	-	-	-	344
Cut for hay - not grazed	48	1	5	12	7	14	13	0	0	0	1	-	-	-	-	-	-	-	76
All cut for hay	40	1	17	16	12	6	4	1	1	1	-	-	-	-	-	-	-	-	420
All mowings	23	1	10	16	13	10	10	7	4	3	1	1	1	1	-	-	-	-	1458
All grass	41	1	14	13	8	7	5	4	2	1	1	1	-	-	-	-	-	-	2758

Source: British Survey of Fertiliser Practice 2012

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2012

	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	67	25	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1254
Grazed mown	54	27	15	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1177
All grazings	63	26	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2431
Cut for silage - grazed	50	29	17	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	871
Cut for silage - not grazed	55	22	13	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	218
All cut for silage	51	28	16	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1089
Cut for hay - grazed	67	23	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	344
Cut for hay - not grazed	70	16	9	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76
All cut for hay	68	22	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420
All mowings	55	26	15	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1458
All grass	63	25	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2758

Source: British Survey of Fertiliser Practice 2012

Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2012

	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	23	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1254
Grazed mown	50	20	17	7	3	2	-	-	-	-	-	-	-	-	-	-	-	-	1177
All grazings	62	22	11	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2431
Cut for silage - grazed	44	21	19	9	4	3	-	-	-	-	-	-	-	-	-	-	-	-	871
Cut for silage - not grazed	48	15	18	9	6	2	2	-	-	-	-	-	-	-	-	-	-	-	218
All cut for silage	45	20	19	9	4	3	1	-	-	-	-	-	-	-	-	-	-	-	1089
Cut for hay - grazed	68	19	9	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	344
Cut for hay - not grazed	70	7	17	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	76
All cut for hay	68	17	10	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	420
All mowings	51	19	17	7	3	2	1	-	-	-	-	-	-	-	-	-	-	-	1458
All grass	62	21	11	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2758

Source: British Survey of Fertiliser Practice 2012

Table EW3.0 Product use by month of application, England & Wales 2012

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	9	37	32	16	3	2	1
Straight P	18	21	3	1	5	11	24	4	5	1	0	8
Straight K	4	8	9	2	5	19	37	8	4	1	0	2
Compounds	9	5	2	0	1	6	23	25	14	6	3	5
All fertilisers	4	2	1	0	1	9	32	28	15	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	7	34	33	17	4	2	1
Phosphate	15	11	3	0	3	9	23	17	10	2	1	6
Potash	10	9	4	1	3	11	27	17	9	4	2	4
Total	4	3	1	0	1	8	32	28	15	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 2012.

'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, Table B2.5.

Source: British Survey of Fertiliser Practice 2012

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2012

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	43.8	51.8	10.3	26.4	50.5	23.5	45.8	32.8	35.5	29.5	32.8	32.8	43.0
Urea	4.2	11.2	0.7	4.5	12.6	4.0	9.4	3.7	4.9	4.3	0.8	3.8	8.2
Calcium Ammonium Nitrate (CAN)	1.4	0.4	0.4	0.6	0.4	2.4	0.7	1.4	1.8	1.5	0.8	1.6	0.9
Urea Ammonium Nitrate (UAN)	5.4	9.7	2.0	4.5	10.3	2.7	8.3	1.9	3.2	2.9	8.7	2.5	7.0
Other Straight N	2.9	2.5	1.1	0.0	5.8	3.0	2.9	1.4	0.5	1.2	1.6	1.2	2.5
Triple Superphosphate (TSP)	2.3	3.1	1.5	0.1	2.1	3.7	2.7	0.3	0.0	0.3	3.5	0.5	2.2
Other Straight P	0.0	0.1	0.1	0.0	0.0	0.4	0.1	0.3	0.9	0.1	0.0	0.3	0.1
Muriate of Potash (MOP)	3.1	3.0	9.3	1.9	2.7	8.7	3.6	0.4	0.3	0.5	5.4	0.5	2.9
Other Straight K	0.1	0.2	0.3	19.2	0.4	1.9	1.2	0.1	0.0	0.2	0.0	0.2	1.0
PK	11.1	11.4	2.8	27.8	8.0	15.0	11.4	2.3	2.8	2.8	1.6	2.6	9.4
NK	1.1	0.3	2.4	1.3	0.1	5.3	0.8	5.4	2.6	8.7	0.7	6.0	2.0
Low N (<19% N)	6.1	2.4	65.8	7.7	4.8	18.8	7.5	2.3	1.8	1.9	11.0	2.3	6.4
High N (>=19% N)	18.3	3.6	1.7	0.4	1.4	8.7	4.8	47.4	45.4	45.6	33.1	45.5	13.7
Other	0.2	0.3	1.6	5.6	1.0	1.8	0.8	0.3	0.3	0.4	0.0	0.3	0.7
Total product ('000 tonnes)	**180**	**1448**	**72**	**91**	**463**	**109**	**2363**	**774**	**83**	**462**	**16**	**897**	**3260**

Source: British Survey of Fertiliser Practice 2012

Table EW3.2 Use of product type by crop group, England & Wales 2012

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	7.5	67.5	0.5	2.1	20.1	2.2	79.5	86.6	11.4	46.8	2.1	20.5	1344
Urea	3.5	68.5	0.8	1.2	24.7	1.3	90.7	84.9	8.4	62.6	0.5	9.3	314
Calcium Ammonium Nitrate (CAN)	22.5	46.0	1.0	5.2	10.9	14.5	58.4	84.0	8.7	45.5	0.5	41.6	38
Urea Ammonium Nitrate (UAN)	4.8	69.1	0.7	1.9	22.4	1.1	91.6	52.6	10.2	71.0	6.4	8.4	284
Other Straight N	5.9	45.4	1.0	0.0	43.4	4.2	93.9	99.7	2.0	40.2	2.5	6.1	70
Triple Superphosphate (TSP)	6.6	67.0	0.6	0.1	16.5	9.3	94.9	79.9	0.0	15.8	10.4	5.1	62
Other Straight P	0.0	77.8	8.0	0.0	0.0	14.2	47.1	100.0	18.1	15.2	0.0	52.9	7
Muriate of Potash (MOP)	9.1	49.6	6.3	2.0	13.1	19.9	95.4	72.9	2.6	57.6	16.8	4.6	70
Other Straight K	1.4	15.3	2.8	66.6	7.7	6.3	95.6	67.4	0.0	83.3	0.0	4.4	24
PK	7.7	60.7	0.2	11.7	13.8	5.9	94.7	82.1	8.6	57.4	0.7	5.3	283
NK	17.0	32.8	9.1	7.3	4.3	29.5	20.1	79.2	6.0	84.7	0.1	79.9	79
Low N (<19% N)	6.7	20.9	39.8	4.4	14.5	13.6	91.4	82.1	9.5	51.0	16.2	8.6	146
High N (>=19% N)	34.4	46.5	0.2	0.5	8.8	9.5	13.8	89.3	8.5	48.4	1.3	86.2	516
Other	2.3	21.7	4.5	16.9	23.2	31.4	89.7	63.5	12.2	77.6	0.0	10.3	23
All Fertilisers	**7.6**	**61.3**	**3.1**	**3.9**	**19.6**	**4.6**	**72.5**	**86.2**	**9.2**	**51.5**	**1.8**	**27.5**	**3260**

Source: British Survey of Fertiliser Practice 2012

Table EW3.3 Product use by month of application, England & Wales 2012

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	7.7	35.6	32.9	17.5	2.9	2.0	0.7	0.4	0.2	0.0	0.0	1344
Urea	0.0	14.1	39.7	28.0	10.8	4.1	3.0	0.1	0.2	0.0	0.1	0.0	314
Calcium Ammonium Nitrate (CAN)	0.0	4.7	32.9	35.5	11.8	9.0	2.6	3.4	0.0	0.0	0.0	0.0	38
Urea Ammonium Nitrate (UAN)	0.0	7.9	37.7	34.4	17.1	1.6	0.4	0.2	0.6	0.1	0.0	0.0	284
Other Straight N	0.0	29.4	55.2	7.7	3.7	1.0	1.9	0.0	0.6	0.1	0.4	0.0	70
Triple Superphosphate (TSP)	5.2	11.6	26.0	3.8	3.6	0.1	0.0	5.1	20.0	20.4	3.7	0.6	62
Other Straight P	0.0	6.2	0.0	3.8	13.6	6.8	0.0	31.3	11.6	26.7	0.0	0.0	7
Muriate of Potash (MOP)	3.8	18.0	40.6	10.2	4.8	1.0	0.0	1.9	5.0	6.4	5.9	2.6	70
Other Straight K	9.3	23.6	25.9	2.6	0.1	1.9	0.0	2.7	1.8	13.1	19.0	0.0	24
PK	5.3	10.8	15.0	6.7	1.6	0.0	0.0	8.8	28.7	17.5	4.9	0.6	283
NK	0.0	1.3	17.5	14.5	16.0	28.9	13.6	6.5	0.7	0.9	0.1	0.0	79
Low N (<19% N)	0.0	9.1	35.8	27.4	10.6	1.3	0.7	6.3	5.0	2.5	1.4	0.0	146
High N (>=19% N)	0.0	2.4	24.7	35.1	21.2	7.8	4.5	3.2	0.8	0.1	0.1	0.0	516
Other	2.6	36.8	17.6	2.1	1.4	0.0	0.0	4.8	1.4	0.7	19.2	13.5	23
All Fertilisers	**0.8**	**8.7**	**32.3**	**27.9**	**14.5**	**3.9**	**2.3**	**2.3**	**3.7**	**2.4**	**1.0**	**0.2**	**3260**

Source: British Survey of Fertiliser Practice 2012

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2012

		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	94	40	56	74	144	58	90	135	23	50	115
	All grass	71	45	50	50	98	18	29	70	8	15	301
	All crops and grass	74	45	51	53	105	22	37	77	10	19	416
North East	All tillage	93	60	60	15	177	58	80	165	35	48	195
	All grass	37	30	30	26	81	24	29	30	7	9	195
	All crops and grass	57	41	41	22	136	41	55	77	17	22	390
Eastern	All tillage	91	36	29	12	162	60	79	148	22	23	873
	All grass	43	9	8	14	83	28	36	35	2	3	136
	All crops and grass	85	32	26	12	157	59	77	133	19	20	1009
Yorkshire and the Humber	All tillage	94	45	52	22	167	66	91	157	30	48	782
	All grass	68	34	37	40	86	21	29	59	7	11	275
	All crops and grass	85	42	47	29	145	53	74	123	22	35	1057
West Midlands	All tillage	93	33	40	26	159	59	90	147	20	36	420
	All grass	69	36	37	40	90	19	28	62	7	10	282
	All crops and grass	80	35	38	34	126	37	57	100	13	22	702
East Midlands	All tillage	95	40	43	18	171	65	78	163	26	33	592
	All grass	61	43	40	26	99	24	30	60	10	12	179
	All crops and grass	84	41	42	21	154	51	63	130	21	27	771
South West	All tillage	84	49	47	38	143	50	68	120	24	32	635
	All grass	58	34	36	48	96	22	32	56	7	11	730
	All crops and grass	67	39	40	45	116	34	46	77	13	18	1365
South East	All tillage	84	40	39	21	169	57	74	142	23	29	444
	All grass	33	12	11	8	71	20	23	24	2	3	225
	All crops and grass	63	28	27	16	147	50	65	92	14	18	669
Wales	All tillage	94	62	57	63	116	49	62	109	30	35	112
	All grass	61	53	53	37	93	21	26	57	11	14	435
	All crops and grass	64	54	53	39	96	24	30	62	13	16	547

Source: British Survey of Fertiliser Practice 2012

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2012

		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	43	42	33	157	51	71	134	22	30	330
	All grass	49	23	23	49	95	30	36	47	7	8	283
	All crops and grass	65	32	32	42	131	42	57	85	14	18	613
Anglia	All tillage	91	36	29	12	162	60	79	148	22	23	873
	All grass	43	9	8	14	83	28	36	35	2	3	136
	All crops and grass	85	32	26	12	157	59	77	133	19	20	1009
Northern	All tillage	92	57	59	25	159	54	83	146	31	49	212
	All grass	63	45	49	42	90	19	28	57	8	14	388
	All crops and grass	69	47	51	39	107	27	40	74	13	20	600
North East	All tillage	94	47	54	23	168	64	88	158	30	47	842
	All grass	67	38	40	41	82	22	28	56	9	11	334
	All crops and grass	84	44	48	30	141	50	69	118	22	33	1176
North Mercia	All tillage	96	28	47	46	160	62	97	154	17	46	166
	All grass	56	30	33	48	120	21	34	67	6	11	201
	All crops and grass	66	29	37	48	134	31	54	89	9	20	367
South Mercia	All tillage	90	35	37	24	160	64	94	145	22	35	317
	All grass	70	27	27	25	70	17	22	49	5	6	147
	All crops and grass	81	31	32	25	125	46	67	102	14	22	464
East Midland	All tillage	95	40	43	18	171	65	78	163	26	33	592
	All grass	61	43	40	26	99	24	30	60	10	12	179
	All crops and grass	84	41	42	21	154	51	63	130	21	27	771
South East	All tillage	84	40	39	21	169	57	74	142	23	29	444
	All grass	33	12	11	8	71	20	23	24	2	3	225
	All crops and grass	63	28	27	16	147	50	65	92	14	18	669
South West	All tillage	80	64	59	52	109	46	59	87	30	35	280
	All grass	66	43	47	48	98	19	30	64	8	14	430
	All crops and grass	68	47	50	49	101	27	38	69	13	19	710
Wales	All tillage	94	62	57	63	116	49	62	109	30	35	112
	All grass	61	53	53	37	93	21	26	57	11	14	435
	All crops and grass	64	54	53	39	96	24	30	62	13	16	547

Source: British Survey of Fertiliser Practice 2012

Table SC1.1 Total fertiliser use, Scotland 2012

	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	75	87	12	185	62	83	182	47	73	102
Spring barley	99	96	97	34	105	53	68	103	50	66	251
Winter barley	100	82	90	16	156	61	78	156	50	70	46
Oats	76	65	71	42	109	54	69	82	35	49	51
Potatoes	90	94	94	13	127	117	207	114	109	194	16
Winter oilseed rape	100	88	87	21	180	48	58	180	43	50	34
Other crops	68	60	60	31	99	79	79	68	48	47	85
All tillage	95	86	90	28	127	57	75	121	50	67	585
Grass less than five years old	86	76	77	35	112	32	41	96	24	32	280
Grass five years and over	61	52	52	19	78	20	23	48	10	12	406
All grass	67	57	58	23	89	24	29	60	14	17	686
All crops and grass	76	67	68	24	104	38	48	79	25	33	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.2 Use of straight fertiliser, Scotland 2012

	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	89	5	15	159	66	86	141	3	13	102
Spring barley	67	1	5	72	-	67	48	-	3	251
Winter barley	94	5	16	140	-	89	132	-	14	46
Oats	53	1	8	104	-	-	55	-	-	51
Potatoes	44	0	41	81	-	174	36	-	71	16
Winter oilseed rape	100	8	14	152	-	46	152	-	6	34
Other crops	28	1	3	100	-	-	28	-	-	85
All tillage	70	2	9	106	69	87	74	2	7	585
Grass less than five years old	29	1	1	92	99	-	26	1	-	280
Grass five years and over	15	0	0	82	-	-	12	-	-	406
All grass	18	0	0	86	95	-	16	0	-	686
All crops and grass	34	1	3	99	75	87	34	1	2	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.3 Use of compound fertiliser, Scotland 2012

	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	41	72	76	98	60	79	41	44	59	102
Spring barley	92	95	95	60	52	67	55	50	63	251
Winter barley	43	77	77	55	59	73	24	46	56	46
Oats	36	64	64	75	54	69	27	35	44	51
Potatoes	90	94	81	87	117	151	78	109	123	16
Winter oilseed rape	56	80	73	50	47	60	28	38	44	34
Other crops	53	58	57	76	79	77	40	46	44	85
All tillage	72	84	84	66	57	71	47	48	60	585
Grass less than five years old	72	75	76	96	31	41	69	23	31	280
Grass five years and over	51	51	52	71	20	23	36	10	12	406
All grass	56	57	58	79	24	29	44	13	17	686
All crops and grass	61	66	66	74	37	46	45	24	30	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.4 Use of lime, Scotland 2012

	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	10.0	-	5.6	-	3.8	19.4	1.5	-	5.0	-	0.4	2.3	14	102
Spring barley	11.1	0.3	2.4	-	9.3	23.1	3.3	4.0	3.0	-	1.3	2.5	69	251
Winter barley	-	-	-	-	-	-	-	-	-	-	-	-	2	46
Oats	6.7	-	3.9	-	3.5	14.0	1.6	-	5.0	-	0.4	2.2	8	51
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	16
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	34
Other crops	4.4	-	4.9	-	3.5	12.8	4.7	-	5.0	-	0.5	3.7	16	85
All tillage	9.6	0.2	2.9	-	6.5	19.1	3.0	4.0	4.1	-	1.1	2.6	113	585
Grass less than five years old	1.9	-	2.3	-	1.4	5.6	4.4	-	5.0	-	0.5	3.7	31	280
Grass five years and over	1.3	-	1.2	-	0.4	2.8	4.2	-	4.9	-	0.6	4.0	23	406
All grass	1.4	-	1.5	-	0.6	3.5	4.3	-	4.9	-	0.6	3.9	54	686
All crops and grass	4.0	0.0	1.9	-	2.5	8.5	3.3	4.0	4.5	-	1.0	2.9	167	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2012

	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	3	0	6	2	8	12	23	25	17	2	-	-	-	-	-	-	102
Spring barley	1	0	4	11	25	36	18	3	2	-	-	-	-	-	-	-	-	-	251
Winter barley	0	0	0	1	10	13	18	30	11	9	8	-	-	-	-	-	-	-	46
Oats	24	0	2	11	10	32	14	7	-	-	-	-	-	-	-	-	-	-	51
Potatoes	10	0	0	0	40	3	16	7	19	2	0	0	0	0	2	-	-	-	16
Winter oilseed rape	0	0	0	0	11	0	11	7	44	15	6	5	-	-	-	-	-	-	34
Other crops	32	0	13	10	24	10	2	6	2	1	0	0	0	0	0	2	-	-	85
All tillage	5	0	4	8	20	24	14	7	9	6	4	1	-	-	-	-	-	-	585
Grass less than five years old	14	0	9	15	17	12	12	5	6	3	1	2	1	-	-	-	-	-	280
Grass five years and over	39	1	14	25	7	6	3	1	2	-	-	-	-	-	-	-	-	-	406
All grass	33	1	13	22	10	8	5	2	3	1	0	1	-	-	-	-	-	-	686
All crops and grass	24	0	10	18	13	13	8	4	5	3	1	1	-	-	-	-	-	-	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2012

	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	25	6	8	39	20	0	1	-	-	-	-	-	-	-	-	-	-	-	102
Spring barley	4	7	34	41	13	-	-	-	-	-	-	-	-	-	-	-	-	-	251
Winter barley	18	8	13	42	17	2	-	-	-	-	-	-	-	-	-	-	-	-	46
Oats	35	9	7	35	13	-	-	-	-	-	-	-	-	-	-	-	-	-	51
Potatoes	6	0	3	0	26	37	10	10	5	0	2	-	-	-	-	-	-	-	16
Winter oilseed rape	12	20	22	30	14	3	-	-	-	-	-	-	-	-	-	-	-	-	34
Other crops	40	11	12	5	11	7	6	1	6	-	-	-	-	-	-	-	-	-	85
All tillage	14	8	23	36	15	2	1	0	1	-	-	-	-	-	-	-	-	-	585
Grass less than five years old	24	39	22	9	3	2	-	-	-	-	-	-	-	-	-	-	-	-	280
Grass five years and over	48	34	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	406
All grass	43	36	17	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	686
All crops and grass	33	27	19	14	5	1	-	-	-	-	-	-	-	-	-	-	-	-	1271

Source: British Survey of Fertiliser Practice 2012

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2012

	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	13	3	11	10	43	13	7	1	1	-	-	-	-	-	-	-	-	-	102
Spring barley	3	3	19	37	28	8	2	-	-	-	-	-	-	-	-	-	-	-	251
Winter barley	10	8	3	33	26	13	7	-	-	-	-	-	-	-	-	-	-	-	46
Oats	29	7	10	25	20	9	1	-	-	-	-	-	-	-	-	-	-	-	51
Potatoes	6	0	0	3	0	0	0	15	41	11	0	0	19	2	0	0	2	-	16
Winter oilseed rape	13	16	13	30	18	10	-	-	-	-	-	-	-	-	-	-	-	-	34
Other crops	40	9	11	10	14	2	11	0	1	2	-	-	-	-	-	-	-	-	85
All tillage	10	5	14	28	28	9	4	0	1	-	-	-	-	-	-	-	-	-	585
Grass less than five years old	23	29	22	16	5	3	1	-	-	-	-	-	-	-	-	-	-	-	280
Grass five years and over	48	33	14	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	406
All grass	42	32	16	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	686
All crops and grass	32	23	16	14	10	3	1	-	-	-	-	-	-	-	-	-	-	-	1271

Source: British Survey of Fertiliser Practice 2012

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2012

	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	59	49	49	14	70	19	20	41	9	10	366
Grazed mown	86	79	80	29	117	29	41	101	23	33	131
All grazings	63	54	54	17	80	21	25	51	11	13	497
Cut for silage - grazed	92	83	84	33	124	30	43	114	25	36	112
Cut for silage - not grazed	94	80	83	61	124	33	45	116	26	38	160
All cut for silage	93	81	84	49	124	32	44	115	26	37	272
Cut for hay - grazed	64	64	64	9	71	23	27	46	15	17	20
Cut for hay - not grazed	70	66	57	26	81	31	28	56	21	16	27
All cut for hay	66	65	61	16	75	27	27	50	17	17	47
All mowings	89	78	80	44	119	31	42	105	25	34	316
All grass	67	57	58	23	89	24	29	60	14	17	686

Source: British Survey of Fertiliser Practice 2012

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2012

	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	41	1	16	24	9	4	3	1	1	1	-	-	-	-	-	-	-	-	366
Grazed mown	14	0	3	25	10	13	15	6	9	2	1	3	-	-	-	-	-	-	131
All grazings	37	1	14	24	9	6	5	1	2	1	-	-	-	-	-	-	-	-	497
Cut for silage - grazed	8	0	4	21	10	13	19	7	11	2	1	4	-	-	-	-	-	-	112
Cut for silage - not grazed	6	1	5	15	13	22	9	7	11	3	2	3	3	-	-	-	-	-	160
All cut for silage	7	0	4	18	12	18	14	7	11	2	2	3	1	-	-	-	-	-	272
Cut for hay - grazed	36	0	3	39	8	12	0	2	-	-	-	-	-	-	-	-	-	-	20
Cut for hay - not grazed	30	3	5	24	15	13	1	9	-	-	-	-	-	-	-	-	-	-	27
All cut for hay	34	1	4	33	11	13	1	5	-	-	-	-	-	-	-	-	-	-	47
All mowings	11	0	4	20	12	17	12	7	9	2	1	3	1	-	-	-	-	-	316
All grass	33	1	13	22	10	8	5	2	3	1	0	1	-	-	-	-	-	-	686

Source: British Survey of Fertiliser Practice 2012

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2012

	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	36	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	366
Grazed mown	21	38	32	7	3	-	-	-	-	-	-	-	-	-	-	-	-	-	131
All grazings	46	36	15	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	497
Cut for silage - grazed	17	41	32	7	3	-	-	-	-	-	-	-	-	-	-	-	-	-	112
Cut for silage - not grazed	20	33	29	12	3	3	-	-	-	-	-	-	-	-	-	-	-	-	160
All cut for silage	19	37	30	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	272
Cut for hay - grazed	36	29	31	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Cut for hay - not grazed	34	35	22	0	0	9	-	-	-	-	-	-	-	-	-	-	-	-	27
All cut for hay	35	31	28	2	0	4	-	-	-	-	-	-	-	-	-	-	-	-	47
All mowings	22	35	30	9	2	2	-	-	-	-	-	-	-	-	-	-	-	-	316
All grass	43	36	17	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	686

Source: British Survey of Fertiliser Practice 2012

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2012

	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	34	12	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	366
Grazed mown	20	29	25	18	2	2	2	1	-	-	-	-	-	-	-	-	-	-	131
All grazings	46	34	14	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	497
Cut for silage - grazed	16	31	22	21	3	3	3	1	-	-	-	-	-	-	-	-	-	-	112
Cut for silage - not grazed	17	23	25	23	8	5	-	-	-	-	-	-	-	-	-	-	-	-	160
All cut for silage	16	27	24	22	6	4	1	-	-	-	-	-	-	-	-	-	-	-	272
Cut for hay - grazed	36	25	34	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Cut for hay - not grazed	43	25	24	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
All cut for hay	39	25	30	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
All mowings	20	26	25	19	5	3	1	-	-	-	-	-	-	-	-	-	-	-	316
All grass	42	32	16	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	686

Source: British Survey of Fertiliser Practice 2012

Table SC3.0 Product use by month of application, Scotland 2012

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	5	23	37	25	6	4	1
Straight P	14	0	0	0	0	0	33	28	16	0	1	8
Straight K	8	0	0	0	0	18	31	33	2	0	3	4
Compounds	2	1	0	0	0	1	26	42	17	5	3	2
All fertilisers	2	1	0	0	0	3	25	40	19	5	3	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	2	22	42	22	7	4	1
Phosphate	4	3	0	0	0	2	34	34	14	3	1	4
Potash	3	1	0	0	0	4	35	35	14	3	2	3
Total	2	1	0	0	0	3	27	39	18	5	3	2

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

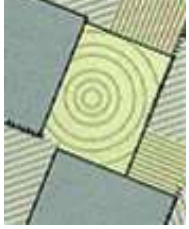
'Product' refers to the total tonnage of the products used by the farmers in the survey year 2012.

'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, Table B2.5.

Source: British Survey of Fertiliser Practice 2012



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2012

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 compost, paper waste or brewery effluent.

Of the 1,409 farms in the survey, around 70% (948) 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, 2012

	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	460	698	278	35	17	44	44	53	13	60	39	948
Farms in population	32,369	43,461	16,980	1,497	681	2,124	1,866	3,901	654	2,591	1,493	57,763
Farms in population %	36%	48%	19%	2%	1%	2%	2%	4%	1%	3%	2%	64%
Volume (Mt; Mm^3)	n/a	31.2	43.7	1.3	2.3	0.7	0.7	1.8	1.8	3.7	1.8	89.0
Volume %	n/a	35%	49%	2%	3%	1%	1%	2%	2%	4%	2%	100%

Note: some farmers may use more than one type of manure. Mt; Mm^3 are Million tonnes and cubic metres.

Table D1.1b Percentage (%) of farms using each type of manure in Great Britain, 2008 - 2012

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
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
2012	36	48	19	2	1	2	2	4	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 7% since 2008, whereas the use of cattle slurry is more consistent over the period and used on 19% of farms in 2012. 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.

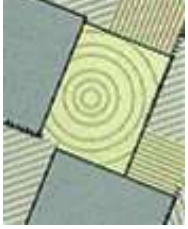


Table D1.2 Estimated volumes of exported manures and percentage (%) of farms exporting manures of each type, Great Britain 2008 - 2012

	cattle FYM		*cattle slurry*		*other*		*farms in population*
	vol Mt	*%*	*vol Mm³*	*%*	*vol Mt*	*%*	
2008	0.5	1.7	0.1	0.5	0.1	1.0	89,241
2009	0.8	1.4	0.5	0.3	0.0	0.1	89,404
2010	0.6	1.6	1.2	0.5	0.0	0.5	88,901
2011	0.6	1.9	0.3	0.4	0.1	0.7	90,386
2012	0.8	2.4	0.2	0.4	0.4	0.9	90,132

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 2008-12. 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, Mt or Mm³, Great Britain 2008 - 2012

	cattle FYM/ slurry	*pig FYM/ slurry*	*layer/hen manure*	*broiler/ turkey litter*	*other FYM*	*bio-solids*	*composted green manure*	*other*	*farms in population*
2008	0.8	0.6	0.2	0.6	0.1	1.5	1.5	2.5	89,241
2009	1.6	0.6	0.3	0.5	0.1	3.8	1.1	0.7	89,404
2010	1.4	0.7	0.3	0.5	0.1	2.3	0.5	0.5	88,902
2011	1.7	0.5	0.2	0.5	0.1	2.5	1.2	0.7	90,386
2012	1.8	1.1	0.3	0.6	0.1	4.5	1.1	0.5	90,132

Note: some farmers imported more than one type of manure

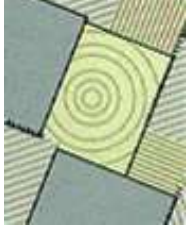
The amount of imported non-farm manures increased each year between 2003 and 2009 to 5.6 million tonnes. In 2012 this volume of imported non farm manures is higher at 6.1 million tonnes. However, care should be taken with the interpretation of these figures given the small number of farms involved. Cattle and pig FYM are the farm-produced manures most likely to be imported.

Note that there is an imbalance between the estimate of manures exported from farms (1.4 million tonnes in 2012) and the estimate of imports (3.9 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 2.0 million tonnes of imports were recorded.

Table D1.3b Percentage (%) of farms importing manures of each type, Great Britain 2008 - 2012

	cattle FYM/ slurry	*pig FYM/ slurry*	*layer/hen manure*	*broiler/ turkey litter*	*other FYM*	*bio-solids*	*composted green manure*	*other*	*farms in population*
2008	3.1	0.7	1.4	2.0	0.4	1.9	0.6	0.9	89,241
2009	2.9	1.2	1.2	1.6	0.2	2.2	0.4	0.8	89,404
2010	2.0	1.2	1.2	2.1	0.3	2.6	0.6	1.0	88,902
2011	2.9	1.0	0.8	1.7	0.2	2.3	1.2	0.7	90,386
2012	3.3	1.3	1.1	1.8	0.3	2.8	1.1	0.7	90,132

In 2012 the percentage of farms importing cattle manures increased to 3.3% and the proportion of farms importing bio-solids 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 for both types of slurry.

Table D1.4 Number and percentage (%) of farms using each type of application method by slurry type, Great Britain 2012

			percentage of farms					
	farms in sample	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry	278	16,980	82	8	10	1	1	0
Pig slurry	17	681	61	34	14	0	0	0
Grand Total	292	17,491	81	9	10	1	1	0

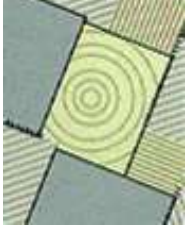
Note: some farms may apply both types of slurry

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. Farmyard manure is the most extensively incorporated at 96% of the area with 91% of it incorporated within a week of spreading on tillage fields. Cattle and pig slurries are less likely to be incorporated with 35% and 80% of the volume respectively not incorporated. The high proportion of the pig slurry which is not incorporated is thought to be due in part to its application as a spring top-dressing to winter sown crops (see Table D2.4).

Table D1.5 Percentage (%) of organic manure incorporated (volume and area) on tillage fields by incorporation time and manure/slurry type, Great Britain 2012

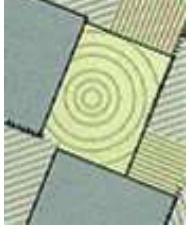
	incorporation time after spreading										*total*	
	not incorporated		*within 6 hours*		*between 6 and 24 hours*		*between 1 and 7 days*		*more than 1 week*		*applied area*	*volume applied*
	%area	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*'000 ha*	*'Mt; Mm³*
FYM	4	3	9	10	30	29	47	48	9	9	609	14.2
Cattle slurry	37	35	5	6	25	20	20	25	13	11	107	3.4
Pig slurry	78	80	7	10	7	5	8	4	0	0	51	1.7
Poultry FYM	10	7	10	9	63	64	14	15	3	4	179	1.4
Other	1	2	9	25	30	48	49	19	10	6	592	4.7
Total	8	12	9	12	33	32	41	35	9	8	1,538	25.3



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 higher than in previous years at 33% and 27% respectively. Where contractors were used they were applying between 82% and 87% of the manure on average.

Table D1.6 Use of contractors to spread manure/slurry in current season, Great Britain 2012

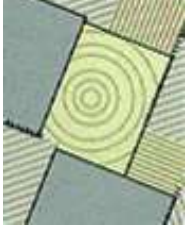
	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	33	36	82
Cattle slurry	27	23	87
Other	53	45	87
Total	32	32	84



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 2008 - 2012

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
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
2012	15	10	1	1	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 2008 – 2012

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
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	56	30	2	1	2	3	3	9
2012	51	34	2	2	3	3	4	9

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

The percentage of the sown area receiving an application of cattle FYM in 2012 was 15%, which is consistent over the five year period. Cattle FYM and cattle slurry were applied to 85% of the sown area receiving organic manure.

The levels of nutrient in 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.

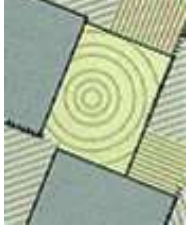


Table D2.2 Typical dry matter and nutrient content of different organic manure types[12]

	dry matter (%)	*total N (kg/t; kg/m^3)*	*total P_2O_5 (kg/t; kg/m^3)*	*total K_2O (kg/t; kg/m^3)*
Cattle FYM	25	6.0	3.2	8.0
Pig FYM	25	7.0	6.0	8.0
Sheep FYM	25	7.0	3.2	8.0
Duck manure	25	6.5	5.5	7.5
Layer hen manure	35	19.0	14.0	9.5
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	70.0	2.0
Lime stabilised	40	8.5	26.0	0.8
Composted	60	11.0	6.0	3.0
Compost-green	60	7.5	3.0	5.5
Compost-green/food	60	11.0	3.8	8.0

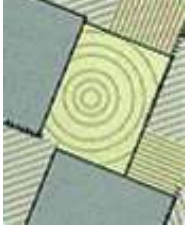
In Table D2.3, crops receiving manure applications have been classified as either “winter sown”, “spring sown” or “grass” and their average treated areas and manure application rates shown.

Table D2.3a Treated areas and average manure field application rates to winter sown and spring sown crops and grassland by manure type, Great Britain 2012

	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 %	4.3	0.4	0.4	0.8	1.2	1.1	0.2	-	2.0	0.8
Treated area (ha)	235,382	23,819	20,422	43,034	68,956	58,638	12,160	-	112,143	45,368
Avg manure rate (t; m^3/ha)	22	27	26	35	7	7	23	-	18	26
Volume (Mt; Mm^3)	5.2	0.7	0.5	1.5	0.5	0.4	0.3	-	2.1	1.2
Fields in sample	320	43	20	24	45	43	14	0	72	42
Spring sown										
Treated area %	23.3	6.5	2.5	0.6	1.1	2.4	1.0	-	2.5	1.2
Treated area (ha)	298,383	82,921	32,304	7,639	14,277	30,976	13,173	-	32,192	15,470
Avg manure rate (t; m^3/ha)	24	34	25	26	5	8	24	-	32	25
Volume (Mt; Mm^3)	7.1	2.8	0.8	0.2	0.1	0.2	0.3	-	1.0	0.4
Fields in sample	451	110	36	11	15	46	18	0	31	26
Grass										
Treated area %	38.0	48.0	-	0.9	0.7	0.2	3.5	1.7	0.5	0.5
Treated area (ha)	1,177,521	1,485,285	-	27,369	21,637	5,964	107,578	52,448	15,447	16,610
Avg manure rate (t; m^3/ha)	15	27	-	21	4	10	11	34	40	11
Volume (Mt; Mm^3)	18.0	40.3	-	0.6	0.1	0.1	1.2	1.8	0.6	0.2
Fields in sample	686	597	2	19	14	7	50	25	10	7

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

[12] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site: https://www.gov.uk/government/publications/fertiliser-manual-rb209



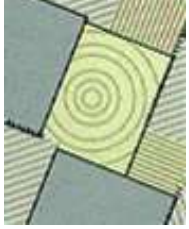
The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure within the farm on which it is produced. Conversely, non-farm manures such as biosolids appear to be favoured on winter sown tillage land.

Table D2.3b Cattle FYM treated areas and average manure field application rates to winter sown and spring sown crops and grassland by farm type, Great Britain 2012

Cattle FYM	*Cereals*	*Dairy*	*General cropping*	*Mixed*	*Other livestock*	*All farm types*
Winter sown						
Treated area %	28.4	8.9	8.3	33.7	20.3	99.9
Treated area (ha)	66,836	20,898	19,439	79,360	47,740	235,382
Avg manure rate (t; m^3/ha)	18	24	36	23	20	22
Volume (Mt; Mm^3)	1.2	0.5	0.7	1.8	0.9	5.2
Fields in sample	64	45	26	103	81	320
Spring sown						
Treated area %	15.7	23.6	17.3	20.7	22.3	99.9
Treated area (ha)	46,786	70,656	51,751	61,715	66,673	298,383
Avg manure rate (t; m^3/ha)	21	27	26	22	22	24
Volume (Mt; Mm^3)	1.0	1.9	1.4	1.4	1.4	7.1
Fields in sample	45	114	69	91	130	451
Grass						
Treated area %	0.7	13.2	2.7	4.6	78.6	99.9
Treated area (ha)	8,172	155,644	31,986	54,803	926,915	1,177,521
Avg manure rate (t; m^3/ha)	16	22	10	20	14	15
Volume (Mt; Mm^3)	0.1	3.4	0.3	1.1	13.0	18.0
Fields in sample	10	84	13	44	535	686

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.

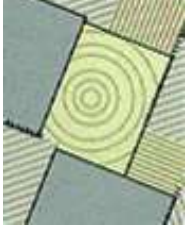
Table 2.3b shows a breakdown of the cattle FYM applications by robust farm type. Mixed farms have the most extensive treatments of cattle FYM on winter sown crops at 33.7% of the treated area. On grass 78.6% of the treated area (with Cattle FYM) is on Other Livestock robust classification farms.



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 each organic manure type applied, by sowing season and timing, Great Britain 2012

	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	3	0	11	5	23	20	3	0	30	20
September	8	1	26	3	31	33	7	0	33	34
October	2	0	0	2	4	4	0	0	6	5
Winter (Nov, Dec, Jan)	0	0	0	0	0	0	0	0	0	2
Spring (Feb, Mar, Apr)	0	0	0	40	7	4	0	0	0	0
Summer (May, Jun, Jul)	1	0	0	0	1	0	0	0	1	0
Spring sown										
August	0	0	0	0	0	1	0	0	0	0
September	0	0	17	0	0	0	0	0	0	0
October	1	0	3	0	0	0	0	0	1	0
Winter (Nov, Dec, Jan)	2	1	3	0	0	0	1	0	9	6
Spring (Feb, Mar, Apr)	13	4	35	7	11	31	9	0	9	11
Summer (May, Jun, Jul)	1	1	1	3	3	0	0	0	2	2
Grass										
August	5	2	0	0	1	0	26	10	1	0
September	5	2	0	0	0	0	3	2	0	0
October	5	3	0	0	3	0	6	10	0	0
Winter (Nov, Dec, Jan)	10	13	0	0	0	0	10	1	1	4
Spring (Feb, Mar, Apr)	32	48	3	29	16	6	31	41	1	10
Summer (May, Jun, Jul)	11	24	0	10	1	0	4	37	8	6



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[13]. 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.

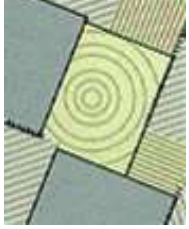
Table D3.1a Dressing cover (%) and application rates (kg/ha) of manufactured fertiliser to tillage crops in Great Britain, with and without applications of organic manure, 2012

	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	24	46	28	43	314	1,347
Spring barley	98	99	72	72	75	77	222	398
Winter barley	98	100	38	57	42	60	114	394
Potatoes (maincrop)	90	99	76	81	74	84	48	60
Sugar beet	96	98	24	51	63	64	61	81
Winter oilseed rape	99	100	22	48	23	43	100	445

	nitrogen		*phosphate*		*potash*		*fields in sample*	
average field rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	170	190	54	62	74	78	314	1,347
Spring barley	97	107	44	50	55	67	222	398
Winter barley	143	145	47	58	65	73	114	394
Potatoes (maincrop)	149	137	142	129	246	248	48	60
Sugar beet	93	101	55	60	103	115	61	81
Winter oilseed rape	168	191	38	59	48	70	100	445

	nitrogen		*phosphate*		*potash*		*fields in sample*	
overall application rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	170	190	13	29	21	33	314	1,347
Spring barley	95	105	32	36	42	51	222	398
Winter barley	140	145	18	33	27	44	114	394
Potatoes (maincrop)	133	136	108	104	183	208	48	60
Sugar beet	89	99	13	31	65	73	61	81
Winter oilseed rape	166	191	8	28	11	30	100	445

[13] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site: https://www.gov.uk/government/publications/fertiliser-manual-rb209



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 3 kg/ha for potatoes to 25 kg/ha on winter oilseed rape, 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 71% 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 22% 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.

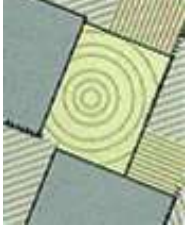
Table D3.1b Overall application rates (kg/ha) of manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2008 - 2012

	2008		*2009*		*2010*		*2011*		*2012*	
nitrogen (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	161	183	180	192	187	197	179	198	170	190
Spring barley	88	101	89	107	91	108	97	107	95	105
Winter barley	122	137	138	142	138	146	137	144	140	145
Potatoes (maincrop)	154	156	155	185	139	138	146	178	133	136
Sugar beet	80	89	88	101	87	96	81	99	89	99
Winter oilseed rape	159	197	176	191	175	204	174	203	166	191

	2008		*2009*		*2010*		*2011*		*2012*	
phosphate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	17	30	9	18	16	29	15	32	13	29
Spring barley	39	33	34	29	35	36	37	35	32	36
Winter barley	25	37	20	23	26	35	24	32	18	33
Potatoes (maincrop)	140	127	108	164	99	135	122	119	108	104
Sugar beet	15	39	13	24	11	38	10	36	13	31
Winter oilseed rape	14	31	5	23	10	33	10	30	8	28

	2008		*2009*		*2010*		*2011*		*2012*	
potash (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	31	37	21	23	26	32	30	34	21	33
Spring barley	48	48	39	43	45	50	47	47	42	51
Winter barley	41	53	29	35	36	50	34	49	27	44
Potatoes (maincrop)	260	227	176	291	163	230	199	213	183	208
Sugar beet	84	93	64	80	88	73	50	93	65	73
Winter oilseed rape	25	36	12	26	17	32	15	29	11	30

Differences in overall application rates with and without manures for nitrogen, phosphate and potash for the period 2008 to 2012 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 cereals at between 3% 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 field rates (kg/ha) of manufactured fertiliser application on grassland with and without applications of organic manure by robust type group, Great Britain 2012

	nitrogen (kg/ha)		*phosphate (kg/ha)*		*potash (kg/ha)*		*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 *	84	105	30	36	20	47	8	118
Grass 5 years and over *	107	74	24	27	31	32	10	254
All grass	95	84	27	30	26	38	18	372
Dairy								
Grass under 5 years old	158	146	32	33	55	64	154	52
Grass 5 years and over	136	111	24	21	37	27	235	156
All grass	143	118	26	24	42	35	389	208
General cropping								
Grass under 5 years old *	126	99	25	32	45	39	16	58
Grass 5 years and over *	120	90	25	22	40	28	19	133
All grass	123	92	25	24	41	31	35	191
Mixed								
Grass under 5 years old	123	114	27	33	43	43	35	111
Grass 5 years and over	105	82	22	22	38	26	41	225
All grass	112	92	24	26	40	33	76	336
Other livestock								
Grass under 5 years old	99	75	29	26	38	28	175	180
Grass 5 years and over	82	56	21	16	27	18	504	672
All grass	85	59	22	18	29	19	679	852
All farm types								
Grass under 5 years old	130	100	30	30	46	39	388	519
Grass 5 years and over	105	70	22	18	31	21	812	1,446
All grass	111	76	24	21	34	25	1,200	1,965

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, phosphate 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).

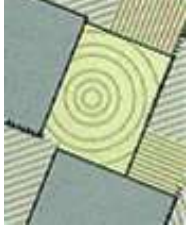


Table D3.3a Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2012

	nitrogen (kg/ha)		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
All cut for hay	122	83	28	23	42	36	16	17
All cut for silage	145	151	28	30	47	57	266	70
All grazings	138	113	24	21	38	30	320	190

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

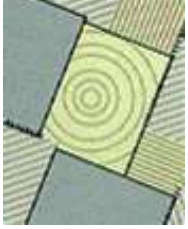
Table D3.3b Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2008 – 2012

all cut for hay	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2012	122	83	28	23	42	36	16	17

all cut for silage	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2012	145	151	28	30	47	57	266	70

all grazings	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2012	138	113	24	21	38	30	320	190

Mineral fertiliser application rates of nitrogen are variable over the 5 year period 2008-12 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 27-29 kg/ha for fields cut for silage and 24-28 kg/ha on all grazed fields. Potash average field rates for manured silage and grazed grass were in the range 47-50 kg/ha and 39-42 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 2012, 37% 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 seven percent of farmers never check their spreaders for accuracy.

Table D4.1 Frequency of spread pattern checks using catch trays, percentage (%) of those farms with a spreader, Great Britain 2008-2012

	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*
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
2012	8	7	6	8	37	27	13	3

Practices of checking are generally consistent over the five year period 2008-2012. The exception to this is an increase in contract applications which have risen from 4% of farms in 2008 to 13% of farms in 2012.

Table D4.2a Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2011/12 crop year, Great Britain 2012

	manufactured fertilisers		*organic manures*	
	farms	*farms %*	*farms*	*farms %*
No answer	0	0.0	0	0.0
Computer program	16,466	23.4	7,687	20.0
Farm diary	36,104	51.4	20,401	53.1
Farm notebook/pocketbook	14,798	21.1	7,844	20.4
File record sheet (file in the office)	14,333	20.4	7,840	20.4
Other paper record	792	1.1	644	1.7
No records kept	5,352	7.1	5,555	12.6

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 23% of farms, whereas no records were kept on 7% of farms. Computerised record keeping is less common for organic manures at 20% 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 44%, 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.

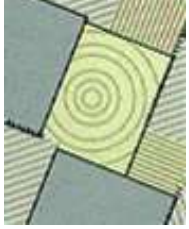


Table D4.2b Record keeping methods for fertiliser and manure applications on farms where each nutrient type was applied during the 2011/12 crop year, by farm type, Great Britain 2012

	manufactured fertilisers		*organic manures*	
Cereals	*farms*	*farms %*	*farms*	*farms %*
Computer program	7,002	43.9	1,935	36.4
Farm diary	6,473	40.6	2,386	44.8
Farm notebook/pocketbook	2,141	13.4	948	17.8
File record sheet (file in the office)	4,327	27.1	1,133	21.3
Other paper record	275	1.7	51	1.0
No records kept	153	1.0	0	0.0
	manufactured fertilisers		*organic manures*	
Dairy	*farms*	*farms %*	*farms*	*farms %*
Computer program	1,153	12.1	959	13.2
Farm diary	4,819	50.4	3,706	51.2
Farm notebook/pocketbook	1,653	17.3	1,319	18.2
File record sheet (file in the office)	2,581	27.0	2,104	29.1
Other paper record	53	0.6	53	0.7
No records kept	341	3.4	839	11.1
	manufactured fertilisers		*organic manures*	
General cropping	*farms*	*farms %*	*farms*	*farms %*
Computer program	3,821	34.2	1,616	37.9
Farm diary	4,818	43.2	1,723	40.4
Farm notebook/pocketbook	2,401	21.5	695	16.3
File record sheet (file in the office)	2,892	25.9	1,503	35.2
Other paper record	68	0.6	68	1.6
No records kept	406	3.5	0	0.0
	manufactured fertilisers		*organic manures*	
Mixed	*farms*	*farms %*	*farms*	*farms %*
Computer program	2,197	27.1	1,552	29.5
Farm diary	4,028	49.6	2,460	46.8
Farm notebook/pocketbook	1,828	22.5	1,196	22.7
File record sheet (file in the office)	1,866	23.0	1,153	21.9
Other paper record	53	0.6	97	1.8
No records kept	304	3.6	418	7.4
	manufactured fertilisers		*organic manures*	
Other livestock	*farms*	*farms %*	*farms*	*farms %*
Computer program	1,936	7.8	1,418	8.8
Farm diary	15,694	63.2	10,032	62.2
Farm notebook/pocketbook	6,543	26.3	3,685	22.9
File record sheet (file in the office)	2,667	10.7	1,948	12.1
Other paper record	344	1.4	376	2.3
No records kept	4,147	14.3	4,298	21.1
	manufactured fertilisers		*organic manures*	
All farm types	*farms*	*farms %*	*farms*	*farms %*
Computer program	16,466	23.4	7,687	20.0
Farm diary	36,104	51.4	20,401	53.1
Farm notebook/pocketbook	14,798	21.1	7,844	20.4
File record sheet (file in the office)	14,333	20.4	7,840	20.4
Other paper record	792	1.1	644	1.7
No records kept	5,352	7.1	5,555	12.6

Note: more than one method may be used

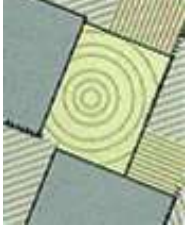
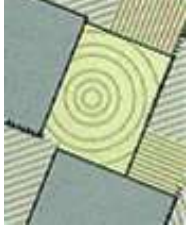


Table D4.2c Record keeping methods percentage (%) of farms, for fertiliser and manure applications on farms where each respective nutrient type was applied in the crop year, Great Britain 2008-2012

		computer program	*farm diary*	*farm notebook/ pocket-book*	*file record sheet (file in the office)*	*other paper record*	*no records kept*
manufactured fertilisers	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	23.4	43.5	22.2	23.8	2.0	5.9
	2012	23.4	51.4	21.1	20.4	1.1	7.1
organic manures	2008	11.7	48.1	27.7	24.7	0.5	12.4
	2009	12.4	52.7	26.1	18.2	3.7	9.3
	2010	17.2	47.9	21.4	23.5	4.9	9.9
	2011	18.9	47.6	19.8	24.9	1.9	8.5
	2012	20.0	53.1	20.4	20.4	1.7	12.6

Note: more than one method may be used

Recording methods for manufactured fertilisers show minor variations across the five year period 2008-12 with farm diaries remaining the most widely used recording method. For organic manures, records of some type were kept on 87-92% 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 2012

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 SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	2.3	2.6	1.2	1.2	1.6	1.4	2.0	2.1	5.1	1.4	1.9	1.9	1693
oilseed rape	2.4	2.6	1.1	1.6	2.0	2.8	2.4	2.4	4.5	2.0	2.6	2.9	557
winter barley	2.3	2.9	1.6	1.7	2.2	1.6	2.2	2.3	4.7	1.9	2.3	2.4	512
spring barley	1.9	2.4	1.9	1.3	1.7	1.2	1.6	2.0	2.1	1.3	1.7	2.0	640
m/c potatoes	8.0	6.0	9.2	8.5	13.8	6.6	7.3	7.0	8.8	7.7	11.6	14.8	110
sugar beet	3.6	4.0	2.2	3.6	6.4	3.4	3.3	3.3	8.9	5.0	5.9	11.8	142
all tillage crops	2.1	2.4	1.1	0.9	1.3	1.0	1.9	2.0	1.9	1.2	1.8	1.6	4585
all grass	1.7	1.5	1.1	0.4	0.5	0.3	1.8	2.5	1.7	0.7	0.9	2.0	3444

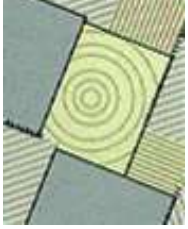
England & Wales

	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 SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	2.4	2.7	1.1	1.2	1.7	1.4	2.1	2.2	5.4	1.5	2.1	1.9	1591
oilseed rape	2.5	2.7	1.0	1.7	2.1	2.9	2.5	2.5	4.6	2.2	2.8	3.0	523
winter barley	2.4	3.0	1.7	1.8	2.2	1.7	2.3	2.4	5.4	2.0	2.5	2.5	466
spring barley	2.4	3.0	2.1	1.4	1.9	1.5	2.1	2.4	2.8	1.9	2.3	2.6	389
m/c potatoes	8.1	6.5	9.8	9.2	15.0	6.2	7.4	7.5	9.4	8.4	12.8	15.0	102
sugar beet	3.6	4.0	2.2	3.6	6.4	3.4	3.3	3.3	8.9	5.0	5.9	11.8	142
all tillage crops	2.3	2.6	1.0	1.0	1.4	1.1	2.1	2.0	2.5	1.5	2.2	1.8	4012
all grass	1.9	1.7	1.2	0.4	0.5	0.3	2.2	2.8	2.0	0.8	1.2	2.8	2758

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 SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	7.2	10.4	8.6	4.3	5.4	5.5	6.4	8.4	12.9	3.7	4.8	6.2	102
oilseed rape	7.8	9.3	8.9	5.7	5.9	11.9	7.8	9.3	13.5	5.3	5.2	14.3	34
winter barley	7.0	9.4	5.9	5.6	6.7	6.0	7.0	7.9	9.0	4.6	5.8	7.2	46
spring barley	2.8	3.7	3.3	2.0	2.7	2.0	2.5	3.5	3.1	1.8	2.5	3.3	251
all potatoes	23.1	11.2	18.0	16.4	25.7	25.4	21.1	11.2	17.1	14.3	21.9	42.8	16
all tillage crops	3.7	4.4	2.9	2.0	2.6	2.0	3.3	4.9	2.8	2.0	2.5	3.1	573
all grass	3.5	2.5	2.9	1.1	1.3	0.5	3.2	4.6	3.1	1.4	1.5	2.1	686

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.

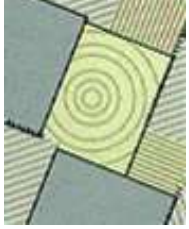
Table App 1.2 Response to main and reserve samples in 2012

	2012	*% total*
Target sample	1500	100
2011 panellists agreeing to re-contact in 2012	1355	90
Achieved 'Main' sample from 2011 panel	1028	69
Achieved additional 'Main' sample	128	9
Achieved '1st reserve' sample	128	9
Achieved '2nd reserve' sample	68	5
Achieved '3rd reserve' sample	57	4
Total achieved	**1409**	**94**
Total number of refusals/non-contact	1225	
Total number of farms approached	***2634***	

Table App 1.3 Response to main and reserve samples for 2007 - 2012

Net response rate	*2008 %*	*2009 %*	*2010 %*	*2011 %*	*2012 %*
Overall achieved rate	88	92	91	95	94
Achieved % of total contact attempts	48	53	48	59	53
Main sample	84	81	83	81	82
Reserve sample(s)	16	19	17	19	18
Main reason for refusal	*2008 %*	*2009 %*	*2010 %*	*2011 %*	*2012 %*
Too busy	18	18	15	20	22
Not interested	9	14	10	13	13
Do not do surveys	3	3	3	4	4
Want payment	1	0	0	0	0
Too much paperwork	0	1	0	1	0
Non contact	43	36	55	40	41
Other [a]	26	27	16	22	20

[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.

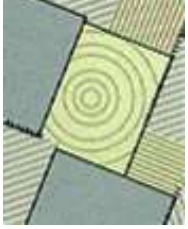


APP 1.3 INFORMATION ON HOLDINGS BELOW 20 HECTARES

Holdings of less than 20 hectares in size are excluded from the BSFP sample. These smaller farms account for a significant proportion of the number of holdings but a much smaller proportion of the area of crops and grass. At Great Britain level, the total number of holdings in the population for 2011 was 198,232. Holdings below 20 hectares accounted for 4% of the total crop area and 10% of the total grass area. Further detailed information for Great Britain is provided in the table below on the equivalent crop or grassland areas and number of holdings for those holdings where the total size of the farm is below 20 hectares.

2011	Total area (ha)	Total no. holdings area>0	Area (ha) <20ha	No. of holdings with <20ha	Proportion of area <20ha	Proportion of holdings <20ha	No. of holdings with zero area	Total no. holdings
Total croppable area	5,920,7272	91,274	247,986	41,364	4%	45%	106,958	198,232
of which crops	4,618,946	64,823	191,386	26,705	4%	41%	133,409	198,232
of which temporary grass< 5 years old	1,148,128	57,323	255,428	39,864	22%	70%	140,909	198,232
Total grass	6,377,728	161,418	620,211	86,695	10%	54%	36,814	198,232
grass < 5 years old	1,148,128	57,323	255,428	39,864	22%	70%	140,909	198,232
grass ≥ 5 years old	5,229,600	151,226	621,400	88,075	12%	57%	45,006	198,232

Note: Includes bare fallow and uncropped land.

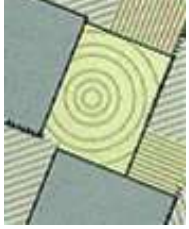


APPENDIX 2

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.