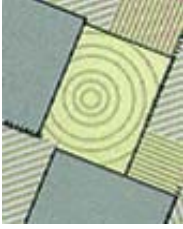


THE BRITISH SURVEY OF  
**Fertiliser  
Practice**

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FERTILISER USE ON FARM CROPS  
FOR CROP YEAR 2014



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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 2014 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 2014, 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 in 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](#), [agriculture and climate change](#), [NVZs](#) and [soil nutrient balances](#) 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.

### Other information

Defra also run other surveys which may be of relevance to fertiliser use and related practices through its Farm Practices Survey for England, which is available on the Defra website.

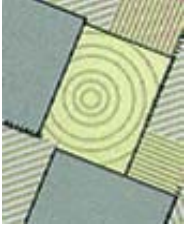
### Contact information and feedback

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 2014.

April 2015



## ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2014 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).

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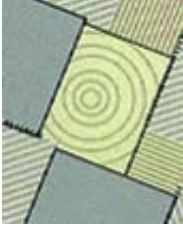
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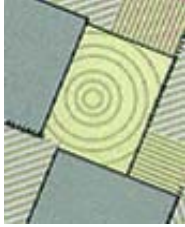
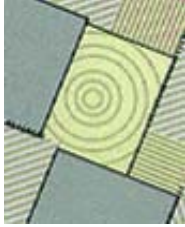


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## EXECUTIVE SUMMARY

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 2014 Survey on the use of the nutrients nitrogen, phosphorus, potassium and sulphur in Great Britain are summarised below (Table ES1).

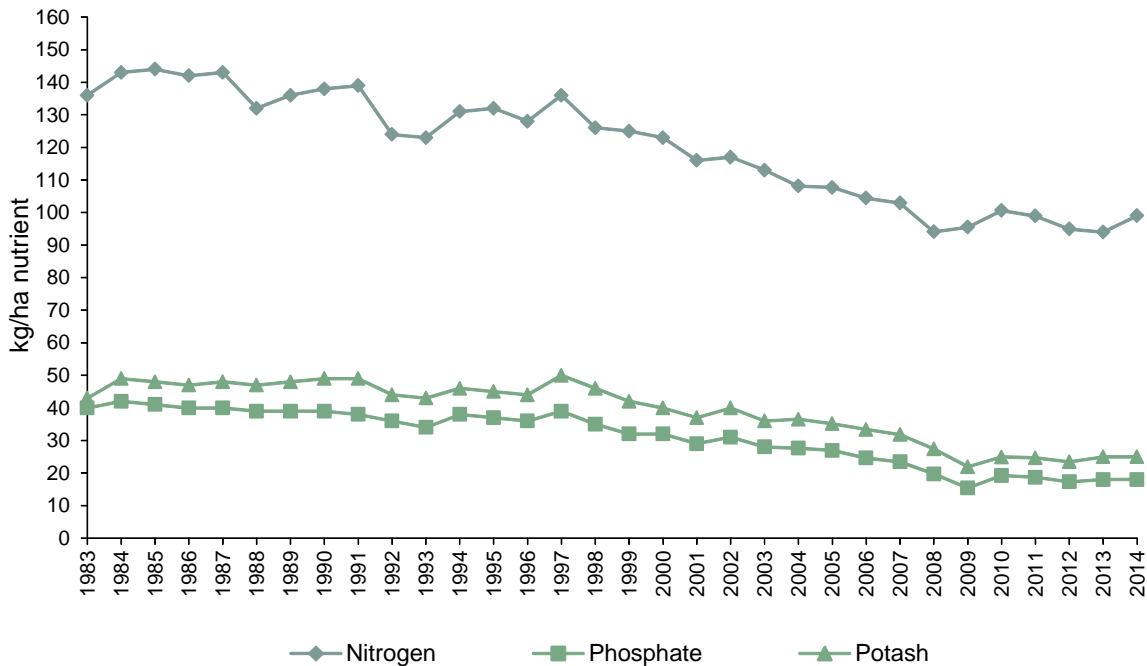
The weather was a major influence on fertiliser use in the 2013 crop year. A very wet 2012 autumn made drilling difficult and impacted on survival of crops through the winter and a swing to spring grown crops, which often require less fertiliser. The 2014 crop year was more typical in terms of the weather and saw a return to a more usual balance of winter and spring sown crops. There was an overall 1.3% decrease in the total area of tillage crops planted and the area of winter wheat and winter barley increased significantly. The weather is discussed more fully in Section A3.1 with a more detailed overview of the data in Section B and crop level information summarised in tables GB1.1-1.3 of Section C.

**Table ES1 Nutrient dressing cover, current and five year mean overall application rates for all crops and grass, Great Britain 2014**

	All Tillage	All Grass	All Crops and Grass
<b>Total Nitrogen - N</b>			
Overall application rate, 2014 (kg/ha)	146	60	99
Mean overall application rate, 2010-2014 (kg/ha)	143	59	97
Crop area receiving dressing, 2014 (%)	92	62	76
Average field rate, 2014 (kg/ha)	158	96	130
<b>Total Phosphate - P<sub>2</sub>O<sub>5</sub></b>			
Overall application rate, 2014 (kg/ha)	29	10	18
Mean overall application rate, 2010-2014 (kg/ha)	29	9	18
Crop area receiving dressing, 2014 (%)	49	41	45
Average field rate, 2014 (kg/ha)	59	24	41
<b>Total Potash - K<sub>2</sub>O</b>			
Overall application rate, 2014 (kg/ha)	39	14	25
Mean overall application rate, 2010-2014 (kg/ha)	39	13	25
Crop area receiving dressing, 2014 (%)	50	43	46
Average field rate, 2014 (kg/ha)	78	32	55
<b>Total Sulphur - SO<sub>3</sub></b>			
Overall application rate, 2014 (kg/ha)	31	4	16
Mean overall application rate, 2010-2014 (kg/ha)	27	2	14
Crop area receiving dressing, 2014 (%)	51	11	29
Average field rate, 2014 (kg/ha)	60	33	54



Figure ES1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2014

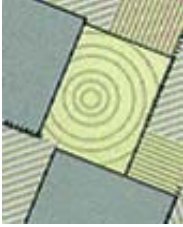


## Nitrogen

- 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 so supplementary nitrogen applications have to be made each year.
- The 5 kg/ha increase in total nitrogen use on all crops and grassland in 2014 resulted from a large, 10 kg/ha increase in the overall rates on tillage crops to 146 kg/ha. This is a return to the typical 145-150 kg/ha range which has been observed for the majority of the 30 years of the survey. It is likely that the reversal of the 2013 swing to spring cropping was a major factor in this. The previous lows for 2008 and 2009 were attributed mainly to the high fertiliser prices.
- 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.
- Overall application rates of nitrogen on winter cereals increased by 2 kg/ha from 2013. The overall nitrogen rate on spring barley decreased by 2 kg/ha to 106 kg/ha, with the 2013 rate being the highest recorded since 2002. Total nitrogen on oilseed rape increased by 14 kg/ha in 2014, and this is mainly attributable to an increase in the proportion of winter sown oilseed rape.

## Phosphate and potash

- Phosphate and potash are applied in fertilisers and manures, particularly to replace the quantities removed in harvested crops. Most British soils can hold large quantities of these nutrients for crop uptake over several years. Consequently the timing of maintenance application tends to be less time critical compared to nitrogen or sulphur. This may help to explain the trend seen for overall declining dressing cover on combinable crops, especially in England.
- The overall application rates in 2009 for both phosphate and potash were the lowest recorded since this dataset began in 1983. Overall rates of phosphate and potash applied to tillage crops are about three times those used on grassland. However there is greater use of applied manures on grassland (32% cover) than on tillage crops (22% cover) and grazed grassland also receives manure as it is grazed.



- Overall phosphate use on tillage crops declined gradually between 1984 and 1996. Thereafter the decline in rates became more marked, with an overall rate of 29 kg/ha in 2014. This is the third lowest rate since Great Britain records began. The overall rate of phosphate on grassland was highest in 1983, at 28 kg/ha, and remained relatively stable between 1984 and 1998. Overall application rates have declined more rapidly in the period since 1999, and in 2014 stabilised at 10 kg/ha.
- Overall potash application rates on tillage crops declined slightly between 1983 and 1997, with the rates in the 60-68 kg/ha range. Like phosphate, overall application rates reduced at a greater rate after this time, dropping to their lowest levels of 33 kg/ha in 2009 when fertiliser prices were high. Between 2010 and 2014 overall potash application rates have been in the range 37-40 kg/ha.
- Whilst the pattern of use of potash on grassland has been more variable, this has also shown a net decline between 1983 and 2014. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline and have been in the range 12-14 kg/ha since 2008.
- It is of note that in Scotland the phosphate and potash application rates on tillage land have largely been maintained, relative to the decline seen in England.

## 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; with crops such as oilseed rape are particularly sensitive to sulphur deficiency. 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<sub>3</sub>) 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 2014 cereals sulphur dressing covers were in the 47%-57% range. The 76% dressing cover for winter oilseed rape was a 4% increase from 2013.
- In 2014, 29% of all crops and grass received a dressing of sulphur, this figure was 51% for tillage crops. On tillage crops the overall application rate for sulphur was 31 kg/ha, a increase of 4 kg/ha in comparison to last year. Applications on grass also increased in 2014 to 4 kg/ha, this low overall rate is caused by the low dressing cover, with only 11% of grass receiving a sulphur dressing.

## Organic manures

- Historically, the Survey has focussed on the application of manufactured fertilisers although in recent years it has also collected information on the use and movement of organic manures. The nutrient levels in organic manures vary according to the type of manure but provide a valuable source of nitrogen, phosphorus and potassium. Where used, applications of manufactured fertiliser can usually be reduced.
- In 2014, around 66% of farms in the survey used organic manures on at least one field on the farm. Cattle manure from beef and dairy farms is by far the largest volume of manure type generated in Great Britain. The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure on the farm on which it is produced.
- Fields of winter sown crops are primarily treated in August and September, prior to drilling, whereas spring sown and grass fields are predominantly treated between November and April.



# 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 B2.6. 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 plus information on timing of applications. 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. Section E contains more general information on farm practices such as spreader checking, record keeping and nutrient management plans. 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.<sup>2, 3, 4, 5</sup>

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.

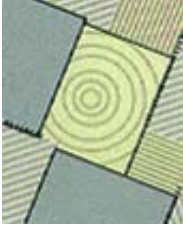
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<sup>2</sup> Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

<sup>3</sup> 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.

<sup>4</sup> 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.

<sup>5</sup> 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 A2.7 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 1,363 holdings in 2014, which is consistent with the previous year. 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 2014, 70% of the sample had responded in the previous year. The profile of the panel in terms of farm size was 71% >200ha, 71% 100-200ha, 69% 50-100 ha and 63% >20-50 ha.

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 methodology (Appendix 1).

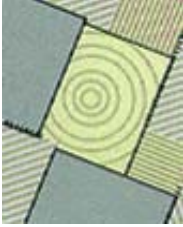
**Table A2.1 Derivation of the stratified random sample for the 2014 survey, England & Wales**

	farm holdings in population in 2013	total crops and grass in 2013 (column %)	notional sampling fraction <sup>a</sup> (%)	target sample size	achieved sample size	achieved sample fraction <sup>b</sup> (%)
<b>England &amp; Wales</b>						
<b>Livestock &amp; mixed</b>						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
<b>crops &amp; grass area</b>						
20-50 ha	18,357	7.2	0.48	88	83	0.45
51-100 ha	16,297	13.7	1.03	168	151	0.93
101-200 ha	11,105	17.8	1.98	220	193	1.74
200+ ha	4,536	17.8	4.85	220	232	5.11
<b>Total livestock &amp; mixed</b>	50,295	56.5	1.39	697	659	1.31
<b>Crops</b>						
(Robust types: cereals, general cropping)						
<b>crops &amp; grass area</b>						
20-50 ha	6,910	2.7	0.48	33	27	0.39
51-100 ha	6,119	5.2	1.04	64	51	0.83
101-200 ha	5,923	9.9	2.06	122	90	1.52
200+ ha	5,340	24.3	5.61	300	268	5.02
<b>Total crops</b>	24,292	42.0	2.13	518	436	1.79
<b>Horticulture</b>						
(Robust type: horticulture)						
<b>crops &amp; grass area</b>						
20-50 ha	697	0.3	0.88	6	6	0.86
51-100 ha	371	0.3	1.97	7	7	1.89
101-200 ha	205	0.3	3.92	8	7	3.41
200+ ha	112	0.6	12.05	13	7	6.25
<b>Total horticulture</b>	1,385	1.4	2.53	35	27	1.95
<b>Total for England &amp; Wales</b>	75,972	100		1,250	1,122	1.48

<sup>a</sup> The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2013*

<sup>b</sup> The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2013*





**Table A2.2 Derivation of the stratified random sample for the 2014 survey, Scotland**

	farm holdings in population in 2013	total crops and grass in 2013 (column %)	notional sampling fraction <sup>a</sup> (%)	target sample size	achieved sample size	achieved sample fraction <sup>b</sup> (%)
<b>Scotland</b>						
<b>Cereal/general</b>						
(Robust types: cereals, general cropping, horticulture)						
<b>crops &amp; grass area</b>						
20-50 ha	738	1.4	0.47	3	4	0.54
51-100 ha	874	3.6	1.03	9	7	0.80
101-200 ha	839	6.8	2.02	17	16	1.91
200+ ha	430	7.8	4.51	19	19	4.42
<b>Total cereal/general</b>	<b>2,881</b>	<b>19.5</b>	<b>1.69</b>	<b>49</b>	<b>46</b>	<b>1.60</b>
<b>Livestock &amp; mixed</b>						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed, general cropping; forage)						
<b>crops &amp; grass area</b>						
20-50 ha	4,962	9.2	0.29	15	22	0.44
51-100 ha	4,101	16.7	0.79	32	41	1.00
101-200 ha	3,237	25.3	1.66	54	60	1.85
200+ ha	1,559	29.3	3.75	59	72	4.62
<b>Total livestock &amp; mixed</b>	<b>13,859</b>	<b>80.5</b>	<b>1.15</b>	<b>159</b>	<b>195</b>	<b>1.41</b>
<b>Total for Scotland</b>	<b>16,740</b>	<b>100</b>		<b>208</b>	<b>241</b>	<b>1.44</b>

## A2.2 DATA COLLECTION

Data collection was undertaken between June and October 2014 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 B2.6. 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 A2.5.

## A2.3 DATA QUALITY ASSURANCE

Experienced and knowledgeable field staff are used to collect the required information. They make use of information from a variety of different records kept by farmers. Farm diaries are the most common method used on farm. Further information is provided in Section E. 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.

<sup>a</sup> The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2013*

<sup>b</sup> The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2013*





## 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 52% was achieved in 2014, which was a 1% increase from 2013. 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.

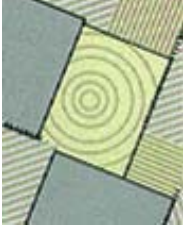
The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 9.2 million hectares in England and Wales and about 1.9 million hectares in Scotland. The estimates of the average 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 overall application rate takes into account both the average field rate and the proportion of the crop area treated, giving an overview of the crop as a whole. The definitions of the terms used are set out in Section A2.7 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 B2.6. 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.

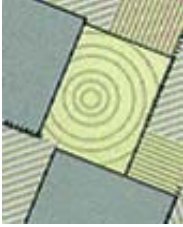
The overall application rates for all nutrients have been corrected in Table SC1.3 in Section C.



## 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 2013 to autumn 2014, corresponding to the 2014 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 2013. 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 or 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<sub>2</sub>O<sub>5</sub>** for phosphate; **K<sub>2</sub>O** for potash, **SO<sub>3</sub>** 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. Rates are expressed in terms of the equivalent nutrient content, taking into account the nutrient content in the product used. The nutrient content of the common fertiliser products including the dry matter content and nutrient content of various organic manures used are given in the Fertiliser Manual, RB 209 which is available on the Defra website.
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>

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

<i>table number</i>	<i>robust group in table title</i>	<i>robust type name</i>	<i>robust number</i>
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 E1.2b. 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 2014. 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 mineral 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 fertilisers, 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.

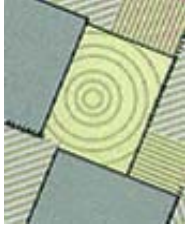
**Phosphorus** is essential for photosynthesis and respiration. It promotes early root formation and growth and enhances seed and fruit production. It is also important for energy production and storage. In the context of fertilisers it is measured and defined as  $P_2O_5$ . Phosphate fertilisers include 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 as 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 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 2012/13 and 2013/14, 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 2014, of which 4.6 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 uncropped. In this report, as was the case in for the last 8 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, 2013 – 2014**

Crops	June 2013 '000s ha	June 2014 '000s ha	% change since 2013	% change since 2009	2014 crop areas as % of total tillage area
Wheat	1607	1928	20.0	9.2	41.4
Barley – winter	305	422	38.4	6.0	9.1
– spring	883	634	-28.2	-11.7	13.6
<i>Total cereals<sup>1</sup></i>	<i>2992</i>	<i>3144</i>	<i>5.1</i>	<i>3.5</i>	<i>67.5</i>
Oilseed rape – total	714	675	-5.5	18.6	14.5
Oilseed rape – winter	620	660	6.5	26.2	14.2
Oilseed rape – spring	95	15	-84.2	-67.4	0.3
Sugar beet	117	116	-0.9	1.8	2.5
Potatoes <sup>2</sup>	134	136	1.5	-2.2	2.9
Linseed	34	15	-55.9	-46.4	0.3
Peas/beans <sup>3</sup>	146	137	-6.2	-39.9	2.9
Maize/other fodder	276	255	-7.6	11.8	5.4
Vegetables	146	146	0	17.7	3.1
<i>Total tillage<sup>4</sup></i>	<i>4599</i>	<i>4661</i>	<i>1.3</i>	<i>2.5</i>	<i>100.0</i>
Set-aside and bare fallow <sup>5</sup>	254	159	-37.4	-34.8	
<b>Grassland</b>					2014 grass areas as % of total grass area
Less than 5 years old	1251	1249	-0.2	11.5	19.4
5 years and older	5153	5182	0.6	-0.3	80.6
<i>Total grass<sup>6</sup></i>	<i>6404</i>	<i>6431</i>	<i>0.4</i>	<i>1.8</i>	<i>100.0</i>
<i>Total crops and grass<sup>7</sup></i>	<i>11002</i>	<i>11092</i>	<i>0.8</i>	<i>2.1</i>	

<sup>1</sup> including minor cereals (oats, rye, triticale, mixed corn).

<sup>2</sup> early + maincrop potatoes.

<sup>3</sup> harvested dry for animal consumption or, for peas, human consumption.

<sup>4</sup> including other crops, but not bare fallow or set-aside.

<sup>5</sup> the obligatory set-aside rate for the 2013 and 2014 Single Payment Years was set at 0%.

<sup>6</sup> managed grassland, excluding rough grazing.

<sup>7</sup> total tillage + total grassland.

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



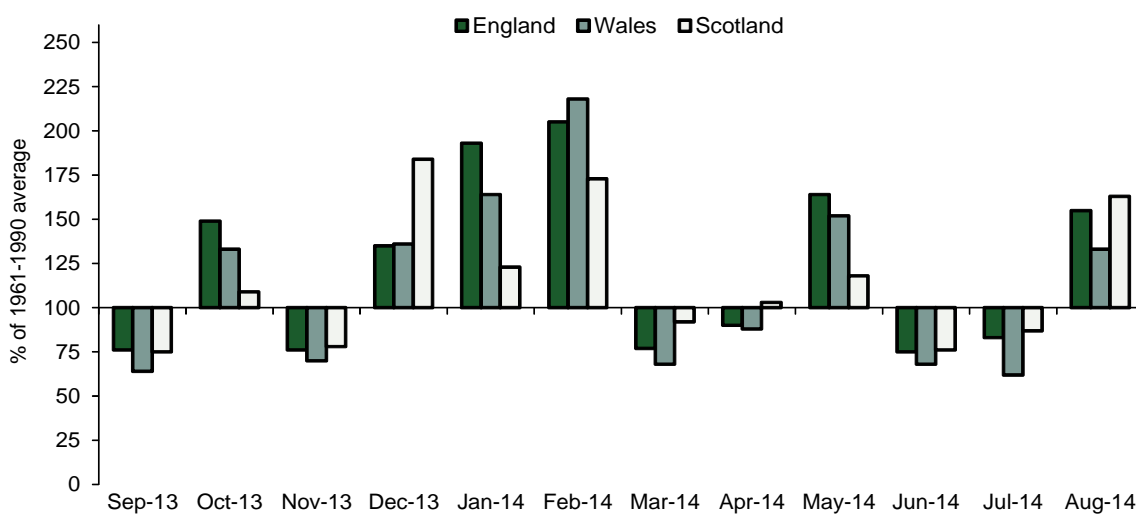
Comparing the 2013 and 2014 cropping years, the most marked change was the increase in the area of winter cereals and winter oilseed rape. Drillings of these crops were markedly affected by the poor weather conditions experienced in the autumn of 2012, so this most recent change could be described as a return to a more normal pattern of cropping. Winter sown crops increased in general, with winter barley up by 38% over 2013. The total area under tillage crops increased by 1.3% in 2014, whilst the total area of uncropped land (bare fallow and set-aside) decreased by 37.4% in 2014. This was predominantly caused by an decrease in land left as bare fallow in England, with the obligatory set aside area remaining at zero in all three countries.

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

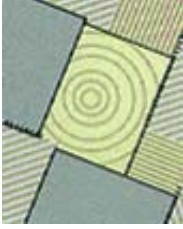
- A very wet (or very dry) autumn might delay the establishment of winter sown crops, or alter the ratio of winter to spring sown crops, with their different fertiliser requirements.
- Prolonged wet weather can increase leached losses of some nutrients, particularly nitrogen and sulphur. Weather conditions 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 2013 there was a north/south contrast in rainfall patterns with Scotland drier than average (1981-2010), whereas parts of southern and central England were wetter. October was a wet month except for northern Scotland, with England having the wettest October since 2000. The winter of 2013/14 was exceptionally stormy with persistent heavy rainfall making it the wettest winter since 1910. Rainfall totals in December exceeded twice the monthly average in much of south east England and Scotland. The wet theme continued in January and February which was the third wettest in the series. The weather of spring 2014 was much more benign with a mix of settled and wet spells. May was wetter than average for most areas particularly north east England. The summer saw several spells of fine settled weather in both June and July. That, and a cool, wet August resulted in statistics that were close to the average. In August parts of England and much of northern Scotland received twice the average monthly rainfall. Northern Scotland had the wettest August on record since 1910. The timing of fertiliser applications returned to a more normal pattern in this cropping year, having been delayed in March 2013 by the cold conditions at that time (Table GB3.0).

**Figure A3.1 Monthly rainfall as a % of the long term average<sup>6</sup>**



<sup>6</sup> [www.metoffice.gov.uk/climate/uk](http://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 2010-14. 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 2013-14 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 overall application rate takes into account both the average field rate and the proportion of the crop area treated, giving an overview of the crop as a whole. 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 9.6 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<sup>7</sup> and historic data for the key data series are also available on the Defra web site.

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<sup>7</sup> 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.



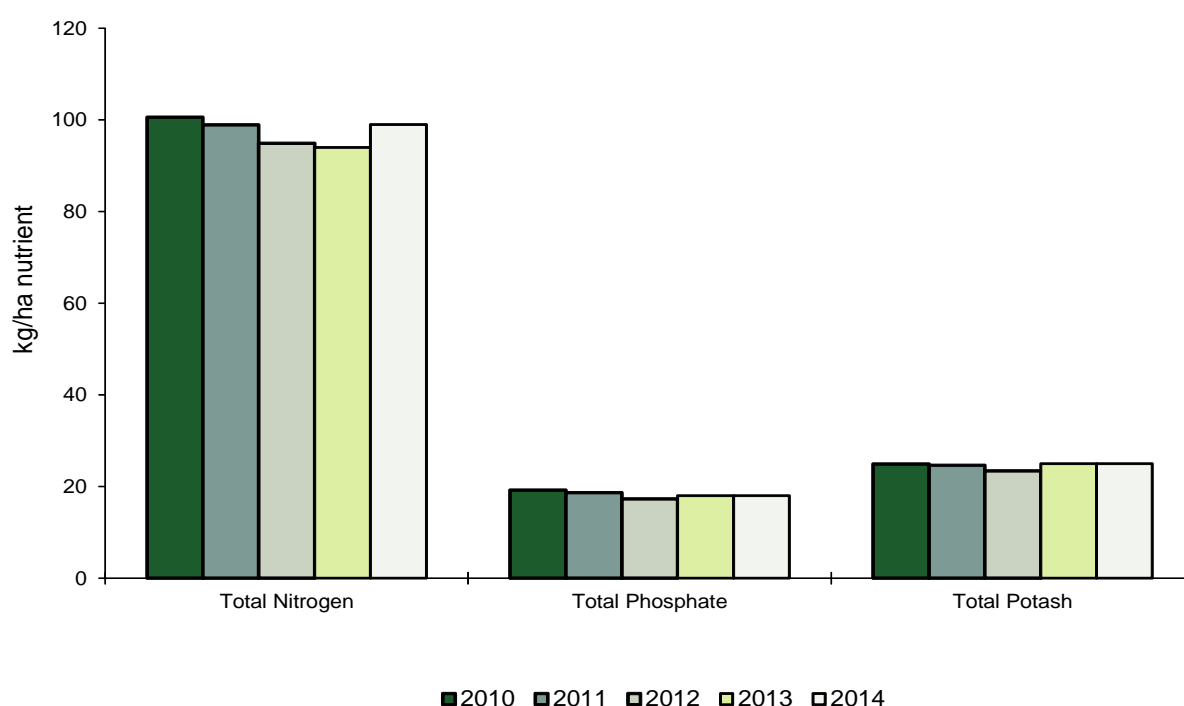


## B1 2014 RESULTS FOR GREAT BRITAIN AND CHANGES IN RECENT YEARS

### 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 2014 overall rate for all crops and grass is 99 kg/ha, an increase of 5 kgs/ha from 2013. Overall rates for phosphate and potash declined until 2009, then stabilised, and were unchanged in 2014 at 18 kg/ha and 25 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 2010 - 2014**



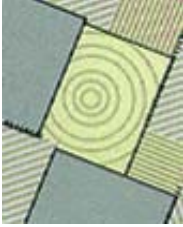
#### B1.1.1 Nitrogen

##### All crops and grassland

**Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2010 – 2014**

##### Total nitrogen

	<i>tillage crops</i>	<i>grass</i>	<i>all crops and grass</i>
2010	145	63	101
2011	146	57	99
2012	144	55	95
2013	136	59	94
2014	146	60	99



### Straight nitrogen

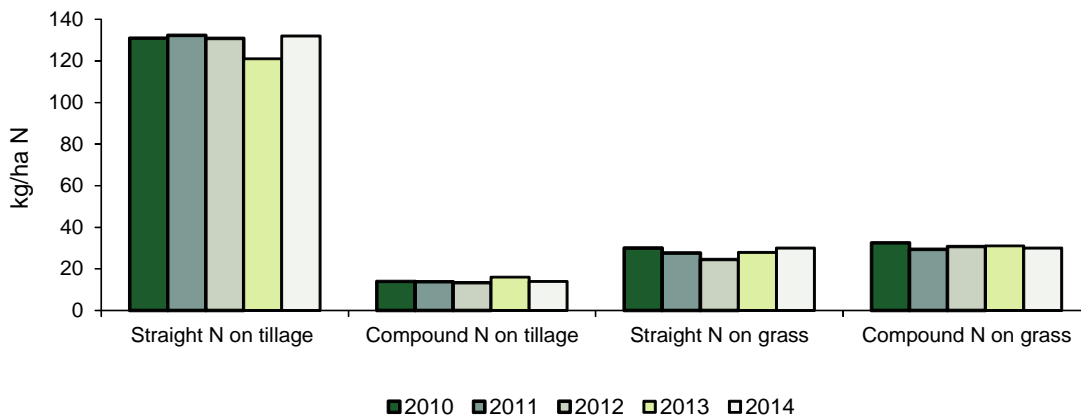
	<i>tillage crops</i>	<i>grass</i>	<i>all crops and grass</i>
2010	131	30	77
2011	132	28	77
2012	131	25	72
2013	121	28	69
2014	132	30	76

### Compound nitrogen

	<i>tillage crops</i>	<i>grass</i>	<i>all crops and grass</i>
2010	14	33	24
2011	14	29	22
2012	13	31	23
2013	16	31	24
2014	14	30	23

The 5 kg/ha increase in total nitrogen use on all crops and grassland (Figure B1.1) was caused by a large increase in the overall rates on tillage crops. It is likely that partially failed and generally poor tillage crops, caused the relatively low rate in 2013. All tillage also included an increased proportion of winter crops in 2014 where nitrogen rates are higher. On grass the overall application rates increased for straight N by 2 kg/ha, whilst compound N reduced by 1 kg/ha to 30 kg/ha. On tillage crops the rate of straight N recovered to 132 kg/ha whilst the rate of compound N reduced by 2 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 2010-14.

**Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2010 – 2014**



### 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 at 84% in 2014, an increase of 1% from 2013. The increase in the overall application rate was therefore caused by the 12 kg/ha increase to the average field rate, which was 157 kg/ha in 2014.

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



## Grassland

In 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 1 kg/ha increase to the overall N application rate in 2014 was due to changes in the average field rates as the proportion of the grass area receiving a dressing of straight N and compound N were largely unchanged. The average field rate of straight N increased by 4 kg/ha to 104 kg/ha, whilst the compound N average field rate decreased by 2 kg/ha to 72 kg/ha.

### B1.1.2 Phosphate, Potash and Sulphur

#### Phosphate

Table B1.2a 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 2014 phosphate rate on tillage was slightly higher in 2014 at 29 kg/ha, with a slightly increased proportion receiving a dressing (49%) and an unchanged average field rate (59 kg/ha). For grassland the overall rate has been more stable, and 2014 saw a 1% decrease in dressing cover and a slight increase in the average field rate to of 24 kg/ha. The five year means for overall phosphate rates for tillage crops and grass were 29 and 9 kg/ha respectively.

**Table B1.2a Overall phosphate and potash use (kg/ha), Great Britain 2010 – 2014**

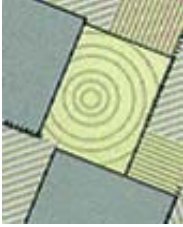
	Total phosphate			Total potash			
	tillage crops	grass	all crops and grass	tillage crops	grass	all crops and grass	
2010	30	10	19	2010	38	14	25
2011	29	9	19	2011	39	12	25
2012	28	9	17	2012	37	12	23
2013	28	9	18	2013	40	13	25
2014	29	10	18	2014	39	14	25

#### Potash

As with phosphate, overall potash use in 2009 fell to the lowest ever recorded by the Survey on tillage crops (33 kg/ha) and grassland (12 kg/ha) alike. By 2014 the overall potash rate had increased to 39 kg/ha on tillage crops, and on grassland the overall rate increased by 1 kg/ha to 14 kg/ha. On tillage crops the proportion of the area receiving a dressing of potash decreased by 1% to 50%, whilst the average field rate unchanged at 78 kg/ha. On grass dressing cover was unchanged at 43% and the average field rate increased slightly to 32 kg/ha.

#### Sulphur

Table B1.2b shows overall sulphur applications for the past five years. The overall rate on tillage crops has varied between 23 and 31 kg/ha over the period, with the highest rate recorded in 2014. The proportion of the tillage area receiving a sulphur dressing was also at its highest over the five year period at 51% in 2014. The average field rate on tillage crops was also the highest over the five years at 60 kg/ha. The overall rate of sulphur on grass has been more stable; albeit with a 2 kg/ha increase between 2013 and 2014. The low overall rate of sulphur on grass is caused by lower dressing cover percentages and lower average field rates on grass than on tillage crops.



**Table B1.2b Overall sulphur use (kg/ha), Great Britain 2010 – 2014**

**Total sulphur**

	<i>tillage crops</i>	<i>grass</i>	<i>all crops and grass</i>
2010	23	2	12
2011	26	2	13
2012	29	2	14
2013	27	2	13
2014	31	4	16

## **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 B1.3a and B1.3b. Dressing cover percentages for the same period are shown in Table B1.4. More detailed statistics for 2014 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.



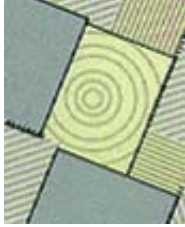
**Table B1.3a Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2010 – 2014**

<b>Total nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	188	97	140	132	192	86
2011	188	99	138	158	192	86
2012	184	99	143	135	186	95
2013	183	108	142	173	177	94
2014	185	106	144	141	191	96
<b>Straight nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	180	63	125	33	185	80
2011	181	67	126	48	184	78
2012	177	63	133	43	179	88
2013	177	77	130	56	169	87
2014	179	70	134	62	186	85
<b>Compound nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	8	34	15	99	7	7
2011	7	32	12	110	8	8
2012	7	37	10	92	7	7
2013	7	31	12	116	8	7
2014	6	36	10	79	5	10
<b>Total phosphate</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	27	35	33	118	29	28
2011	28	34	30	114	26	26
2012	25	34	30	103	25	23
2013	26	31	27	121	27	24
2014	27	35	31	91	26	21
<b>Total potash</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	31	46	47	200	29	78
2011	33	45	46	197	27	76
2012	31	47	41	192	27	70
2013	32	46	41	225	28	74
2014	35	46	44	173	27	69
<b>Total sulphur</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a,c</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	22	17	21		54	13
2011	25	16	21		61	13
2012	28	17	25		63	12
2013	29	19	27		59	27
2014	32	21	28		63	26

<sup>a</sup> Figures for maincrop potatoes include second earlies.

<sup>b</sup> Single crop grouping for the combined winter and spring oilseed rape areas.

<sup>c</sup> 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 B1.3b Average field rates (kg/ha) on major tillage crops, Great Britain 2010 – 2014**

<b>Total nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	190	102	142	135	193	91
2011	190	103	139	164	192	90
2012	187	104	144	142	186	98
2013	186	110	145	179	178	96
2014	188	110	146	151	192	97
<b>Straight nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	187	91	133	78	189	87
2011	187	90	134	87	186	85
2012	184	86	140	81	181	96
2013	182	95	139	99	170	93
2014	186	94	141	106	187	90
<b>Compound nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	62	59	62	123	43	60
2011	68	59	66	130	38	75
2012	72	61	65	128	39	50
2013	61	64	67	149	37	48
2014	63	67	57	119	28	48
<b>Total phosphate</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	60	49	55	135	60	57
2011	62	51	53	129	59	59
2012	61	48	57	134	57	59
2013	62	50	55	143	60	61
2014	59	53	58	120	59	61
<b>Total potash</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	72	64	73	226	67	111
2011	75	65	73	218	65	111
2012	77	63	72	247	68	110
2013	74	67	73	255	68	110
2014	74	68	74	226	69	104
<b>Total sulphur</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a,c</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	54	40	48		85	50
2011	55	39	45		86	56
2012	54	39	50		86	59
2013	55	43	54		82	65
2014	57	45	50		82	57

<sup>a</sup> Figures for maincrop potatoes include second earlies.

<sup>b</sup> Single crop grouping for the combined winter and spring oilseed rape areas.

<sup>c</sup> 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.

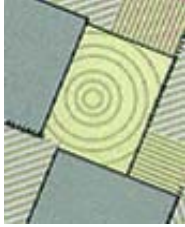


**Table B1.4 Dressing cover (% area) on major tillage crops, Great Britain 2010 – 2014**

<b>Total nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	99	95	98	98	100	95
2011	99	96	99	96	100	96
2012	99	96	99	95	100	97
2013	99	98	98	97	99	99
2014	98	97	99	93	100	98
<b>Straight nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	97	69	94	43	98	92
2011	97	74	94	55	99	91
2012	96	73	95	53	99	92
2013	97	81	94	57	99	94
2014	96	75	95	58	99	95
<b>Compound nitrogen</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	13	57	24	80	17	11
2011	10	55	19	85	20	11
2012	10	60	16	72	17	13
2013	11	48	18	78	21	16
2014	10	54	18	66	16	21
<b>Total phosphate</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	45	70	59	87	48	50
2011	46	67	57	88	45	43
2012	41	70	53	76	43	40
2013	43	63	49	84	45	40
2014	45	67	53	76	45	34
<b>Total potash</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	42	73	64	88	44	70
2011	44	70	62	90	41	68
2012	40	74	57	78	40	64
2013	43	68	57	88	41	67
2014	46	68	60	77	39	67
<b>Total sulphur</b>	<i>winter wheat</i>	<i>spring barley</i>	<i>winter barley</i>	<i>maincrop potatoes<sup>a</sup></i>	<i>oilseed rape<sup>b</sup></i>	<i>sugar beet</i>
2010	42	42	44	18	64	26
2011	46	40	46	25	70	23
2012	52	45	51	31	73	21
2013	53	43	50	26	72	42
2014	57	47	57	17	76	45

<sup>a</sup> Figures for maincrop potatoes include second earlies.

<sup>b</sup> Single crop grouping for the combined winter and spring oilseed rape areas.



## B1.2.1 Nitrogen

Overall rates of total nitrogen (Table B1.3a) increased between 2013 and 2014 for all the major tillage crops except potatoes and spring barley. The overall rate of total nitrogen on oilseed rape increased by 14 kg/ha. The return to a lower proportion of spring oilseed rape which requires less nitrogen would result in an overall higher rate on all oilseed rape. Average field rates (Table B1.3b), which are unaffected by changes in dressing cover, followed a similar pattern; the rate on spring barley was unchanged at 110 kg/ha. Rates for potatoes are more variable; the standard error for total nitrogen for the average field rate was 7.8 (see Appendix 1.1 for details).

### 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 2010 – 2014**

#### Total nitrogen

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>	
	<i>milling</i>	<i>non-milling</i>	<i>malting</i>	<i>non-malting</i>	<i>malting</i>	<i>non-malting</i>
2010	212	179	106	96	127	149
2011	212	180	107	97	129	144
2012	217	176	110	93	129	152
2013	208	177	110	110	131	151
2014	208	182	112	106	140	147

Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice<sup>11</sup>. 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 potentially 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 average field application rate on milling wheat in 2014 was unchanged and just 2 kg/ha higher than the recent low rate recorded in 2009. The non-milling crop continues to dominate the wheat crop area (Table B1.6) with only 25% of the crop area in 2014 being grown as milling wheat (5 year mean: 30%).

**Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2010 – 2014, as estimated from the Survey**

	<i>winter wheat</i>		<i>spring barley</i>		<i>winter barley</i>	
	<i>milling</i>	<i>non-milling</i>	<i>malting</i>	<i>non-malting</i>	<i>malting</i>	<i>non-malting</i>
2010	35	65	61	39	29	71
2011	33	67	62	38	34	66
2012	27	73	63	37	32	68
2013	30	70	51	49	29	71
2014	25	75	57	43	36	64

<sup>11</sup> Anon. (2010). *Fertiliser Manual (RB209)*, Defra, 8<sup>th</sup> 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 decreased by 2 kg/ha in 2014 to 106 kg/ha. The 2013 rate was the highest reported rate since 2002, and including the 2014 rate increased the 5 year mean to 102 kg/ha. The overall application rate of straight nitrogen decreased to 70 kg/ha, whilst the overall application rate for compound N increased to 36 kg/ha. The overall decrease was caused by an decreased percentage of the spring barley area receiving a dressing of straight N (75% in 2014 compared to 81% in 2013, shown in table B1.4). The average field rate for total nitrogen was 110 kg/ha in 2014, well above the five year average of 106 kg/ha.

Further analysis of the data by crop type (Table B1.5) shows the average rate applied to the spring malting crop increased by 2 kg/ha in 2014 to 112 kg/ha. For non-malting crops the nitrogen application rate decreased to 106 kg/ha, with a five year mean of 100 kg/ha.

Estimated nitrogen rates on spring barley crops has been consistently slightly higher on malting than non-malting crops, with a mean difference of 9 kg/ha over the last five years. This slightly higher use of nitrogen on malting than non-malting crops may seem anomalous, since lower rates of nitrogen are recommended for malting barley, under the same conditions of soil type and nitrogen fertility level, than for the feed varieties of barley. This recommendation is made to avoid the risk of high grain nitrogen content, which could 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)<sup>12</sup>. 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. In 2013 the average field rate of nitrogen was the same on malting and non malting crops, which was unusual, with the difference in rates in 2014 showing a return to more normal practice.

The proportion of spring barley grown for malting has fluctuated during the last five years (Table B1.6). The mean for the period 2010-14 is 59%, but increased from the low proportion in 2013 to 57% in 2014.

## 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 albeit with some fluctuations to 144 kg/ha in 2014. The straight nitrogen rate increased by 4 kg/ha whereas the compound nitrogen rate decreased by 2 kg/ha in 2014.

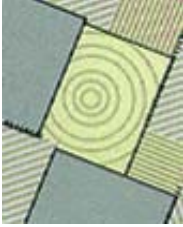
Nitrogen requirements for winter barley, as with the spring sown crop, depend on a range of agronomic factors, including the intended market for the grain. Average field rates of nitrogen on malting crops increased by 9 kg/ha to 140 kg/ha in 2014 giving a five year mean of 131 kg/ha. For non malting crops the average field rate decreased by 4 kg/ha to 147 kg/ha in 2014 (Table B1.5), with the 5 year average being 149 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, and the gap between malting and non malting crops was comparable with 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 36% in 2014, which was more than in the recent past, with the five year mean calculated as 32%. (Table B1.6).

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<sup>12</sup> Anon. (2010). *Fertiliser Manual (RB209)*, Defra, 8<sup>th</sup> edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site



## 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 2014 the overall rate was 141 kg/ha, below the five year mean of 148 kg/ha. (Table B1.3a). The decrease in 2014 is due to decreases in the dressing cover percentage and average field rate of compound nitrogen (Table B1.3b, B1.4), compared to the previous year (66% and 78%) and (119 kg/ha and 149 kg/ha in 2013).

## Oilseed rape

In 2014, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, increased by 14 kg/ha to 191 kg/ha (five year mean 188 kg/ha). This marked increase is a recovery from the low rate observed in 2013, when more spring oilseed rape was planted, due to poor weather conditions in the autumn.

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 increased by 4 kg/ha between 2013 and 2014 to 192 kg/ha. The rate for the spring crop increased by 33 kg/ha to 154 kg/ha. In a normal year spring oilseed rape represents only about 2% of the total oilseed rape area, so the average field rate for total nitrogen on these spring-sown crops should be treated with extreme caution.

**Table B1.7 Average field application rates of nitrogen (kg/ha) on winter and spring oilseed rape, Great Britain 2010 – 2014**

### Total nitrogen (kg/ha)

	<i>winter oilseed rape</i>	<i>spring oilseed rape*</i>
2010	195	121
2011	193	142
2012	187	119
2013	188	121
2014	192	154

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

## Sugar beet

The overall nitrogen use on sugar beet increased by 2 kg/ha in 2014 to 96 kg/ha, slightly over the five year mean (91 kg/ha). The proportion of crop area receiving a nitrogen dressing was 98%, slightly higher than in recent years. The average field rate of compound nitrogen was unchanged from 2013, although dressing cover with compound nitrogen is low at 21% of the sugar beet area in comparison to 95% dressing cover with straight N. The average field rate of straight nitrogen decreased by 3 kg/ha to 90 kg/ha in 2014.



## B1.2.2 Phosphate and Potash

### Phosphate

In 2014 the overall phosphate rate increased on cereals and decreased on potatoes, oilseed rape and sugar beet. Higher overall rates were caused by an increased percentage dressing cover on winter wheat (Table B1.4) and higher average field rates on barley (Table B1.3b). Lower overall rates were caused by reduced average field rates on potatoes and oilseed rape and lower dressing cover percentages on potatoes and sugar beet. The overall phosphate rate of 29 kg/ha for tillage crops is in line with the 2010-14 five year average (Table B1.2a). There are indications that the declining trend in overall usage of phosphate (and potash) which has been apparent since the late 1990s, driven by reducing annual dressing cover, may have ceased (Figure B2.4).

### Potash

Overall potash use on tillage crops decreased in 2014 by 1 kg/ha, to 39 kg/ha. This is in line with the 2010-14 five year average (Table B1.2a). The decrease in overall potash rate on tillage crops in 2014 was caused by a 1% decrease in the proportion of the crop area receiving a dressing, as the average field rate was unchanged. The average field rates for potash increased on spring barley, winter barley and oilseed rape, and was unchanged for winter wheat. 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. The potash dressing cover percentages increased in 2014 for winter wheat and winter barley, but were unchanged or reduced on the other major tillage crops.

## 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 2014 cereals dressing covers with sulphur were in the 47-57% range. In oilseed rape the 4% increase in dressing cover makes it the highest for the period. (Table B1.8). In 2014 average field rates increased in winter wheat and spring barley, decreased on winter barley with oilseed rape unchanged.

**Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO<sub>3</sub>) of sulphur on cereals and oilseed rape, Great Britain 2010 – 2014**

#### Dressing cover (%)

	winter wheat	winter barley	spring barley	oilseed rape	all tillage
2010	42	44	42	64	40
2011	46	46	40	70	42
2012	52	51	45	73	47
2013	53	50	43	72	47
2014	57	57	47	76	51

#### Average field rate (kg/ha SO<sub>3</sub>)

	winter wheat	winter barley	spring barley	oilseed rape	all tillage
2010	54	48	40	85	59
2011	55	45	39	86	60
2012	54	50	39	86	61
2013	55	54	43	82	58
2014	57	50	45	82	60

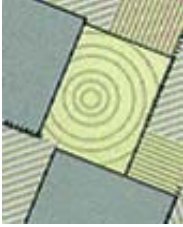


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of the risk of sulphur deficiency in Scotland due to historically extremely low levels of atmospheric sulphur deposition, compared to most other areas of Britain. Arable farmers in England & Wales became more aware of the need to apply sulphur and there has been an increase in the percentage dressing cover figures for all major tillage crops. By 2014 dressing covers in England & Wales have reached parity with, or even exceeded, those in Scotland (Table B1.9).

**Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2010 – 2014**

		<i>winter wheat</i>	<i>winter barley</i>	<i>spring barley</i>	<i>oilseed rape</i>
England & Wales	2010	41	42	42	64
	2011	45	45	40	70
	2012	52	50	45	74
	2013	53	50	46	73
	2014	56	58	50	77
Scotland*	2010	56	52	41	61
	2011	58	50	39	68
	2012	61	54	44	49
	2013	45	45	39	53
	2014	61	46	43	69

\* 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 2010 – 2014**

	<i>straight nitrogen</i>	<i>compound nitrogen</i>	<i>total nitrogen</i>	<i>total phosphate</i>	<i>total potash</i>	<i>total sulphur</i>
2010	30	33	63	10	14	2
2011	28	29	57	9	12	2
2012	25	31	55	9	12	2
2013	28	31	59	9	13	2
2014	30	30	60	10	14	4

Dressing cover for total nitrogen on grass was unchanged in 2014 at 62% (Table B1.11). The long term trend is for declining dressing cover for total nitrogen but the proportion receiving 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 was 70% of the straight N rate of 104 kg/ha.

Overall application rates for phosphate and potash on grass were 10 and 14 kg/ha respectively, a slight increase from 2013.



**Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2010 – 2014**

**Dressing cover (%)**

	<i>straight nitrogen</i>	<i>compound nitrogen</i>	<i>total nitrogen</i>	<i>total phosphate</i>	<i>total potash</i>	<i>total sulphur</i>
2010	29	43	63	43	44	6
2011	28	41	61	41	42	6
2012	26	41	61	41	42	7
2013	28	42	62	42	43	8
2014	29	41	62	41	43	9

**Average field rate (kg/ha)**

	<i>straight nitrogen</i>	<i>compound nitrogen</i>	<i>total nitrogen</i>	<i>total phosphate</i>	<i>total potash</i>	<i>total sulphur</i>
2010	104	76	100	24	32	30
2011	98	72	93	22	29	36
2012	94	75	91	22	29	32
2013	100	74	96	22	29	33
2014	104	72	96	24	32	33

The proportion of the grass area receiving a straight nitrogen dressing increased by 1%, to 29% and the compound N dressing cover decreased by 1% to 41% in 2014. The dressing cover percentage of phosphate on grass decreased by 1% to 41% in 2014, with the potash unchanged. The five year means are 41% and 43% respectively.

Average field rates for phosphate and potash in 2014 increased to 24 kg/ha for phosphate and 32 kg/ha for potash, up from the the historic low rates reported between 2011 and 2013.

### 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 2014 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2010 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.

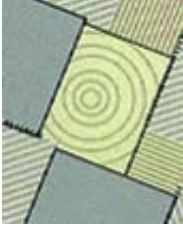
**Table B1.12 Grassland utilisation (% of grass area), Great Britain 2010 – 2014**

	<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>
2010	91	31	12
2011	90	29	11
2012	90	28	10
2013	90	28	12
2014	88	29	11

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2014 is slightly below the five year mean of 90%.

<sup>a</sup> May also be cut.

<sup>b</sup> 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 nitrogen 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 2010 – 2014**

<b>Total nitrogen</b>							
	<i>overall application rate</i>				<i>average field rate</i>		
	<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>		<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>
2010	59	106	48	2010	96	127	82
2011	52	99	40	2011	89	121	71
2012	51	99	47	2012	87	117	75
2013	55	106	44	2013	91	124	77
2014	54	104	44	2014	90	124	76
<b>Straight nitrogen</b>							
	<i>overall application rate</i>				<i>average field rate</i>		
	<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>		<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>
2010	29	50	24	2010	103	116	81
2011	26	46	21	2011	95	115	75
2012	22	43	25	2012	91	105	79
2013	26	50	21	2013	94	112	78
2014	26	52	22	2014	98	119	79
<b>Compound nitrogen</b>							
	<i>overall application rate</i>				<i>average field rate</i>		
	<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>		<i>grazed<sup>a</sup></i>	<i>silage<sup>b</sup></i>	<i>hay<sup>b</sup></i>
2010	30	55	24	2010	72	97	71
2011	26	53	18	2011	68	94	55
2012	28	56	22	2012	71	97	64
2013	29	57	23	2013	71	96	64
2014	28	52	22	2014	70	94	64

In 2014 the overall total nitrogen rate for the grazed category decreased by 1 kg/ha to 54 kg/ha, with the rate on the silage category decreasing by 2 kg/ha to 104 kg/ha.

The average field rates of straight nitrogen increased on all categories of 2014. Compound nitrogen rates decreased on the whole and the long term trend remains downward. The five year means for the overall compound nitrogen rate are 28, 55 and 22 kg/ha for grazed grass, silage and hay respectively, a slight increase 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.

<sup>a</sup> May also be cut.

<sup>b</sup> 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.

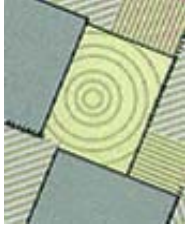
**Table B1.14 Phosphate and potash use (kg/ha) by grassland utilisation, Great Britain 2010 – 2014**

	overall application rate				average field rate		
	grazed <sup>a</sup>	silage <sup>b</sup>	hay <sup>b</sup>		grazed <sup>a</sup>	silage <sup>b</sup>	hay <sup>b</sup>
<b>Total phosphate</b>							
2010	10	16	10	2010	23	29	28
2011	8	15	7	2011	21	27	21
2012	8	15	8	2012	20	27	21
2013	9	16	8	2013	21	28	22
2014	9	15	9	2014	23	28	27
<b>Total potash</b>							
2010	13	26	12	2010	30	44	33
2011	11	24	10	2011	27	41	27
2012	11	25	9	2012	27	41	26
2013	11	27	11	2013	27	44	29
2014	12	26	14	2014	29	44	36

The overall phosphate rate was unchanged on grazed grass in 2014, and reduced by 1 kg/ha on grass cut for silage. The increase reported on grass cut for hay needs to be treated with caution due to the relatively small numbers of grass fields being managed this way (Table B1.14). The corresponding five-year means for grazed grass, silage and hay were 9, 15 and 8 kg/ha, respectively. Average field rates increased by 2 kg/ha on grazed grass and were unchanged on that cut for silage.

Overall potash rates in 2014 increased by 1 kg/ha on grazed grass and decreased by 1 kg/ha on grass cut for silage. The average field rate on grazed grass increased by 2 kg/ha, with the rate on the silage category unchanged at 44 kg/ha.





### B1.3.3 Sulphur

In 2014, 11% of the total grassland area received a sulphur dressing (mean 8% for 2010-14 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 all grass categories increasing by 2 or 3% in 2014.

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 influences on the consistently low level of sulphur fertiliser use on grassland.

**Table B1.15 Sulphur use on grassland, Great Britain 2010 – 2014**

**Dressing cover (%)**

	<i>grazed</i> <sup>a</sup>	<i>silage</i> <sup>b</sup>	<i>hay</i> <sup>b</sup>	<i>all grass</i>
2010	6	11	5	6
2011	6	11	3	6
2012	6	14	7	7
2013	7	16	8	8
2014	10	18	11	11

**Average application rate per year (kg/ha SO<sub>3</sub>)**

	<i>grazed</i> <sup>a</sup>	<i>silage</i> <sup>b</sup>	<i>hay</i> <sup>b</sup>	<i>all grass</i>
2010	29	32	36	30
2011	36	39	39	36
2012	31	34	23	32
2013	31	37	32	33
2014	32	34	28	33

Estimated average field rates of sulphur application peaked for grazed and silage grass in 2007 at 45 kg/ha and 47 kg/ha and for hay in 2008 at 47 kg/ha. In 2014 average field rates decreased on grass cut for hay or silage. The five year means are 32, 35 and 32 kg/ha SO<sub>3</sub> 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.

<sup>a</sup> May also be cut.

<sup>b</sup> May also be grazed.





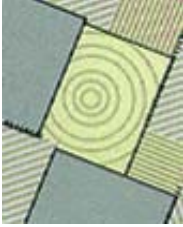
## B2 LONGER TERM TRENDS FOR GREAT BRITAIN

### 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. Some 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 1975 - 2014 and Scotland and Great Britain 1983 – 2014**

	<i>tillage crops</i>			<i>grass</i>			<i>all crops and grass</i>		
	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>
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
2013	138	124	136	57	68	59	95	87	94
2014	149	127	146	58	67	60	101	87	99



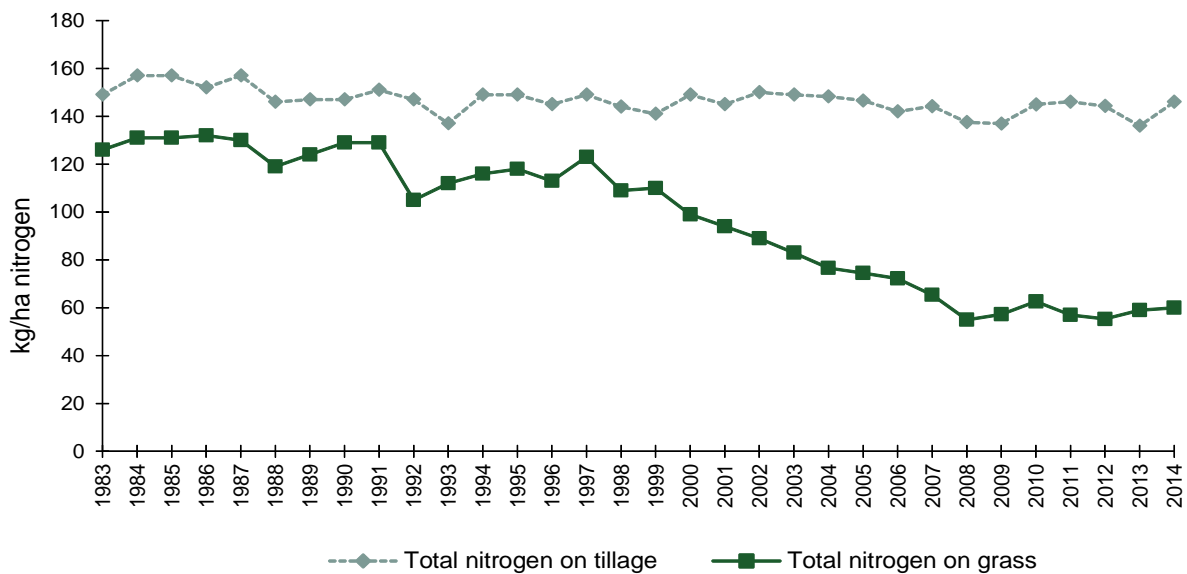
The aggregated data for Great Britain follow a similar pattern to that observed for England & Wales because a large proportion of both the tillage and grassland areas in Britain is located in England & Wales. Overall total nitrogen rates for tillage crops and grassland in England & Wales since 1974 and 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 2014 is back within that range, with the overall rate of nitrogen on tillage crops for Great Britain being 146 kg/ha. The low rate recorded in 2013 was related to the weather and subsequent cropping patterns for that year.

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.

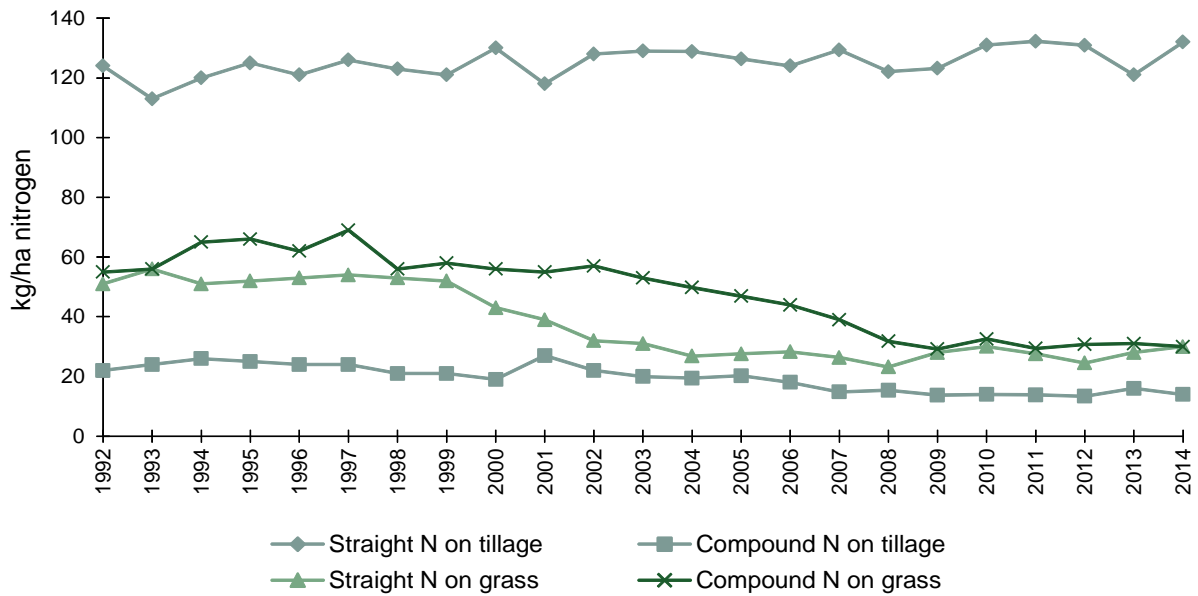
Data on straight and compound nitrogen for Great Britain are not available for the period 1983-91 when the survey in Scotland was separate from the one in England & Wales. Figure B2.2 shows the overall rates of straight and compound nitrogen on tillage crops and grassland. Most of the total nitrogen fertiliser used on tillage crops each year has been applied in straight form. On grassland, since 2009, the overall rates of straight and compound nitrogen have been similar.

**Figure B2.1 Overall application rates (kg/ha) of total nitrogen on tillage crops and grassland, Great Britain 1983 – 2014**





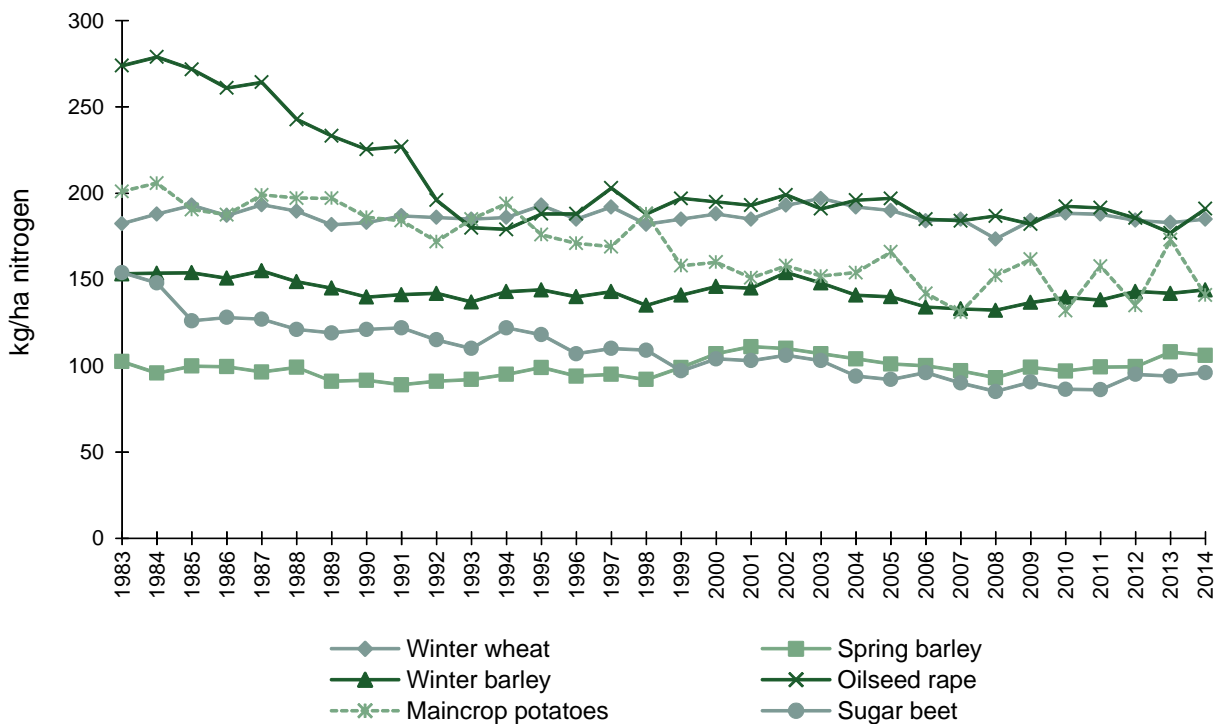
**Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2014**

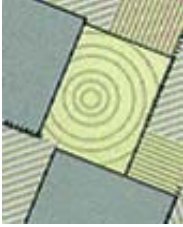


### B2.1.1 Nitrogen use on major tillage crops

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 – 2014**





## 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 – 2014**

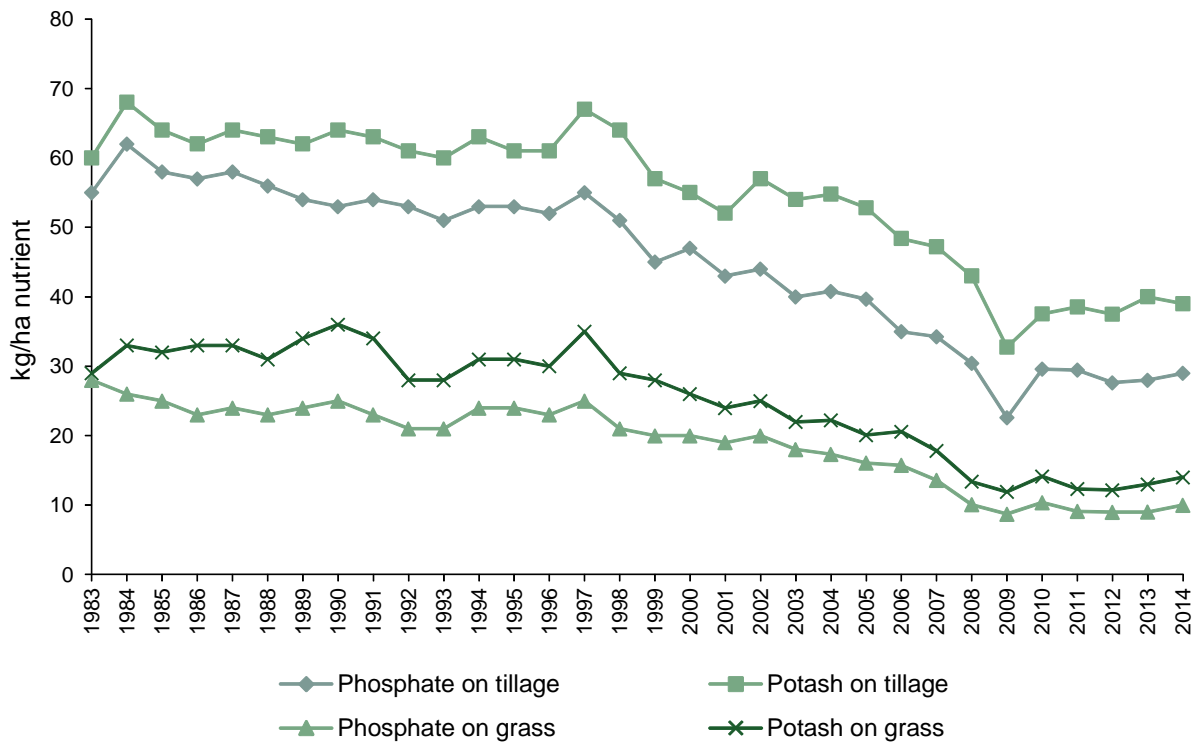
	<i>winter wheat</i>	<i>winter barley</i>	<i>winter oilseed rape</i>	
	<i>dressing cover</i>	<i>dressing cover</i>	<i>dressing cover</i>	<i>application rate</i>
<i>England &amp; Wales</i>				
1984	66	77	-	-
1985	56	64	88	52
1986	44	50	81	52
1987	36	43	74	53
1988	28	31	64	45
1989	18	25	52	45
1990	10	16	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
<i>Great Britain</i>				
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
2013	2	4	32	28
2014	2	5	32	29



## 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 – 2014**

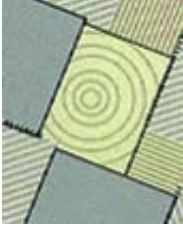


Overall phosphate use on tillage crops declined gradually between 1984 and 1996, from 62 kg/ha to 52 kg/ha. Thereafter the decline in rates became more marked to 2010, with the dip in use in 2009 being caused by a major price increase for the nutrient. The data suggest that, since 2010, overall application rates of phosphate and potash have remained relatively constant. 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. Overall phosphate rates on tillage crops have been consistently higher than those recorded on grass.

The overall rate of phosphate on grassland was highest in 1983, at 28 kg/ha, and then application remained relatively stable at 21-26 kg/ha between 1984 and 1998. Overall application rates have declined more rapidly in the period between 1999 and 2009, where the rates were 20 kg/ha and 9 kg/ha respectively. Since then, the overall rates have remained stable at 9-10 kg/ha.

Overall potash use on tillage crops declined slightly between 1983 and 1997, with the rates in the 60-68 kg/ha range. Like phosphate, overall application rates reduced at a greater rate after this time to 33 kg/ha in 2009. The potash rate in 2009 was the lowest since 1983 and again was thought to be a reaction to the price of the nutrient. Since then, the overall rates of potash on tillage have been in the 37-40 kg/ha range. Again, as for phosphate the application of potash on tillage crops in Scotland has been largely maintained in contrast to the decline seen in England and Wales.

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 2014. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases.



Overall rates of phosphate and potash applied to tillage crops are nearly three times those used on grassland. However there is greater use of applied manures on grassland (32% cover) than on tillage crops (22% cover) and grazed grassland also receives manure as it is grazed.

**Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1969 - 2014 and Scotland and Great Britain 1983 – 2014**

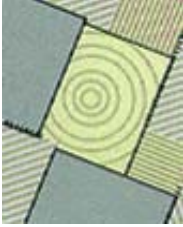
	<i>tillage crops</i>			<i>grass</i>			<i>all crops and grass</i>		
	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>
1969	53	-	-	34	-	-	-	-	-
1970	56	-	-	32	-	-	-	-	-
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
2013	25	51	28	8	14	9	16	27	18
2014	26	50	29	8	15	10	17	26	18



**Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2014 and Scotland and Great Britain 1983 – 2014**

	<i>tillage crops</i>			<i>grass</i>			<i>all crops and grass</i>		
	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>
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
2013	36	68	40	11	19	13	22	36	25
2014	35	67	39	12	20	14	23	35	25





Dressing covers of phosphate and potash on tillage and grass for the period 2004-14 are presented in Tables B2.5a and B2.5b. On tillage crops the phosphate dressing cover has declined in all countries since 2004. However the decline in England and Wales has been much higher (29% reduction) in comparison to Scotland where the reduction was 9% for the period. On grass, phosphate dressing covers have also declined, with the more marked reduction observed in England and Wales.

Potash dressing covers follow a similar pattern to phosphate, with a marked decline on tillage crops in England and Wales.

**Table B2.5a Phosphate dressing covers (%), Great Britain 2004 – 2014**

	<i>tillage crops</i>			<i>grass</i>			<i>all crops and grass</i>		
	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>
2004	61	93	65	55	77	59	58	83	61
2005	60	88	63	50	75	55	55	80	59
2006	52	89	57	52	75	56	52	79	57
2007	50	86	54	47	67	51	48	74	52
2008	46	88	52	37	61	42	42	71	47
2009	34	86	40	33	59	38	34	69	39
2010	45	87	50	37	64	43	41	71	46
2011	45	82	49	36	58	41	41	66	45
2012	42	87	47	37	57	41	39	67	44
2013	43	86	48	38	59	42	40	68	45
2014	44	85	49	36	61	41	40	69	45

**Table B2.5b Potash dressing covers (%), Great Britain 2004 – 2014**

	<i>tillage crops</i>			<i>grass</i>			<i>all crops and grass</i>		
	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>	<i>England &amp; Wales</i>	<i>Scotland</i>	<i>Great Britain</i>
2004	63	93	67	56	75	59	59	82	63
2005	61	90	65	51	71	55	56	78	60
2006	56	91	60	52	71	56	54	78	58
2007	54	90	58	47	65	51	51	74	54
2008	50	90	55	38	61	42	44	71	48
2009	37	88	43	34	61	39	35	71	41
2010	44	89	50	39	63	44	42	72	47
2011	46	84	50	38	57	42	42	66	46
2012	42	90	47	38	58	42	40	68	44
2013	46	87	51	39	59	43	42	69	47
2014	45	86	50	37	63	43	41	70	46



## B2.2.1 Phosphate and potash use on major tillage crops

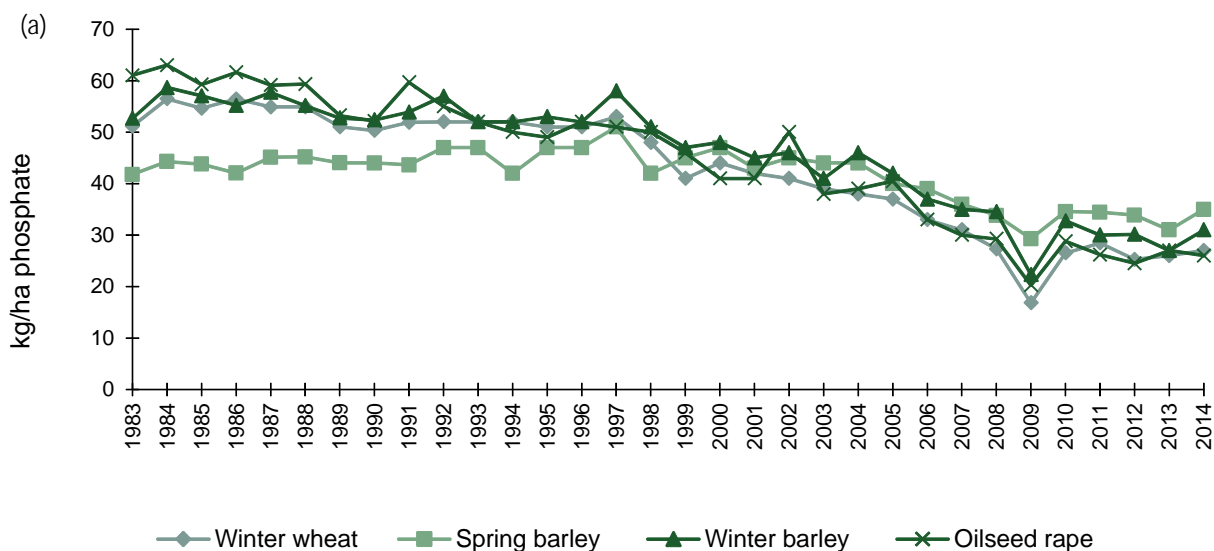
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

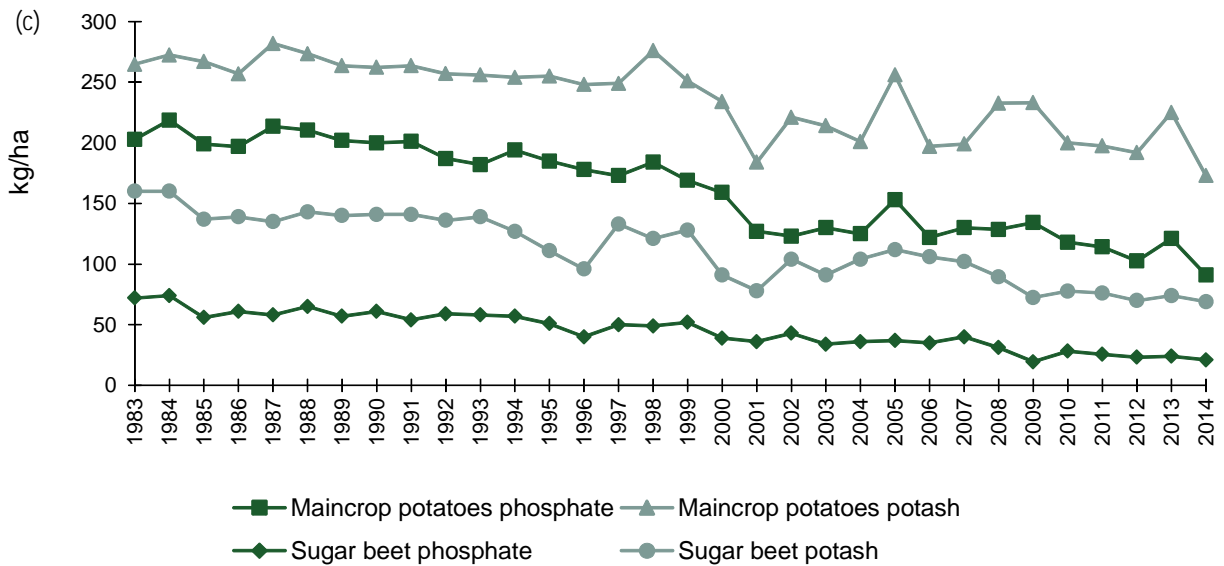
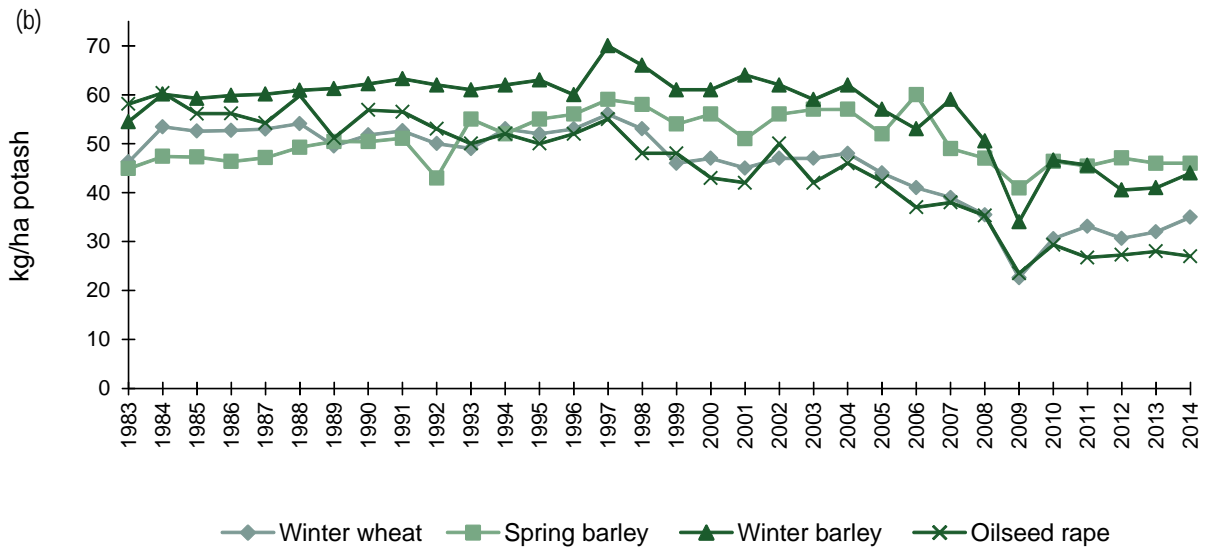
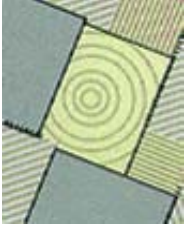
Phosphate use on most major tillage crops has shown a gradual net decline over the survey period. The net decline of phosphate on potatoes has been more dramatic, with a rate of 91 kg/ha reported in 2014, compared to 219 kg/ha in 1984. Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.5(a)). By 1999 the overall phosphate rate had fallen below 50 kg/ha for both crops. From 2000 to 2007 rates were fairly stable in the 31-44 kg/ha range for winter wheat and 35-48 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). In 2010 overall phosphate rates recovered and have stabilised since then. Phosphate use on spring barley was stable between 1983 and 2004 in the range of 42-51 kg/ha. In 2005 the overall rate was 40 kg/ha, which had declined to 35 kg/ha by 2014.

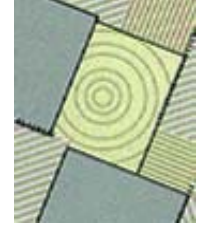
Overall phosphate use has also declined steadily on oilseed rape and sugar beet. Like other crops, the phosphate overall rate dipped in 2009, and as yet has not regained the rates reported in 2008, which were 29 kg/ha for oilseed rape and 31 kg/ha for sugar beet.

On winter wheat, the overall potash rates were fairly consistent between 1983 and 2005, in the range 44-56 kg/ha. Thereafter the rate declined, with a 2009 dip to 23 kg/ha, with modest recoveries since that point. For barley the rates were in the range of 49-61 kg/ha between 1983 and 2008. The rates in 2009 were 41 kg/ha for spring barley and 34 kg/ha for winter barley. In the years since 2009 the overall potash rates have been in the range 41-47 kg/ha. Overall potash rates have fluctuated more on oilseed rape, sugar beet and on potatoes than on the cereal crops. They do follow the general pattern of a dip in rates in 2009, and subsequent modest recoveries.

**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 – 2014**



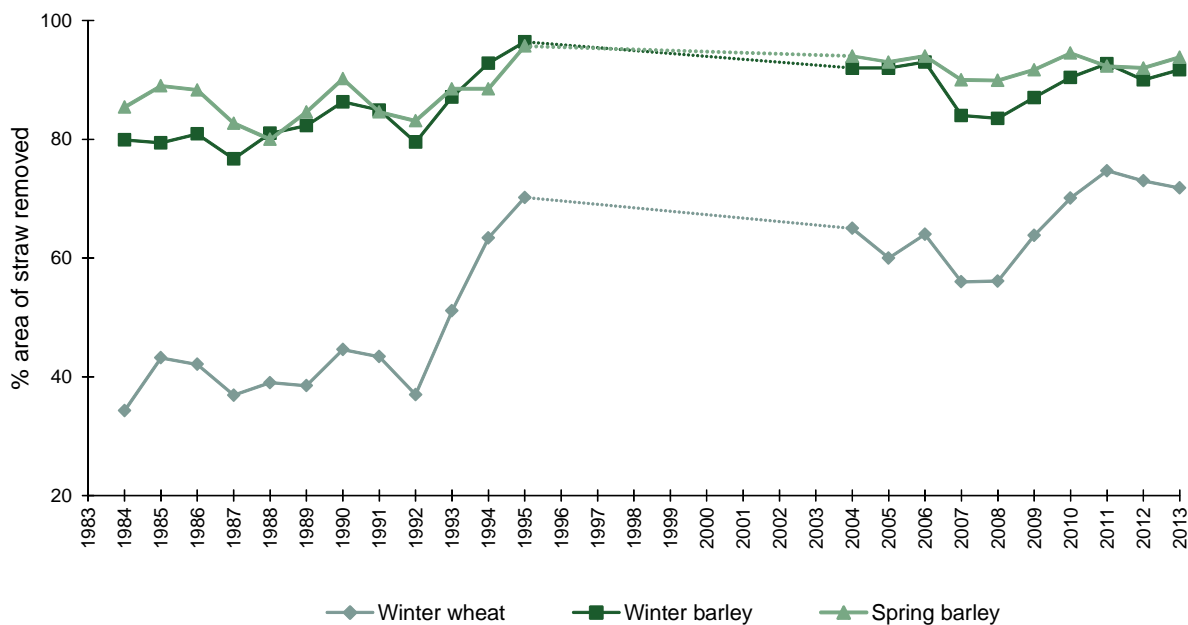




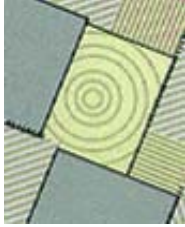
## B2.3 STRAW REMOVAL

Estimates of the percentage of straw removed from wheat and barley fields are shown in Figure B2.6. Wheat and barley straw contains a significant quantity of nutrients, especially potassium. The removal of straw from the field after harvest also removes these nutrients, which would otherwise be returned to the soil when the straw is incorporated. These straws contain on average 1.2-1.5 kg P<sub>2</sub>O<sub>5</sub> (phosphate) per tonne, and 9.5-12.5 kg K<sub>2</sub>O (potash) per tonne, and it is estimated that for every tonne of cereal grain harvested 0.5 tonnes of straw can be baled and removed from the field. Thus the removal of wheat or barley straw will increase the removal of phosphate by about 10% more than if the grain alone were removed, while the amount of potash removed would be approximately doubled. Data collected as part of the 2014 survey will relate to the fate of the straw from the 2013 harvest so is reported against 2013. In 2013 72% of the winter wheat straw was removed from the fields, with the percentages for winter and spring barley much higher at 92 and 94% respectively.

**Figure B2.6 Percentage of straw removed from wheat and barley fields, England and Wales harvest years 1985 – 1995, Great Britain harvest years 2004 - 2013**



Data for the period 1984-95 were sourced from MAFF/Defra straw disposal surveys, those for the period 2004-13 from this survey. No data are available for the period 1996-03. The straw burning ban was introduced in 1993. This resulted in a significant increase in the percentage of straw removed, up to 70% and 96% for wheat and barley respectively, for the 1995 harvest.



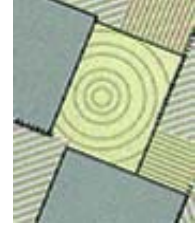
## B2.4 TOTAL QUANTITIES OF NITROGEN PHOSPHATE AND POTASH, UK

Quantities of nitrogen, phosphate and potash used in the UK since 1965 are shown in Table B2.6. These data are based on BSFP findings and trade and sales data. They are compiled by the Agricultural Industries Confederation in conjunction with Defra using the methodology described in Section A2.5. They are considered to be the official figures for fertiliser usage.

**Table B2.6 Quantities of major nutrients used, United Kingdom 1965-2013**

	Nitrogen kt N				Phosphate kt P <sub>2</sub> O <sub>5</sub>				Potash kt K <sub>2</sub> O			
	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
2012	809	125	66	1000	140	43	5	188	193	56	10	259
2013	781	139	79	999	141	46	7	194	194	60	13	267
2014e	838	151	71	1060	146	48	7	201	206	65	13	284

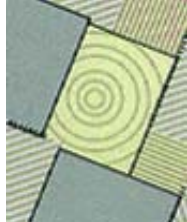
Note: Years are harvest (e.g. 2014 refers to the 2013/14 cropping year) rather than calendar years. Data for 2014 are estimates.



Total nitrogen use in the UK increased from 565 thousand tonnes in 1965 up to 1674 thousand tonnes in 1987 before declining gradually to 1061 thousand tonnes in 2005. Between 2006 and 2014 nitrogen use has remained relatively stable. The drop in 2009 was related to high fertiliser prices. From the peak in 1987, nitrogen use since 2010 has fallen by approximately 40%.

Phosphate use in the UK has fallen since the mid 1980s but since 2007 this decline has slowed and total phosphate use has been more stable between 2010 and 2014 at 184-201 thousand tonnes, but use is still approximately half that compared to use between 1965 and 1985. The low use of 129 thousand tonnes in 2009 was price related.

Potash use in the UK was highest in the mid 1980s through to 1999 after which there has been a more sustained decline. Potash use between 2010 and 2013 has been between 251-284 thousand tonnes, which is around half that used at its peak. The low use of 208 thousand tonnes in 2009 was price related.



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





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Note: 1. Row percentages may not sum to exactly to 100 due to rounding.  
 2. No estimates are shown for crops with 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 2014**

	Crop area receiving dressing (%)					Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	SO <sub>3</sub>	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	85	46	40	36	19	138	50	55	117	23	22	103
Winter wheat	98	45	46	57	16	188	59	74	185	27	35	1530
Spring barley	97	67	68	47	29	110	53	68	106	35	46	747
Winter barley	99	53	60	57	20	146	58	74	144	31	44	520
Oats	89	54	57	40	26	107	55	70	95	29	40	219
Rye/triticale/Durum wheat	71	47	47	61	13	140	-	-	100	-	-	12
Potatoes (seed or earlies)	100	95	60	34	2	127	140	161	127	133	97	7
Potatoes (maincrop)	93	76	77	17	30	151	120	226	141	91	173	110
Sugar beet	98	34	67	45	46	97	61	104	96	21	69	132
Spring oilseed rape	100	59	39	19	6	154	-	-	154	-	-	9
Winter oilseed rape	100	44	39	77	15	192	59	69	191	26	27	532
Linseed	86	40	41	43	20	82	63	72	71	25	29	29
Forage maize	86	54	35	16	86	69	56	84	59	30	30	219
Rootcrops for stockfeed	89	64	82	23	57	79	63	91	71	40	75	69
Leafy forage crops	75	59	59	15	45	85	42	46	64	25	27	48
Arable silage/other fodder crops	45	29	29	6	51	87	39	52	39	11	15	73
Peas - human consumption	2	18	31	6	9	-	69	82	-	12	25	47
Peas - animal consumption	4	16	29	8	9	-	35	65	-	5	19	26
Beans - animal consumption	1	23	22	3	6	-	49	74	-	11	16	133
Vegetables (brassicae)	70	41	54	8	20	139	53	105	97	22	57	30
Vegetables (other)	84	73	71	24	6	118	82	179	99	59	127	58
Soft Fruit	97	70	85	49	2	63	63	83	61	44	71	13
Top Fruit	79	28	77	21	6	83	20	65	66	6	50	22
Other tillage	26	25	19	6	4	118	57	123	30	14	24	55
All tillage	92	49	50	51	22	158	59	78	146	29	39	4743
Grass under 5 years old	82	53	57	19	49	126	31	48	104	16	28	1046
Grass 5 years and over	58	39	40	9	29	86	22	27	50	8	11	2445
All grass	62	41	43	11	32	96	24	32	60	10	14	3491
All crops and grass	76	45	46	29	28	130	41	55	99	18	25	8234

Source: British Survey of Fertiliser Practice 2014

**Table GB1.2 Use of straight fertiliser, Great Britain 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	80	10	3	134	72	96	108	7	3	103
Winter wheat	96	14	16	186	66	81	179	9	13	1530
Spring barley	75	7	9	94	70	85	70	5	8	747
Winter barley	95	9	14	141	70	73	134	7	11	520
Oats	73	8	11	102	59	94	75	5	10	219
Rye/triticale/Durum wheat	71	0	39	130	-	-	93	-	-	12
Potatoes (seed or earlies)	68	19	24	65	-	-	45	-	-	7
Potatoes (maincrop)	58	6	26	106	92	211	62	5	55	110
Sugar beet	95	3	38	90	67	99	85	2	38	132
Spring oilseed rape	100	24	5	154	-	-	154	-	-	9
Winter oilseed rape	99	15	15	187	62	76	186	9	12	532
Linseed	86	6	10	80	-	-	69	-	-	29
Forage maize	56	5	19	72	53	100	40	3	19	219
Rootcrops for stockfeed	36	0	27	92	-	122	33	-	33	69
Leafy forage crops	29	2	2	86	-	-	25	-	-	48
Arable silage/other fodder crops	29	0	1	84	-	-	24	-	-	73
Peas - human consumption	2	6	18	-	-	89	-	-	16	47
Peas - animal consumption	0	6	20	-	-	83	-	-	16	26
Beans - animal consumption	1	10	8	-	52	77	-	5	6	133
Vegetables (brassicae)	28	7	13	151	-	-	43	-	-	30
Vegetables (other)	69	24	35	88	45	183	60	11	65	58
Soft Fruit	97	51	85	59	80	78	57	41	66	13
Top Fruit	34	2	10	52	-	-	17	-	-	22
Other tillage	15	4	3	94	-	-	14	-	-	55
All tillage	84	11	15	157	66	89	132	7	13	4743
Grass under 5 years old	46	2	4	120	35	83	56	1	3	1046
Grass 5 years and over	25	1	1	97	50	66	24	0	1	2445
All grass	29	1	1	104	46	75	30	0	1	3491
All crops and grass	54	6	8	141	64	87	76	3	7	8234

Source: British Survey of Fertiliser Practice 2014

**Table GB1.3 Use of compound fertiliser, Great Britain 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	15	36	37	62	45	51	9	16	19	103
Winter wheat	10	32	31	63	55	69	6	18	22	1530
Spring barley	54	61	60	67	51	64	36	31	38	747
Winter barley	18	44	47	57	55	72	10	24	34	520
Oats	28	46	46	72	53	64	20	24	29	219
Rye/triticale/Durum wheat	39	47	8	-	-	-	-	-	-	12
Potatoes (seed or earlies)	95	95	55	87	126	-	83	120	-	7
Potatoes (maincrop)	66	71	65	119	121	183	79	86	118	110
Sugar beet	21	31	38	48	61	83	10	19	32	132
Spring oilseed rape	0	34	34	-	-	-	-	-	-	9
Winter oilseed rape	16	31	24	28	54	63	5	17	15	532
Linseed	7	35	31	-	57	54	-	20	16	29
Forage maize	50	49	17	38	56	60	19	27	10	219
Rootcrops for stockfeed	67	64	55	56	63	76	37	40	42	69
Leafy forage crops	56	57	57	71	42	46	39	24	26	48
Arable silage/other fodder crops	24	29	29	61	39	49	15	11	14	73
Peas - human consumption	0	13	13	-	61	71	-	8	9	47
Peas - animal consumption	4	9	9	-	-	-	-	-	-	26
Beans - animal consumption	0	13	13	-	47	72	-	6	10	133
Vegetables (brassicae)	47	34	41	114	43	88	54	15	36	30
Vegetables (other)	58	67	59	67	72	106	39	49	63	58
Soft Fruit	20	20	20	-	-	-	-	-	-	13
Top Fruit	66	26	66	73	-	60	48	-	39	22
Other tillage	18	21	17	91	54	125	17	12	21	55
All tillage	23	39	37	62	56	71	14	22	26	4743
Grass under 5 years old	52	52	53	93	30	45	49	16	24	1046
Grass 5 years and over	39	38	39	66	21	26	25	8	10	2445
All grass	41	41	41	72	23	31	30	9	13	3491
All crops and grass	33	40	39	69	38	48	23	15	19	8234

Table GB1.4 Use of lime, Great Britain 2014

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)						Fields limed	Fields in sample
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All		
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	3	103
Winter wheat	4.4	1.1	0.5	0.2	0.4	6.6	4.3	6.2	4.8	4.8	1.7	4.5	102	1530
Spring barley	8.5	0.7	2.4	0.2	2.0	13.8	4.9	3.4	5.0	3.2	0.3	4.2	107	747
Winter barley	5.2	0.3	0.3	0.1	1.0	6.9	4.0	4.0	3.0	3.8	2.7	3.8	44	520
Oats	3.2	1.3	2.8	0.5	0.4	8.2	4.2	5.7	5.1	3.8	0.4	4.5	17	219
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	7
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	110
Sugar beet	2.9	5.3	0.4	12.1	-	20.7	5.2	4.3	2.5	6.5	-	5.7	33	132
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	9
Winter oilseed rape	5.9	1.6	0.8	0.4	0.4	9.1	4.4	2.8	4.8	5.5	0.2	4.0	43	532
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	3	29
Forage maize	9.0	2.2	1.9	-	2.1	15.2	4.6	4.0	4.2	-	0.1	3.9	40	219
Rootcrops for stockfeed	14.2	-	3.0	-	1.7	18.9	4.9	-	3.3	-	0.5	4.3	16	69
Leafy forage crops	11.7	-	1.8	-	7.2	20.7	5.5	-	4.0	-	3.4	4.6	9	48
Arable silage/other fodder crops	5.5	2.1	1.2	-	5.8	14.5	5.2	3.4	4.4	-	0.5	3.0	12	73
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	47
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	26
Beans - animal consumption	0.6	2.4	1.0	-	-	4.1	3.8	4.5	5.0	-	-	4.5	6	133
Vegetables (brassicae)	19.1	-	-	-	-	19.1	2.7	-	-	-	-	2.7	5	30
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	3	58
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	13
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	22
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	3	55
All tillage	5.3	1.1	1.0	0.5	0.9	8.7	4.5	4.7	4.8	5.8	0.9	4.2	449	4743
Grass under 5 years old	5.1	0.4	1.2	-	0.7	7.3	4.4	5.6	4.6	-	2.4	4.3	93	1046
Grass 5 years and over	2.1	0.1	0.5	0.0	0.6	3.3	3.2	4.9	3.0	3.8	2.8	3.1	127	2445
All grass	2.6	0.1	0.6	0.0	0.6	4.0	3.6	5.3	3.6	3.8	2.7	3.5	220	3491
All crops and grass	3.8	0.6	0.8	0.2	0.8	6.1	4.1	4.8	4.3	5.8	1.8	4.0	669	8234

**Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Grazed not mown	53	36	36	17	79	20	22	42	7	8	1584
Grazed mown	76	50	52	56	107	28	40	81	14	21	1353
All grazings	60	41	41	30	90	23	29	54	9	12	2937
Cut for silage - grazed	83	56	58	65	119	28	42	98	16	24	941
Cut for silage - not grazed	87	50	57	68	136	28	50	119	14	29	384
All cut for silage	84	55	58	66	124	28	44	104	15	26	1325
Cut for hay - grazed	57	34	36	37	74	26	36	42	9	13	450
Cut for hay - not grazed	62	41	45	20	85	29	36	53	12	16	139
All cut for hay	58	35	38	34	76	27	36	44	9	14	589
All mowings	77	50	53	57	114	28	43	88	14	23	1864
All grass	62	41	43	32	96	24	32	60	10	14	3491

Source: British Survey of Fertiliser Practice 2014

**Table GB3.0 Product use by month of application, Great Britain 2014**

**(a) Product use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	4	34	39	15	4	2	1
Straight P	16	5	3	0	0	10	29	26	4	0	0	7
Straight K	5	5	4	3	1	16	36	26	4	1	1	0
Compounds	6	3	1	1	0	2	25	36	14	7	3	3
All fertilisers	3	1	1	0	0	4	31	37	14	5	2	2

**(b) Nutrient use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	3	30	41	16	5	2	1
Phosphate	9	6	2	1	0	5	30	30	9	2	1	4
Potash	6	5	2	1	1	7	31	30	9	4	2	2
Total	3	2	1	0	0	4	30	37	14	5	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 2014.

'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<sub>2</sub>O<sub>5</sub> and 10 kg of K<sub>2</sub>O, 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 B2.6.



**Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2014**

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	34.5	50.0	9.8	23.6	47.2	20.0	41.7	32.0	27.4	30.1	19.3	31.3	39.1
Urea	5.1	10.1	3.3	2.3	14.4	3.0	8.7	3.8	4.2	3.5	1.2	3.9	7.5
Calcium Ammonium Nitrate (CAN)	1.2	1.1	0.0	0.7	1.1	1.0	1.0	1.9	1.9	1.4	0.0	1.6	1.2
Urea Ammonium Nitrate (UAN)	8.6	11.5	0.2	4.9	13.1	3.2	9.8	1.4	1.9	1.2	51.3	1.9	7.8
Other Straight N	2.3	2.3	2.7	1.1	4.4	2.9	2.6	0.8	0.7	0.5	0.0	0.7	2.1
Triple Superphosphate (TSP)	2.1	2.6	1.6	1.0	2.5	3.7	2.5	0.5	0.7	0.5	1.1	0.5	2.0
Other Straight P	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.5	0.0	0.0	0.3	0.1
Muriate of Potash (MOP)	2.5	3.1	7.8	2.3	2.8	7.2	3.5	0.9	3.3	0.9	10.1	1.2	2.9
Other Straight K	0.1	0.2	0.0	21.8	0.0	5.4	1.5	0.1	0.0	0.2	0.0	0.1	1.1
PK	7.1	11.7	1.1	21.9	7.0	10.0	10.1	2.4	4.2	1.9	11.2	2.5	8.2
NK	3.5	1.2	1.5	1.7	0.4	4.1	1.7	5.1	3.4	8.5	0.0	5.8	2.7
Low N (<19% N)	15.6	3.3	67.1	7.5	5.5	24.2	10.4	3.0	4.5	3.0	2.4	3.3	8.6
High N (>=19% N)	17.3	2.8	3.9	2.2	0.5	12.4	5.5	47.6	47.3	48.1	3.5	46.8	16.1
Other	0.1	0.2	0.8	8.8	0.9	2.8	0.9	0.1	0.0	0.1	0.0	0.1	0.7
<b>Total product ('000 tonnes)</b>	<b>401</b>	<b>1633</b>	<b>85</b>	<b>99</b>	<b>473</b>	<b>158</b>	<b>2849</b>	<b>1030</b>	<b>113</b>	<b>635</b>	<b>13</b>	<b>1275</b>	<b>4125</b>

Source: British Survey of Fertiliser Practice 2014

**Table GB3.2 Use of product type by crop group, Great Britain 2014**

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	10.8	65.9	0.8	1.8	18.1	2.6	75.1	78.2	8.0	51.2	0.5	24.9	1577
Urea	6.7	63.4	1.6	0.9	25.4	2.0	87.3	77.1	10.6	51.0	0.1	12.7	350
Calcium Ammonium Nitrate (CAN)	12.4	61.8	0.0	3.4	19.4	3.1	51.0	85.0	7.8	44.6	0.0	49.0	59
Urea Ammonium Nitrate (UAN)	9.5	65.7	0.1	1.6	21.5	1.6	94.1	66.2	5.4	38.2	35.6	5.9	350
Other Straight N	12.0	49.0	8.4	0.8	24.5	5.3	86.8	75.6	13.7	33.2	0.0	13.2	84
Triple Superphosphate (TSP)	12.7	60.8	1.3	0.7	17.0	7.5	92.6	87.3	25.1	31.1	2.0	7.4	81
Other Straight P	0.0	44.9	0.0	0.0	49.3	5.8	44.2	100.0	26.7	0.0	0.0	55.8	7
Muriate of Potash (MOP)	10.2	53.6	7.3	1.8	13.1	13.9	90.7	65.9	32.8	36.5	15.7	9.3	102
Other Straight K	0.3	5.7	0.0	61.1	0.5	32.5	97.7	74.9	0.0	100.0	0.0	2.3	40
PK	9.9	67.4	0.5	6.5	11.0	4.9	90.3	83.0	10.2	34.0	4.9	9.7	305
NK	28.0	42.2	2.5	5.4	1.5	20.4	42.6	66.5	8.8	80.1	0.0	57.4	117
Low N (<19% N)	35.4	16.7	21.4	1.9	9.9	14.7	85.7	76.2	11.1	44.5	0.2	14.3	276
High N (>=19% N)	50.7	32.4	2.1	1.4	1.2	12.2	16.9	84.8	8.5	48.1	0.0	83.1	746
Other	1.9	8.0	3.2	54.7	13.1	19.1	98.5	76.3	0.0	100.0	0.0	1.5	29
<b>All Fertilisers</b>	<b>14.1</b>	<b>57.3</b>	<b>3.0</b>	<b>3.5</b>	<b>16.6</b>	<b>5.5</b>	<b>69.1</b>	<b>80.7</b>	<b>8.8</b>	<b>49.8</b>	<b>1.0</b>	<b>30.9</b>	<b>4125</b>

Source: British Survey of Fertiliser Practice 2014

**Table GB3.3 Product use by month of application, Great Britain 2014**

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	3.7	31.1	40.8	15.8	4.8	2.1	1.0	0.5	0.1	0.0	0.0	1577
Urea	0.0	6.3	39.3	35.2	13.4	3.0	1.7	0.2	0.4	0.1	0.5	0.0	350
Calcium Ammonium Nitrate (CAN)	0.0	1.2	28.7	37.3	18.6	3.5	5.6	4.6	0.5	0.0	0.0	0.0	59
Urea Ammonium Nitrate (UAN)	0.0	3.9	36.6	41.3	15.9	1.3	0.0	0.4	0.4	0.1	0.0	0.0	350
Other Straight N	0.0	6.2	54.3	25.4	9.7	2.2	1.7	0.3	0.2	0.0	0.0	0.0	84
Triple Superphosphate (TSP)	0.3	10.1	31.9	22.9	4.2	0.0	0.0	5.6	15.7	5.1	3.7	0.5	81
Other Straight P	0.0	2.6	0.0	55.8	0.0	0.0	0.0	21.8	19.9	0.0	0.0	0.0	7
Muriate of Potash (MOP)	0.3	13.8	39.6	27.5	5.0	0.8	0.7	0.4	4.3	3.5	2.5	1.5	102
Other Straight K	1.6	20.8	25.4	22.4	1.8	0.0	0.5	0.0	5.4	9.1	6.2	6.6	40
PK	1.7	6.3	27.6	12.7	3.9	0.4	0.0	4.9	22.8	13.2	3.5	3.1	305
NK	0.0	2.6	21.6	19.2	24.8	21.7	7.3	2.7	0.2	0.0	0.0	0.0	117
Low N (<19% N)	0.0	3.4	39.8	37.7	7.1	1.2	0.8	3.6	2.9	2.7	0.5	0.2	276
High N (>=19% N)	0.0	0.7	19.0	46.6	18.1	8.8	4.3	2.0	0.3	0.1	0.0	0.0	746
Other	1.2	7.4	22.9	26.9	0.8	40.7	0.0	0.0	0.0	0.0	0.1	0.0	29
<b>All Fertilisers</b>	<b>0.2</b>	<b>4.1</b>	<b>30.6</b>	<b>37.2</b>	<b>14.0</b>	<b>4.9</b>	<b>2.1</b>	<b>1.7</b>	<b>2.7</b>	<b>1.5</b>	<b>0.5</b>	<b>0.4</b>	<b>4125</b>

Source: British Survey of Fertiliser Practice 2014

**Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	93	40	34	4	150	58	56	140	23	19	36
Winter wheat	99	50	44	10	197	59	69	195	30	31	682
Spring barley	99	62	63	14	116	56	76	115	35	47	193
Winter barley	100	63	64	9	147	61	78	147	39	50	159
Oats	100	63	61	17	111	56	69	111	35	42	66
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	100	87	100	51	155	137	259	155	119	259	6
Sugar beet	100	32	60	46	93	72	107	93	23	64	28
Spring oilseed rape	100	58	36	0	160	-	-	160	-	-	6
Winter oilseed rape	100	47	40	13	195	56	68	194	26	27	308
Linseed	100	50	47	8	83	63	56	83	32	26	19
Forage maize	87	73	45	62	72	63	108	63	46	49	28
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	0
Arable silage/other fodder crops	30	27	27	43	-	-	-	-	-	-	7
Peas - human consumption	0	5	11	0	-	-	-	-	-	-	15
Peas - animal consumption	0	13	35	0	-	-	71	-	-	25	15
Beans - animal consumption	2	20	19	5	-	49	69	-	10	13	74
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	1
Vegetables (other)	44	0	6	11	52	-	-	23	-	-	10
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	21	22	5	0	105	64	-	23	14	-	14
All tillage	94	51	46	12	174	59	73	163	30	34	1672
Grass under 5 years old	79	41	42	20	116	38	66	91	15	28	97
Grass 5 years and over	42	20	20	2	73	27	38	30	5	8	255
All grass	50	25	25	6	88	31	49	45	8	12	352
All crops and grass	88	47	43	11	167	57	71	147	27	31	2024

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

Source: British Survey of Fertiliser Practice 2014

**Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	82	47	37	3	127	60	64	104	28	24	39
Winter wheat	99	40	52	10	188	58	85	187	23	44	390
Spring barley	97	58	62	9	108	54	66	106	31	41	159
Winter barley	100	49	62	2	142	56	78	142	27	48	120
Oats	88	32	54	4	107	44	96	94	14	51	38
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	100	100	70	3	133	149	-	133	149	-	5
Potatoes (maincrop)	93	74	73	28	148	123	229	137	91	168	79
Sugar beet	97	35	67	44	99	59	101	96	21	68	93
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	38	35	10	187	66	74	187	25	25	118
Linseed	56	11	49	44	88	-	-	49	-	-	6
Forage maize	82	33	37	57	92	110	130	75	36	49	25
Rootcrops for stockfeed	100	24	85	64	99	-	179	99	-	152	10
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/other fodder crops	-	-	-	-	-	-	-	-	-	-	4
Peas - human consumption	3	27	44	11	-	72	85	-	19	37	29
Peas - animal consumption	24	24	24	0	-	-	-	-	-	-	5
Beans - animal consumption	0	29	22	6	-	50	92	-	15	20	39
Vegetables (brassicae)	57	31	33	21	138	66	107	78	21	35	23
Vegetables (other)	90	82	79	5	136	85	186	123	69	147	37
Soft Fruit	96	83	83	2	68	63	91	65	52	76	12
Top Fruit	83	30	76	7	83	20	62	69	6	47	20
Other tillage	32	31	33	2	127	54	128	41	17	42	25
All tillage	91	44	53	13	157	65	96	143	28	51	1284
Grass under 5 years old	83	63	68	23	97	34	55	80	21	37	71
Grass 5 years and over	49	30	30	11	79	23	35	38	7	11	171
All grass	56	37	38	13	84	27	42	47	10	16	242
All crops and grass	84	42	50	13	146	58	87	123	24	44	1526

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 2014

**Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	70	50	50	68	123	36	71	85	18	35	13
Winter wheat	95	35	35	63	157	59	57	149	20	20	93
Spring barley	84	51	55	61	85	41	47	72	21	26	61
Winter barley	97	38	44	47	135	54	60	131	21	26	38
Oats	33	12	12	73	113	-	-	37	-	-	12
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	100	100	100	19	98	103	142	98	103	142	5
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	30	30	52	173	-	-	173	-	-	7
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	87	47	33	97	70	52	65	61	24	21	95
Rootcrops for stockfeed	62	38	62	71	57	-	66	35	-	41	12
Leafy forage crops	64	28	28	72	-	-	-	-	-	-	6
Arable silage/other fodder crops	42	24	24	67	84	33	33	36	8	8	24
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	4
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	4
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	84	42	39	71	109	50	59	92	21	23	384
Grass under 5 years old	85	36	44	79	168	27	55	143	10	24	230
Grass 5 years and over	81	37	41	62	141	23	39	114	9	16	397
All grass	82	37	42	67	149	24	44	123	9	18	627
All crops and grass	83	38	41	68	141	30	47	117	11	19	1011

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

Source: British Survey of Fertiliser Practice 2014

**Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	-	-	-	-	-	-	-	-	-	-	4
Winter wheat	100	44	48	52	137	45	51	137	20	25	65
Spring barley	95	82	80	64	91	47	57	86	39	45	135
Winter barley	98	59	61	65	135	47	58	132	28	35	64
Oats	79	55	65	39	95	60	58	74	33	38	46
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	22	22	58	168	-	-	168	-	-	6
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	84	82	19	100	50	47	64	42	39	12	39
Rootcrops for stockfeed	92	82	93	25	65	76	75	60	62	70	35
Leafy forage crops	94	83	83	46	89	39	45	84	32	37	28
Arable silage/other fodder crops	67	64	64	64	79	32	42	53	20	27	20
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicacae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	0
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	4
All tillage	93	67	63	61	104	49	57	97	33	35	452
Grass under 5 years old	85	66	67	50	107	30	40	91	20	27	434
Grass 5 years and over	55	42	42	28	68	21	23	37	9	10	1284
All grass	58	45	45	30	75	22	26	44	10	12	1718
All crops and grass	60	46	46	32	78	25	29	47	11	13	2170

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 2014

**Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	62	62	62	78	160	29	29	100	18	18	11
Winter wheat	96	42	50	34	173	64	79	166	27	40	280
Spring barley	98	78	77	43	113	53	67	111	41	51	194
Winter barley	97	48	58	31	153	59	70	148	28	41	130
Oats	89	58	56	38	105	54	65	94	32	36	57
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	2
Potatoes (maincrop)	89	73	75	28	179	107	220	160	78	164	17
Sugar beet	100	11	74	68	103	-	113	103	-	84	7
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	49	48	30	187	64	68	187	31	33	84
Linseed	-	-	-	-	-	-	-	-	-	-	3
Forage maize	83	33	44	88	73	44	86	60	15	38	31
Rootcrops for stockfeed	100	78	78	89	61	80	88	61	63	68	8
Leafy forage crops	58	31	31	55	56	-	-	33	-	-	10
Arable silage/other fodder crops	33	15	15	28	74	-	-	24	-	-	18
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Beans - animal consumption	0	25	32	13	-	47	57	-	12	18	15
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetables (other)	86	86	86	3	60	69	149	52	59	129	7
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	5	5	0	19	-	-	-	-	-	-	9
All tillage	92	53	57	37	147	59	76	136	31	43	897
Grass under 5 years old	77	56	60	26	115	32	52	89	18	31	212
Grass 5 years and over	57	37	38	12	84	24	29	48	9	11	329
All grass	63	42	44	16	95	27	38	60	12	17	541
All crops and grass	78	48	51	27	127	45	60	99	22	31	1438

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

Source: British Survey of Fertiliser Practice 2014

Table EW1.1 Total fertiliser use, England & Wales 2014

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	85	46	40	18	140	51	56	120	23	22	96
Winter wheat	98	44	45	16	189	59	73	186	26	33	1419
Spring barley	95	45	48	24	112	49	61	106	22	29	495
Winter barley	98	50	57	20	143	57	72	141	28	41	461
Oats	89	44	48	20	108	51	71	96	22	34	170
Rye/triticale/Durum wheat	71	47	47	13	140	-	-	100	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	93	74	75	33	148	124	221	137	92	165	101
Sugar beet	98	34	67	46	97	61	104	96	21	69	132
Spring oilseed rape	100	59	39	6	154	-	-	154	-	-	9
Winter oilseed rape	99	43	37	15	192	58	68	191	25	25	498
Linseed	86	40	41	20	82	63	72	71	25	29	29
Forage maize	86	55	35	86	70	56	85	60	30	30	214
Rootcrops for stockfeed	88	56	79	56	79	43	82	69	24	65	50
Leafy forage crops	57	34	34	46	64	50	52	37	17	18	27
Arable silage/other fodder crops	34	21	21	49	77	39	52	26	8	11	55
Vining peas (for human consumption)	2	18	29	9	-	72	86	-	13	25	40
Field peas (harvested dry)	4	16	29	9	-	35	65	-	5	19	26
Field beans (harvested dry)	1	23	22	6	-	49	74	-	11	16	131
Vegetables (brassicae)	68	36	50	16	127	49	95	86	17	47	28
Vegetable Other	81	69	67	7	130	85	186	106	58	124	53
Soft Fruit	97	70	85	2	63	63	83	61	44	71	13
Top Fruit	79	28	77	6	83	20	65	66	6	50	22
Other tillage	27	27	20	4	118	57	123	32	15	25	52
All tillage	92	44	45	21	163	59	78	149	26	35	4137
Grass less than five years old	82	45	49	54	129	28	49	105	13	24	765
Grass five years and over	55	34	35	31	88	22	28	48	8	10	2036
All grass	60	36	37	35	97	24	33	58	8	12	2801
All crops and grass	75	40	41	28	135	42	57	101	17	23	6938

Source: British Survey of Fertiliser Practice 2014



**Table EW1.2 Use of straight fertiliser, England & Wales 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	83	10	3	134	72	96	111	7	3	96
Winter wheat	97	13	15	187	66	81	180	9	12	1419
Spring barley	83	7	11	105	68	79	88	5	8	495
Winter barley	95	9	13	139	70	72	132	6	10	461
Oats	77	9	13	108	60	106	83	6	13	170
Rye/triticale/Durum wheat	71	0	39	130	-	-	93	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	59	7	22	103	92	233	60	6	51	101
Sugar beet	95	3	38	90	67	99	85	2	38	132
Spring oilseed rape	100	24	5	154	-	-	154	-	-	9
Winter oilseed rape	99	15	15	188	62	76	187	9	11	498
Linseed	86	6	10	80	-	-	69	-	-	29
Forage maize	56	5	20	74	53	100	41	3	20	214
Rootcrops for stockfeed	45	0	33	93	-	119	42	-	40	50
Leafy forage crops	27	0	0	56	-	-	15	-	-	27
Arable silage/other fodder crops	25	0	1	70	-	-	17	-	-	55
Peas - human consumption	2	4	16	-	-	99	-	-	15	40
Peas - animal consumption	0	6	20	-	-	83	-	-	16	26
Beans - animal consumption	1	10	8	-	52	77	-	5	6	131
Vegetables (brassicacae)	29	7	7	152	-	-	44	-	-	28
Vegetables (other)	76	28	39	87	45	185	66	13	72	53
Soft Fruit	97	51	85	59	80	78	57	41	66	13
Top Fruit	34	2	10	52	-	-	17	-	-	22
Other tillage	16	4	3	94	-	-	15	-	-	52
All tillage	86	11	15	161	65	89	139	7	13	4137
Grass under 5 years old	54	2	4	124	37	82	67	1	4	765
Grass 5 years and over	27	1	1	101	52	70	27	1	1	2036
All grass	31	1	1	107	48	76	33	1	1	2801
All crops and grass	57	6	8	146	63	88	84	4	7	6938

**Table EW1.3 Use of compound fertiliser, England & Wales 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Spring wheat	14	35	36	63	45	52	9	16	19	96
Winter wheat	9	31	30	60	55	69	5	17	21	1419
Spring barley	28	39	39	67	45	54	19	18	21	495
Winter barley	16	41	44	62	53	72	10	22	31	461
Oats	19	35	36	68	47	58	13	17	21	170
Rye/triticale/Durum wheat	39	47	8	-	-	-	-	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	63	68	63	122	125	183	77	86	114	101
Sugar beet	21	31	38	48	61	83	10	19	32	132
Spring oilseed rape	0	34	34	-	-	-	-	-	-	9
Winter oilseed rape	14	30	23	28	53	62	4	16	14	498
Linseed	7	35	31	-	57	54	-	20	16	29
Forage maize	51	50	17	37	56	60	19	28	10	214
Rootcrops for stockfeed	60	56	46	46	43	55	28	24	25	50
Leafy forage crops	34	34	34	63	50	52	22	17	18	27
Arable silage/other fodder crops	16	21	21	58	39	47	9	8	10	55
Peas - human consumption	0	14	14	-	61	71	-	8	10	40
Peas - animal consumption	4	9	9	-	-	-	-	-	-	26
Beans - animal consumption	0	13	13	-	47	72	-	6	10	131
Vegetables (brassicae)	43	29	43	98	34	82	42	10	35	28
Vegetables (other)	52	62	55	78	73	95	40	45	52	53
Soft Fruit	20	20	20	-	-	-	-	-	-	13
Top Fruit	66	26	66	73	-	60	48	-	39	22
Other tillage	19	22	18	91	54	125	17	12	22	52
All tillage	16	34	31	59	55	70	10	19	22	4137
Grass under 5 years old	43	43	45	91	28	46	39	12	21	765
Grass 5 years and over	34	34	34	64	21	27	22	7	9	2036
All grass	35	35	36	69	22	31	24	8	11	2801
All crops and grass	26	34	34	66	38	49	17	13	16	6938

Source: British Survey of Fertiliser Practice 2014

Table EW1.4 Use of lime, England & Wales 2014

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)						Fields limed	Fields in sample
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All		
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	2	96
Winter wheat	4.3	1.1	0.2	0.2	0.3	6.1	4.3	6.2	4.2	4.8	0.2	4.5	85	1419
Spring barley	3.2	1.2	0.6	0.4	0.6	5.9	4.7	3.3	4.7	3.2	0.5	3.9	43	495
Winter barley	4.8	0.3	0.4	0.1	0.7	6.1	4.1	3.8	3.0	3.8	3.8	4.0	34	461
Oats	0.9	1.8	0.1	0.7	0.5	4.0	5.0	5.7	10.0	3.8	0.4	4.7	8	170
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	4
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	101
Sugar beet	2.9	5.3	0.4	12.1	-	20.7	5.2	4.3	2.5	6.5	-	5.7	33	132
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	9
Winter oilseed rape	6.0	1.6	0.7	0.4	0.3	9.0	4.3	2.8	4.1	5.5	0.2	4.0	39	498
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	3	29
Forage maize	8.6	2.3	2.0	-	2.1	15.0	4.6	4.0	4.2	-	0.1	3.8	39	214
Rootcrops for stockfeed	16.4	-	1.0	-	2.2	19.6	5.0	-	5.0	-	0.5	4.5	13	50
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	0	27
Arable silage/other fodder crops	0.6	2.5	1.4	-	3.6	8.1	5.0	3.4	4.4	-	0.6	2.5	5	55
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	40
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	26
Beans - animal consumption	0.6	2.4	1.0	-	-	4.1	3.8	4.5	5.0	-	-	4.5	6	131
Vegetables (brassicacae)	-	-	-	-	-	-	-	-	-	-	-	-	4	28
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	2	53
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	13
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	22
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	2	52
All tillage	4.3	1.2	0.4	0.5	0.5	7.1	4.3	4.7	4.2	5.8	0.7	4.2	321	4137
Grass under 5 years old	5.0	0.5	1.0	-	0.3	6.8	4.2	5.6	4.3	-	1.7	4.2	61	765
Grass 5 years and over	2.4	0.1	0.4	0.0	0.5	3.5	3.1	4.9	2.4	3.8	3.9	3.2	104	2036
All grass	2.8	0.1	0.5	0.0	0.5	4.0	3.4	5.3	3.0	3.8	3.6	3.5	165	2801
All crops and grass	3.6	0.7	0.5	0.3	0.5	5.5	3.9	4.8	3.5	5.8	2.2	3.9	486	6938

Source: British Survey of Fertiliser Practice 2014

**Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	15	2	2	4	4	14	19	25	16	1	-	-	-	-	-	-	-	-	96
Winter wheat	2	0	1	3	3	4	7	16	20	23	12	6	3	1	-	-	-	-	1419
Spring barley	5	0	5	11	16	22	30	9	1	1	-	-	-	-	-	-	-	-	495
Winter barley	2	0	2	2	9	13	27	26	13	5	1	-	-	-	-	-	-	-	461
Oats	11	0	3	8	18	35	21	3	-	-	-	-	-	-	-	-	-	-	170
Rye/triticale/Durum wheat	29	0	0	0	0	26	39	0	7	-	-	-	-	-	-	-	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	7	2	2	20	5	5	8	23	7	7	2	12	-	-	-	-	-	-	101
Sugar beet	2	0	8	13	27	36	14	-	-	-	-	-	-	-	-	-	-	-	132
Spring oilseed rape	0	0	0	6	0	19	0	74	-	-	-	-	-	-	-	-	-	-	9
Winter oilseed rape	1	0	1	1	3	2	8	14	24	26	14	5	1	-	-	-	-	-	498
Linseed	14	0	12	23	27	20	5	-	-	-	-	-	-	-	-	-	-	-	29
Forage maize	14	16	15	17	15	13	7	1	-	-	-	-	-	-	-	-	-	-	214
Rootcrops for stockfeed	12	2	22	20	14	17	9	3	-	-	-	-	-	-	-	-	-	-	50
Leafy forage crops	43	0	14	24	11	8	-	-	-	-	-	-	-	-	-	-	-	-	27
Arable silage/other fodder crops	66	2	7	8	6	5	6	1	-	-	-	-	-	-	-	-	-	-	55
Peas - human consumption	98	0	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	96	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Beans - animal consumption	99	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131
Vegetables (brassicae)	32	12	6	2	12	0	11	1	13	3	0	0	0	7	-	-	-	-	28
Vegetables (other)	19	1	5	9	5	10	18	28	1	5	-	-	-	-	-	-	-	-	53
Soft Fruit	3	0	50	14	20	0	13	-	-	-	-	-	-	-	-	-	-	-	13
Top Fruit	21	5	4	16	9	38	6	-	-	-	-	-	-	-	-	-	-	-	22
Other tillage	73	3	1	4	8	4	1	1	0	0	6	-	-	-	-	-	-	-	52
All tillage	8	1	2	5	7	9	12	14	14	15	8	3	1	1	-	-	-	-	4137
Grass under 5 years old	18	1	9	11	15	6	10	9	7	4	4	3	2	0	0	1	-	-	765
Grass 5 years and over	45	2	14	15	8	4	3	3	2	1	1	1	-	-	-	-	-	-	2036
All grass	40	2	13	14	9	5	4	4	2	1	1	1	1	-	-	-	-	-	2801
All crops and grass	25	1	8	10	8	7	8	9	8	8	4	2	1	-	-	-	-	-	6938

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2014

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	54	14	9	12	9	3	-	-	-	-	-	-	-	-	-	-	-	-	96
Winter wheat	56	4	13	17	7	1	1	-	-	-	-	-	-	-	-	-	-	-	1419
Spring barley	55	6	17	18	3	0	0	1	-	-	-	-	-	-	-	-	-	-	495
Winter barley	50	5	13	23	6	1	0	1	-	-	-	-	-	-	-	-	-	-	461
Oats	56	4	17	16	6	1	-	-	-	-	-	-	-	-	-	-	-	-	170
Rye/triticale/Durum wheat	53	0	0	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	26	3	6	16	10	7	8	9	5	2	3	3	0	0	4	-	-	-	101
Sugar beet	66	7	6	11	6	1	2	1	-	-	-	-	-	-	-	-	-	-	132
Spring oilseed rape	41	0	5	19	34	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Winter oilseed rape	57	5	11	17	6	1	1	-	-	-	-	-	-	-	-	-	-	-	498
Linseed	60	3	3	24	7	1	2	-	-	-	-	-	-	-	-	-	-	-	29
Forage maize	45	11	11	27	2	4	0	0	0	0	0	1	-	-	-	-	-	-	214
Rootcrops for stockfeed	44	4	36	9	6	-	-	-	-	-	-	-	-	-	-	-	-	-	50
Leafy forage crops	66	10	6	5	10	4	-	-	-	-	-	-	-	-	-	-	-	-	27
Arable silage/other fodder crops	79	5	9	5	0	2	-	-	-	-	-	-	-	-	-	-	-	-	55
Peas - human consumption	82	1	4	0	11	3	-	-	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	84	8	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Beans - animal consumption	77	2	11	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	131
Vegetables (brassicae)	64	14	4	8	3	7	-	-	-	-	-	-	-	-	-	-	-	-	28
Vegetables (other)	31	1	25	13	13	0	9	3	0	7	-	-	-	-	-	-	-	-	53
Soft Fruit	30	20	0	14	36	1	-	-	-	-	-	-	-	-	-	-	-	-	13
Top Fruit	72	26	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Other tillage	73	3	5	14	3	2	-	-	-	-	-	-	-	-	-	-	-	-	52
All tillage	56	5	12	17	6	2	1	-	-	-	-	-	-	-	-	-	-	-	4137
Grass under 5 years old	55	24	14	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	765
Grass 5 years and over	66	22	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2036
All grass	64	23	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2801
All crops and grass	60	14	11	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	6938

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2014

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	60	7	8	15	7	1	0	1	-	-	-	-	-	-	-	-	-	-	96
Winter wheat	55	2	9	12	12	6	1	2	-	-	-	-	-	-	-	-	-	-	1419
Spring barley	52	4	14	16	9	4	1	-	-	-	-	-	-	-	-	-	-	-	495
Winter barley	43	4	9	15	18	8	1	1	-	-	-	-	-	-	-	-	-	-	461
Oats	52	3	12	18	6	5	2	0	0	2	-	-	-	-	-	-	-	-	170
Rye/triticale/Durum wheat	53	0	0	0	3	44	-	-	-	-	-	-	-	-	-	-	-	-	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	25	0	1	9	3	4	5	4	4	4	4	14	3	13	0	2	1	4	101
Sugar beet	33	0	9	5	15	17	12	6	1	1	1	-	-	-	-	-	-	-	132
Spring oilseed rape	61	0	0	5	9	25	-	-	-	-	-	-	-	-	-	-	-	-	9
Winter oilseed rape	63	1	9	12	10	5	0	1	-	-	-	-	-	-	-	-	-	-	498
Linseed	59	3	3	25	3	0	0	7	-	-	-	-	-	-	-	-	-	-	29
Forage maize	65	4	8	5	9	2	1	3	3	0	1	-	-	-	-	-	-	-	214
Rootcrops for stockfeed	21	3	21	24	15	2	0	0	8	6	-	-	-	-	-	-	-	-	50
Leafy forage crops	66	10	6	0	14	4	-	-	-	-	-	-	-	-	-	-	-	-	27
Arable silage/other fodder crops	79	5	9	2	3	0	2	0	0	0	0	1	-	-	-	-	-	-	55
Peas - human consumption	71	0	1	8	14	3	0	3	-	-	-	-	-	-	-	-	-	-	40
Peas - animal consumption	71	3	8	5	8	4	-	-	-	-	-	-	-	-	-	-	-	-	26
Beans - animal consumption	78	0	3	7	9	3	-	-	-	-	-	-	-	-	-	-	-	-	131
Vegetables (brassicae)	50	12	6	0	6	3	13	10	-	-	-	-	-	-	-	-	-	-	28
Vegetables (other)	33	1	1	6	4	0	9	2	5	8	20	8	2	-	-	-	-	-	53
Soft Fruit	15	0	35	0	34	1	0	0	15	1	-	-	-	-	-	-	-	-	13
Top Fruit	23	45	0	2	4	4	0	21	-	-	-	-	-	-	-	-	-	-	22
Other tillage	80	2	0	2	3	3	0	0	10	-	-	-	-	-	-	-	-	-	52
All tillage	55	3	9	12	11	6	1	1	1	-	-	-	-	-	-	-	-	-	4137
Grass under 5 years old	51	14	15	9	6	3	1	-	-	-	-	-	-	-	-	-	-	-	765
Grass 5 years and over	65	19	11	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2036
All grass	63	18	12	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2801
All crops and grass	59	11	10	8	6	3	1	1	-	-	-	-	-	-	-	-	-	-	6938

Source: British Survey of Fertiliser Practice 2014

**Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Grazed not mown	49	31	31	19	81	21	23	40	6	7	1224
Grazed mown	73	45	47	58	105	26	40	77	12	19	1216
All grazings	58	36	37	32	92	23	31	53	8	11	2440
Cut for silage - grazed	81	51	52	68	117	26	41	95	13	21	824
Cut for silage - not grazed	87	40	46	70	139	25	50	120	10	23	231
All cut for silage	82	48	51	68	123	26	43	101	12	22	1055
Cut for hay - grazed	55	31	33	38	74	26	36	40	8	12	428
Cut for hay - not grazed	57	32	36	19	83	27	35	47	9	13	98
All cut for hay	55	31	34	35	75	26	36	42	8	12	526
All mowings	75	44	46	59	111	26	41	83	11	19	1537
All grass	60	36	37	35	97	24	33	58	8	12	2801

Source: British Survey of Fertiliser Practice 2014

**Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	51	2	15	14	7	3	3	2	1	0	0	1	-	-	-	-	-	-	1224
Grazed mown	27	2	11	16	14	7	6	6	3	2	2	1	1	-	-	-	-	-	1216
All grazings	42	2	14	15	9	4	4	4	2	1	1	1	-	-	-	-	-	-	2440
Cut for silage - grazed	19	2	8	15	16	8	8	9	4	3	3	2	1	-	-	-	-	-	824
Cut for silage - not grazed	13	1	9	12	13	7	8	11	7	7	4	5	2	0	0	2	-	-	231
All cut for silage	18	1	8	14	15	8	8	9	5	4	3	3	1	0	0	1	-	-	1055
Cut for hay - grazed	45	2	17	17	9	3	2	1	1	1	0	0	1	-	-	-	-	-	428
Cut for hay - not grazed	43	2	17	10	13	5	5	1	1	0	0	0	0	0	0	2	-	-	98
All cut for hay	45	2	17	16	9	3	3	1	1	1	0	0	1	-	-	-	-	-	526
All mowings	25	2	11	15	14	7	7	7	4	3	2	2	1	0	0	1	-	-	1537
All grass	40	2	13	14	9	5	4	4	2	1	1	1	1	-	-	-	-	-	2801

Source: British Survey of Fertiliser Practice 2014

**Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	69	21	7	2	0	1	-	-	-	-	-	-	-	-	-	-	-	-	1224
Grazed mown	55	26	14	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1216
All grazings	64	23	9	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2440
Cut for silage - grazed	49	29	16	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	824
Cut for silage - not grazed	60	24	13	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	231
All cut for silage	52	27	15	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1055
Cut for hay - grazed	69	18	8	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	428
Cut for hay - not grazed	68	14	15	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	98
All cut for hay	69	17	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	526
All mowings	56	25	14	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1537
All grass	64	23	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2801

Source: British Survey of Fertiliser Practice 2014

**Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	69	19	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1224
Grazed mown	53	18	16	7	3	2	1	-	-	-	-	-	-	-	-	-	-	-	1216
All grazings	63	19	11	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2440
Cut for silage - grazed	48	19	17	9	4	3	1	-	-	-	-	-	-	-	-	-	-	-	824
Cut for silage - not grazed	54	14	14	8	4	3	1	1	-	-	-	-	-	-	-	-	-	-	231
All cut for silage	49	17	17	9	4	3	1	-	-	-	-	-	-	-	-	-	-	-	1055
Cut for hay - grazed	67	15	11	3	3	1	0	0	0	0	0	0	0	1	-	-	-	-	428
Cut for hay - not grazed	64	13	16	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	98
All cut for hay	66	15	12	4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	526
All mowings	54	17	15	7	3	2	1	-	-	-	-	-	-	-	-	-	-	-	1537
All grass	63	18	12	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2801

Source: British Survey of Fertiliser Practice 2014



**Table EW3.0 Product use by month of application, England & Wales 2014**

**(a) Product use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	5	35	39	14	4	2	1
Straight P	18	4	4	1	0	10	29	23	4	0	0	8
Straight K	5	6	4	3	1	16	36	25	4	0	1	0
Compounds	7	4	1	1	1	4	28	30	12	6	3	3
All fertilisers	3	2	1	0	0	5	33	35	13	5	2	2

**(b) Nutrient use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	4	33	40	15	5	2	1
Phosphate	11	6	2	2	1	6	31	26	8	2	1	4
Potash	7	6	2	2	1	8	32	26	8	4	2	2
Total	3	2	1	1	0	5	32	36	13	4	2	2

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

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2014.

'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<sub>2</sub>O<sub>5</sub> and 10 kg of K<sub>2</sub>O, 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 B2.6.

**Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2014**

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	41.8	51.0	11.2	23.6	47.8	21.8	43.9	35.7	30.5	35.5	19.3	36.3	42.1
Urea	5.9	10.4	3.9	2.3	14.2	3.2	9.2	4.1	4.9	3.8	1.2	4.3	8.1
Calcium Ammonium Nitrate (CAN)	1.4	1.2	0.0	0.7	1.0	1.2	1.1	2.2	2.2	1.8	0.0	2.0	1.3
Urea Ammonium Nitrate (UAN)	11.2	11.9	0.0	4.9	13.3	3.7	10.5	1.6	2.1	1.4	51.3	2.3	8.6
Other Straight N	2.8	2.1	1.4	1.1	4.4	2.9	2.5	0.9	0.9	0.7	0.0	0.9	2.1
Triple Superphosphate (TSP)	2.4	2.5	1.7	1.0	2.4	4.2	2.5	0.6	0.8	0.6	1.1	0.6	2.1
Other Straight P	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.6	0.0	0.0	0.3	0.1
Muriate of Potash (MOP)	3.0	2.9	7.8	2.3	2.7	8.3	3.5	1.0	3.9	0.6	10.1	1.1	3.0
Other Straight K	0.2	0.2	0.0	21.8	0.1	5.8	1.6	0.1	0.0	0.2	0.0	0.1	1.3
PK	9.6	11.6	1.3	21.9	7.5	11.3	10.7	2.5	4.7	2.1	11.2	2.8	8.9
NK	2.0	1.0	1.8	1.7	0.4	4.9	1.4	5.4	3.6	9.1	0.0	5.9	2.5
Low N (<19% N)	4.5	2.2	67.1	7.5	4.6	19.6	7.6	2.5	3.4	2.1	2.4	2.5	6.4
High N (>=19% N)	15.0	2.7	3.1	2.2	0.5	10.0	4.4	42.7	42.3	41.9	3.5	40.7	12.9
Other	0.2	0.2	0.7	8.8	1.0	3.2	1.0	0.1	0.0	0.1	0.0	0.1	0.8
<b>Total product ('000 tonnes)</b>	<b>223</b>	<b>1508</b>	<b>66</b>	<b>99</b>	<b>448</b>	<b>141</b>	<b>2486</b>	<b>791</b>	<b>94</b>	<b>479</b>	<b>13</b>	<b>953</b>	<b>3440</b>

Source: British Survey of Fertiliser Practice 2014

**Table EW3.2 Use of product type by crop group, England & Wales 2014**

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	8.7	67.2	0.9	1.9	18.7	2.7	76.0	79.4	8.5	52.0	0.6	24.0	1438
Urea	4.6	64.6	1.8	1.0	26.1	1.9	89.0	78.5	13.5	53.1	0.1	11.0	319
Calcium Ammonium Nitrate (CAN)	10.0	65.1	0.0	3.6	18.0	3.3	51.8	83.7	8.5	48.1	0.0	48.2	55
Urea Ammonium Nitrate (UAN)	8.9	65.7	0.0	1.7	22.1	1.7	94.1	67.9	5.3	36.9	38.3	5.9	330
Other Straight N	8.4	48.4	2.2	1.1	34.2	5.6	82.3	74.9	14.2	34.2	0.0	17.7	61
Triple Superphosphate (TSP)	9.5	62.1	1.3	0.8	18.0	8.3	92.4	89.5	27.2	30.4	2.1	7.6	73
Other Straight P	0.0	44.9	0.0	0.0	49.3	5.8	44.2	100.0	26.7	0.0	0.0	55.8	7
Muriate of Potash (MOP)	7.6	53.8	7.1	2.1	13.6	15.8	91.6	71.6	42.0	24.2	20.1	8.4	88
Other Straight K	0.3	5.8	0.0	62.0	0.5	31.4	98.2	96.1	0.0	100.0	0.0	1.8	39
PK	9.6	66.3	0.5	6.9	11.7	4.9	90.8	81.9	8.4	30.2	5.6	9.2	283
NK	10.4	47.7	3.4	7.7	2.1	28.7	39.9	73.9	8.8	83.7	0.0	60.1	89
Low N (<19% N)	8.3	21.9	30.5	3.5	14.6	21.2	84.6	83.5	12.1	42.5	0.3	15.4	151
High N (>=19% N)	33.8	45.0	2.7	2.1	1.7	14.7	17.6	88.6	10.0	48.0	0.0	82.4	481
Other	1.9	8.2	2.6	55.9	13.3	18.0	98.5	76.3	0.0	100.0	0.0	1.5	29
<b>All Fertilisers</b>	<b>9.0</b>	<b>60.7</b>	<b>2.7</b>	<b>4.0</b>	<b>18.0</b>	<b>5.7</b>	<b>72.3</b>	<b>83.0</b>	<b>9.8</b>	<b>50.2</b>	<b>1.3</b>	<b>27.7</b>	<b>3440</b>

Source: British Survey of Fertiliser Practice 2014

**Table EW3.3 Product use by month of application, England & Wales 2014**

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	4.1	32.1	40.5	14.8	4.8	2.1	0.9	0.5	0.1	0.0	0.0	1438
Urea	0.0	6.9	41.4	34.1	12.5	2.5	1.9	0.2	0.4	0.1	0.0	0.0	319
Calcium Ammonium Nitrate (CAN)	0.0	1.3	30.7	36.0	16.8	3.7	6.1	4.9	0.6	0.0	0.0	0.0	55
Urea Ammonium Nitrate (UAN)	0.0	4.2	37.5	40.9	15.2	1.2	0.0	0.4	0.5	0.1	0.0	0.0	330
Other Straight N	0.0	5.4	58.5	19.1	11.0	2.9	2.4	0.5	0.3	0.0	0.0	0.0	61
Triple Superphosphate (TSP)	0.4	10.2	32.3	19.6	4.5	0.0	0.0	6.2	17.5	4.6	4.1	0.6	73
Other Straight P	0.0	2.6	0.0	55.8	0.0	0.0	0.0	21.8	19.9	0.0	0.0	0.0	7
Muriate of Potash (MOP)	0.3	13.2	40.7	26.0	5.4	0.5	0.8	0.1	4.3	4.1	3.0	1.8	88
Other Straight K	1.7	21.2	25.3	22.2	1.7	0.0	0.0	0.0	5.5	9.3	6.4	6.7	39
PK	1.8	6.8	26.1	12.7	4.0	0.3	0.0	4.9	23.2	13.0	3.8	3.3	283
NK	0.0	3.2	27.4	12.3	22.7	24.3	8.0	1.9	0.2	0.0	0.0	0.0	89
Low N (<19% N)	0.0	6.2	38.2	34.1	7.5	0.7	1.0	4.2	3.4	3.4	1.0	0.4	151
High N (>=19% N)	0.0	1.1	25.4	42.4	15.7	8.7	3.7	2.4	0.5	0.2	0.0	0.0	481
Other	1.2	7.6	21.2	27.5	0.8	41.6	0.0	0.0	0.0	0.0	0.1	0.0	29
<b>All Fertilisers</b>	<b>0.2</b>	<b>4.8</b>	<b>32.6</b>	<b>35.4</b>	<b>13.0</b>	<b>4.7</b>	<b>2.0</b>	<b>1.7</b>	<b>3.0</b>	<b>1.6</b>	<b>0.6</b>	<b>0.4</b>	<b>3440</b>

Source: British Survey of Fertiliser Practice 2014

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2014

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
North West	All tillage	92	41	66	50	159	46	84	147	19	55	113
	All grass	73	44	44	53	107	22	28	78	10	13	295
	All crops and grass	76	44	48	52	117	26	41	90	11	20	408
North East	All tillage	96	71	74	15	168	66	81	162	47	59	194
	All grass	43	36	36	22	80	34	40	34	12	14	208
	All crops and grass	62	49	49	20	129	51	62	79	25	30	402
Eastern	All tillage	94	42	35	11	162	62	78	152	26	27	627
	All grass	38	13	23	8	88	22	49	34	3	11	100
	All crops and grass	86	38	33	11	158	60	75	136	23	25	727
Yorkshire and the Humber	All tillage	94	44	46	21	170	68	89	161	30	41	804
	All grass	70	31	33	39	84	24	30	58	7	10	297
	All crops and grass	86	40	42	27	147	57	73	126	23	31	1101
West Midlands	All tillage	94	43	54	33	154	51	87	145	22	47	436
	All grass	69	32	35	39	100	19	30	69	6	11	268
	All crops and grass	81	37	44	36	130	37	63	106	14	28	704
East Midlands	All tillage	92	41	43	10	167	56	76	154	23	33	726
	All grass	61	31	31	30	99	27	31	60	8	9	206
	All crops and grass	83	38	40	16	153	49	65	127	19	26	932
South West	All tillage	84	50	48	38	136	54	67	113	27	32	635
	All grass	56	35	36	42	100	24	40	56	8	14	731
	All crops and grass	65	40	40	40	115	36	51	75	14	20	1366
South East	All tillage	88	39	38	18	180	56	71	159	22	27	493
	All grass	41	16	15	12	76	24	31	31	4	5	254
	All crops and grass	68	29	29	15	154	49	62	105	14	18	747
Wales	All tillage	86	45	47	55	110	39	57	94	18	27	109
	All grass	63	51	53	31	99	22	29	63	11	15	442
	All crops and grass	65	51	52	33	100	23	31	65	12	16	551

Source: British Survey of Fertiliser Practice 2014

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2014

		Crop area receiving dressing (%)				Average field rate (kg/ha)				Overall application rate (kg/ha)			Fields in sample
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O		
Wessex	All tillage	79	43	44	38	142	57	63	112	24	27	295	
	All grass	46	17	19	38	100	21	39	46	4	7	289	
	All crops and grass	59	27	29	38	122	43	53	72	12	15	584	
Anglia	All tillage	94	42	35	11	162	62	78	152	26	27	627	
	All grass	38	13	23	8	88	22	49	34	3	11	100	
	All crops and grass	86	38	33	11	158	60	75	136	23	25	727	
Northern	All tillage	95	60	68	28	152	63	77	144	37	52	197	
	All grass	65	45	44	43	98	25	30	64	11	13	394	
	All crops and grass	70	47	48	40	111	33	41	78	16	20	591	
North East	All tillage	95	48	49	22	171	67	87	162	32	43	858	
	All grass	67	33	35	36	85	27	33	57	9	12	360	
	All crops and grass	84	42	44	27	146	56	71	123	24	31	1218	
North Mercia	All tillage	95	43	66	44	150	45	88	143	19	58	227	
	All grass	70	32	35	51	111	20	31	77	7	11	197	
	All crops and grass	79	36	47	48	128	31	61	101	11	28	424	
South Mercia	All tillage	93	42	42	22	160	58	87	149	24	36	305	
	All grass	48	18	21	16	86	19	30	42	3	6	142	
	All crops and grass	75	32	33	20	141	49	72	105	16	24	447	
East Midland	All tillage	92	41	43	10	167	56	76	154	23	33	726	
	All grass	61	31	31	30	99	27	31	60	8	9	206	
	All crops and grass	83	38	40	16	153	49	65	127	19	26	932	
South East	All tillage	88	39	38	18	180	56	71	159	22	27	493	
	All grass	41	16	15	12	76	24	31	31	4	5	254	
	All crops and grass	68	29	29	15	154	49	62	105	14	18	747	
South West	All tillage	87	62	60	43	126	50	74	109	31	44	300	
	All grass	67	51	51	48	101	24	41	68	12	21	417	
	All crops and grass	72	54	53	47	108	32	50	78	17	27	717	
Wales	All tillage	86	45	47	55	110	39	57	94	18	27	109	
	All grass	63	51	53	31	99	22	29	63	11	15	442	
	All crops and grass	65	51	52	33	100	23	31	65	12	16	551	

Source: British Survey of Fertiliser Practice 2014

**Table SC1.1 Total fertiliser use, Scotland 2014**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Winter wheat	100	70	76	15	179	62	85	179	44	65	111
Spring barley	99	94	92	36	107	56	72	106	52	66	252
Winter barley	100	86	90	22	165	67	81	165	57	73	59
Oats	90	78	79	42	104	61	68	94	47	54	49
Potatoes	97	97	89	3	162	113	234	158	110	207	12
Winter oilseed rape	100	73	76	13	201	66	76	201	48	58	34
Other crops	73	61	64	41	86	59	87	63	36	55	89
All tillage	97	85	86	30	130	60	78	127	50	67	606
Grass less than five years old	84	73	75	38	121	34	47	102	25	35	281
Grass five years and over	68	57	59	19	81	20	24	55	11	14	409
All grass	72	61	63	24	93	24	31	67	15	20	690
All crops and grass	80	69	70	26	108	38	50	87	26	35	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC1.2 Use of straight fertiliser, Scotland 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Winter wheat	91	16	33	173	71	79	159	12	26	111
Spring barley	64	6	7	76	71	99	48	5	6	252
Winter barley	97	15	26	156	70	76	151	10	20	59
Oats	64	6	7	84	-	40	54	-	3	49
Potatoes	49	10	49	-	-	144	-	-	71	12
Winter oilseed rape	100	14	32	184	66	72	184	9	23	34
Other crops	26	2	9	90	-	103	24	-	10	89
All tillage	71	9	15	117	69	86	83	6	13	606
Grass less than five years old	29	1	3	106	28	86	30	0	3	281
Grass five years and over	19	0	1	74	-	51	14	-	0	409
All grass	21	1	2	85	27	71	18	0	1	690
All crops and grass	37	3	6	105	64	83	39	2	5	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC1.3 Use of compound fertiliser, Scotland 2014**

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Winter wheat	26	54	52	80	60	74	21	32	39	111
Spring barley	87	88	86	67	55	70	58	48	60	252
Winter barley	37	71	71	38	67	74	14	47	53	59
Oats	53	72	72	76	61	70	40	44	51	49
Potatoes	97	97	79	101	106	173	98	103	136	12
Winter oilseed rape	57	60	47	29	65	73	17	39	34	34
Other crops	58	59	55	69	60	84	40	35	46	89
All tillage	66	76	73	66	58	73	44	44	54	606
Grass less than five years old	74	72	73	97	34	45	72	25	32	281
Grass five years and over	58	57	58	71	20	23	41	11	14	409
All grass	62	61	62	79	24	30	49	15	19	690
All crops and grass	63	66	66	75	37	46	47	24	30	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC1.4 Use of lime, Scotland 2014**

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)						Fields limed	Fields in sample
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All		
Winter wheat	6.1	0.1	6.2	-	2.6	15.0	4.4	5.0	5.0	-	4.5	4.7	17	111
Spring barley	15.4	0.1	4.7	-	3.8	23.9	5.0	5.0	5.1	-	0.3	4.2	64	252
Winter barley	9.3	0.5	-	-	4.2	13.9	3.6	5.0	-	-	1.0	2.9	10	59
Oats	9.2	-	9.6	-	0.2	19.0	4.0	-	5.0	-	0.2	4.5	9	49
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	12
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	34
Other crops	15.4	-	5.6	-	5.6	26.6	5.1	-	4.4	-	1.8	4.3	24	89
All tillage	11.9	0.1	4.8	-	3.4	20.3	4.8	5.0	5.1	-	1.1	4.3	128	606
Grass less than five years old	5.2	-	1.6	-	1.7	8.5	4.8	-	4.9	-	2.7	4.4	32	281
Grass five years and over	0.8	-	0.6	-	1.1	2.5	4.1	-	5.0	-	0.8	2.8	23	409
All grass	1.9	-	0.8	-	1.2	4.0	4.6	-	5.0	-	1.5	3.7	55	690
All crops and grass	5.2	0.0	2.1	-	2.0	9.3	4.8	5.0	5.1	-	1.3	4.1	183	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Winter wheat	0	0	1	2	7	3	5	19	22	27	12	1	-	-	-	-	-	-	111
Spring barley	1	0	3	10	18	48	15	2	1	2	-	-	-	-	-	-	-	-	252
Winter barley	0	0	1	0	3	6	9	48	23	8	2	-	-	-	-	-	-	-	59
Oats	10	0	0	9	32	31	16	1	-	-	-	-	-	-	-	-	-	-	49
Potatoes	3	0	0	4	15	18	0	10	17	3	29	-	-	-	-	-	-	-	12
Winter oilseed rape	0	0	0	0	0	1	1	17	41	20	14	5	-	-	-	-	-	-	34
Other crops	27	10	10	14	10	13	7	5	3	2	1	-	-	-	-	-	-	-	89
All tillage	3	1	2	7	14	30	11	10	9	8	4	-	-	-	-	-	-	-	606
Grass less than five years old	16	1	6	12	15	15	11	10	3	4	5	2	-	-	-	-	-	-	281
Grass five years and over	32	0	13	27	11	8	4	2	1	1	1	0	0	0	1	-	-	-	409
All grass	28	0	11	23	12	9	6	4	2	2	2	1	0	0	1	-	-	-	690
All crops and grass	20	1	8	18	13	16	7	6	4	4	2	1	-	-	-	-	-	-	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Winter wheat	30	7	8	34	20	2	-	-	-	-	-	-	-	-	-	-	-	-	111
Spring barley	6	3	34	37	19	1	-	-	-	-	-	-	-	-	-	-	-	-	252
Winter barley	14	1	10	44	25	5	-	-	-	-	-	-	-	-	-	-	-	-	59
Oats	22	1	11	51	16	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Potatoes	3	0	0	40	18	14	0	4	12	0	0	0	10	-	-	-	-	-	12
Winter oilseed rape	27	0	12	35	25	1	-	-	-	-	-	-	-	-	-	-	-	-	34
Other crops	39	5	31	11	4	3	5	0	1	1	-	-	-	-	-	-	-	-	89
All tillage	15	3	24	36	19	2	-	-	-	-	-	-	-	-	-	-	-	-	606
Grass less than five years old	27	26	33	10	2	2	-	-	-	-	-	-	-	-	-	-	-	-	281
Grass five years and over	43	40	14	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	409
All grass	39	37	19	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	690
All crops and grass	31	26	21	14	7	1	-	-	-	-	-	-	-	-	-	-	-	-	1296

Source: British Survey of Fertiliser Practice 2014



**Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Winter wheat	24	2	8	17	25	16	6	2	-	-	-	-	-	-	-	-	-	-	111
Spring barley	8	1	19	28	29	13	3	-	-	-	-	-	-	-	-	-	-	-	252
Winter barley	10	1	10	22	34	21	2	-	-	-	-	-	-	-	-	-	-	-	59
Oats	21	1	9	42	23	4	-	-	-	-	-	-	-	-	-	-	-	-	49
Potatoes	11	0	0	0	10	4	7	8	0	0	5	12	3	40	-	-	-	-	12
Winter oilseed rape	24	0	8	29	19	18	2	-	-	-	-	-	-	-	-	-	-	-	34
Other crops	36	4	17	18	5	4	1	9	1	2	4	-	-	-	-	-	-	-	89
All tillage	14	1	15	25	26	13	3	1	0	0	0	0	0	1	-	-	-	-	606
Grass less than five years old	25	22	25	13	6	6	1	1	-	-	-	-	-	-	-	-	-	-	281
Grass five years and over	41	38	15	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	409
All grass	37	33	18	6	3	2	-	-	-	-	-	-	-	-	-	-	-	-	690
All crops and grass	30	23	17	12	10	6	1	-	-	-	-	-	-	-	-	-	-	-	1296

Source: British Survey of Fertiliser Practice 2014

**Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2013**

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FYM	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Grazed not mow n	60	50	51	13	74	18	18	44	9	9	353
Grazed mow n	95	82	81	38	116	32	46	110	26	37	146
All grazings	67	56	56	18	85	22	25	57	12	14	499
Cut for silage - grazed	95	82	81	40	123	34	50	117	27	40	122
Cut for silage - not grazed	95	73	78	65	138	36	55	130	26	43	159
All cut for silage	95	77	79	53	131	35	52	124	27	42	281
Cut for hay - grazed	93	87	83	27	86	25	33	80	22	27	27
Cut for hay - not grazed	77	67	61	34	94	33	55	72	22	33	39
All cut for hay	86	78	73	31	89	28	42	76	22	30	66
All mow ings	93	77	78	49	125	34	50	116	26	39	342
All grass	71	59	59	25	96	24	31	68	14	19	700

Source: British Survey of Fertiliser Practice 2013

**Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2014**

row %	kg/ha																	Fields in sample	
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-		400+
Grazed not mown	35	0	15	29	9	6	2	2	1	0	1	0	0	0	1	-	-	-	360
Grazed mown	8	0	4	13	16	19	16	10	3	6	2	1	-	-	-	-	-	-	137
All grazings	30	0	13	26	11	8	5	3	1	1	1	-	-	-	-	-	-	-	497
Cut for silage - grazed	7	0	3	12	13	19	18	12	4	7	3	2	-	-	-	-	-	-	117
Cut for silage - not grazed	12	1	4	10	17	18	11	7	3	6	8	2	0	0	1	-	-	-	153
All cut for silage	10	0	3	11	15	19	15	9	3	7	5	2	0	0	1	-	-	-	270
Cut for hay - grazed	12	0	10	30	34	12	1	-	-	-	-	-	-	-	-	-	-	-	22
Cut for hay - not grazed	20	0	10	20	24	13	6	5	0	0	0	0	0	0	2	-	-	-	41
All cut for hay	16	0	10	25	29	13	4	3	0	0	0	0	0	0	1	-	-	-	63
All mowings	11	0	4	12	17	18	13	9	3	6	4	2	0	0	1	-	-	-	327
All grass	28	0	11	23	12	9	6	4	2	2	2	1	0	0	1	-	-	-	690

Source: British Survey of Fertiliser Practice 2014

**Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2014**

row %	kg/ha																	Fields in sample	
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-		400+
Grazed not mown	47	41	9	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	360
Grazed mown	12	33	39	11	2	3	-	-	-	-	-	-	-	-	-	-	-	-	137
All grazings	40	40	15	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	497
Cut for silage - grazed	10	32	39	13	2	4	-	-	-	-	-	-	-	-	-	-	-	-	117
Cut for silage - not grazed	29	19	42	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	153
All cut for silage	20	26	41	10	2	2	-	-	-	-	-	-	-	-	-	-	-	-	270
Cut for hay - grazed	18	45	29	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Cut for hay - not grazed	29	20	37	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	41
All cut for hay	24	33	33	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	63
All mowings	20	27	40	10	2	2	-	-	-	-	-	-	-	-	-	-	-	-	327
All grass	39	37	19	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	690

Source: British Survey of Fertiliser Practice 2014

**Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2014**

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	46	40	10	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	360
Grazed mown	14	25	36	11	3	10	1	1	-	-	-	-	-	-	-	-	-	-	137
All grazings	40	37	15	4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	497
Cut for silage - grazed	12	25	34	13	3	11	1	1	-	-	-	-	-	-	-	-	-	-	117
Cut for silage - not grazed	20	14	36	14	9	3	1	0	2	0	1	-	-	-	-	-	-	-	153
All cut for silage	16	20	35	13	6	7	1	1	1	-	-	-	-	-	-	-	-	-	270
Cut for hay - grazed	18	32	42	1	0	7	-	-	-	-	-	-	-	-	-	-	-	-	22
Cut for hay - not grazed	27	16	37	18	3	-	-	-	-	-	-	-	-	-	-	-	-	-	41
All cut for hay	22	24	39	10	2	4	-	-	-	-	-	-	-	-	-	-	-	-	63
All mowings	18	20	35	13	6	6	1	1	1	-	-	-	-	-	-	-	-	-	327
All grass	37	33	18	6	3	2	-	-	-	-	-	-	-	-	-	-	-	-	690

Source: British Survey of Fertiliser Practice 2014

**Table SC3.0 Product use by month of application, Scotland 2014**

**(a) Product use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	1	0	0	1	22	45	24	4	1	1
Straight P	0	10	0	0	0	10	28	51	1	0	0	0
Straight K	4	0	0	0	0	17	33	37	3	3	1	2
Compounds	2	1	0	0	0	0	19	48	18	7	4	2
All fertilisers	1	1	0	0	0	1	20	47	19	6	3	2

**(b) Nutrient use**

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	0	0	1	0	0	0	17	48	22	7	3	2
Phosphate	3	4	0	0	0	1	27	44	12	4	2	3
Potash	3	2	0	0	0	2	27	42	13	5	2	2
Total	2	1	0	0	0	1	21	46	18	6	3	2

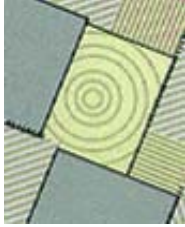
Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2014.

'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<sub>2</sub>O<sub>5</sub> and 10 kg of K<sub>2</sub>O, 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 B2.6.



## SECTION D

### USE OF ORGANIC MANURES – GREAT BRITAIN, 2014

#### 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 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 1,363 farms in the survey, around 66% (931) 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, 2014**

	<i>none</i>	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other farm</i>	<i>bio-solids</i>	<i>other non-farm</i>	<i>total with manure</i>
Farms in sample	432	733	228	32	15	34	36	48	12	39	26	931
Farms in population	32,228	48,683	14,651	1,846	789	1,442	1,342	3,734	782	1,503	1,315	61,209
Farms in population %	34%	52%	16%	2%	1%	2%	1%	4%	1%	2%	1%	66%
Volume (Mt; Mm <sup>3</sup> )	n/a	39.0	45.1	1.2	2.0	0.6	0.5	1.0	1.7	2.2	1.6	95.1
Volume %	n/a	41%	47%	1%	2%	1%	1%	1%	2%	2%	2%	100%

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

**Table D1.1b Percentage (%) of farms using each type of manure in Great Britain, 2010 - 2014**

	<i>none</i>	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other</i>
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
2013	35	51	17	2	1	3	2	5	4
2014	34	52	16	2	1	2	1	4	4

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 1% since 2010, whereas the use of cattle slurry is more consistent over the period and used on 16% of farms in 2014.



**Table D1.1c Dressing cover of organic manure in Great Britain, 2010 - 2014**

	<i>all tillage</i>	<i>grass 5 years and over</i>	<i>grass under 5 years old</i>
2010	21	33	46
2011	22	32	47
2012	23	32	47
2013	23	35	47
2014	22	29	49

Dressing covers of organic manure had increased gradually over the 5 year period. In 2014 22% of the tillage area received a dressing, with higher percentages on both categories of grass.

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.

The number and percentage of farms using each type of slurry application method in Great Britain are shown in Table 1.2. 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 D1.2 Number and percentage (%) of farms using each type of application method by slurry type, Great Britain 2014**

	<i>percentage of farms</i>								
	<i>farms in sample</i>	<i>farms in population</i>	<i>broadcast</i>	<i>band spread</i>	<i>shallow injection</i>	<i>deep injection</i>	<i>rain gun</i>	<i>rotating boom</i>	<i>non-broadcast</i>
Cattle slurry	228	14,651	80	14	8	3	1	1	25
Pig slurry	15	789	84	9	6	0	0	0	11
Grand Total	243	15,440	80	14	8	3	1	1	24

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.

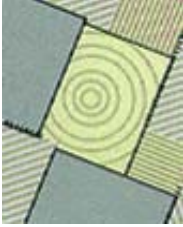


Table D1.3 gives estimates of the volume and area of manure/slurry incorporation on tillage fields by manure type and immediacy of incorporation. Farmyard manure is the most extensively incorporated at 95% of the volume with 86% of it incorporated within a week of spreading on tillage fields. Cattle and pig slurries are less likely to be incorporated with 34% and 54% 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 D1.3 Percentage (%) of organic manure incorporated (volume and area) on tillage fields by incorporation time and manure/slurry type, Great Britain 2014**

	<i>incorporation time after spreading</i>										<i>total</i>	
	<i>not incorporated</i>		<i>within 6 hours</i>		<i>between 6 and 24 hours</i>		<i>between 1 and 7 days</i>		<i>more than 1 week</i>		<i>applied area</i>	<i>volume applied</i>
	<i>%area</i>	<i>%vol</i>	<i>%area</i>	<i>%vol</i>	<i>%area</i>	<i>%vol</i>	<i>%area</i>	<i>%vol</i>	<i>%area</i>	<i>%vol</i>	<i>'000 ha</i>	<i>'Mt; Mm<sup>3</sup></i>
FYM	5	5	13	13	29	28	43	45	10	9	761	18.0
Cattle slurry	35	34	10	12	12	12	23	24	20	18	128	4.4
Pig slurry	50	54	22	19	19	16	8	11	0	0	56	1.8
Poultry FYM	7	4	15	15	60	63	16	16	2	3	123	1.0
Other	13	15	24	24	45	44	13	15	5	1	149	3.5
Total	11	14	15	14	32	28	33	35	9	9	1,216	28.7

Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor (Table D1.4a). The percentage of farmers using a contractor to spread at least some of their FYM was 36% in 2014. Where contractors were used they were applying between 79% and 89% of the manure on average.

**Table D1.4a Use of contractors to spread manure/slurry in current season, Great Britain 2014**

	<i>% of farms using a contractor</i>	<i>% volume applied by contractor</i>	<i>average % of contractor-applied manure, where contractor is used</i>
FYM	39	45	89
Cattle slurry	32	29	86
Other	56	50	79
Total	36	39	87

Use of contractors to spread manures is fairly consistent over the 5 year period 2010-2014, on 28-36% of farms (Table 1.4b), as was the average amount spread, at 84-88%.

**Table D1.4b Use of contractors to spread manure/slurry, Great Britain 2010 - 2014**

	<i>% of farms using a contractor</i>	<i>% volume applied by contractor</i>	<i>average % of contractor-applied manure, where contractor is used</i>
2010	29	27	84
2011	28	29	86
2012	32	32	84
2013	30	30	88
2014	36	39	87

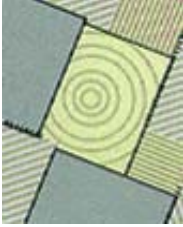


## D2 USE OF ORGANIC MANURES

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 2010 - 2014**

	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer hen manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other farm</i>	<i>biosolids</i>	<i>other non-farm</i>
2010	16	9	1	0	1	1	1	0	1	0
2011	15	8	0	0	1	1	1	0	1	1
2012	15	10	1	1	1	1	1	0	2	1
2013	16	9	1	1	1	1	1	0	1	0
2014	16	8	1	1	1	1	1	0	1	0

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

**Table D2.1b Percentage (%) distribution of each organic manure type on manured sown area, Great Britain 2010 – 2014**

	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer hen manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other farm</i>	<i>biosolids</i>	<i>other non-farm</i>
2010	58	32	3	1	2	3	2	1	4	2
2011	56	30	2	1	2	3	3	1	4	3
2012	51	34	2	2	3	3	4	1	5	2
2013	56	31	2	2	3	3	4	1	4	2
2014	59	30	2	2	3	2	3	1	4	2

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

The percentage of the sown area receiving an application of cattle FYM in 2014 was 16%, which is consistent over the five year period. Cattle FYM and cattle slurry were applied to 89% 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<sup>13</sup>**

	<i>dry matter (%)</i>	<i>total N (kg/t; kg/m<sup>3</sup>)</i>	<i>total P<sub>2</sub>O<sub>5</sub> (kg/t; kg/m<sup>3</sup>)</i>	<i>total K<sub>2</sub>O (kg/t; kg/m<sup>3</sup>)</i>
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

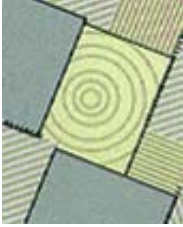
In Table D2.3, crops receiving manure applications have been classified as either “winter sown”, “spring sown” or “grass” and their average treated areas and manure application rates shown.

**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 2014**

	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other farm manure</i>	<i>bio-solids</i>	<i>other non-farm</i>
<b>Winter sown</b>										
Treated area %	9.6	1.6	1.2	1.5	1.2	1.4	0.1	-	2.4	0.8
Treated area (ha)	293,748	48,991	35,323	45,426	37,423	42,663	4,467	-	74,791	25,318
Avg manure rate (t; m <sup>3</sup> /ha)	23	35	18	31	8	8	12	-	22	30
Volume (Mt; Mm <sup>3</sup> )	6.9	1.7	0.6	1.4	0.3	0.3	0.1	-	1.6	0.8
Fields in sample	353	53	26	21	34	39	8	4	50	23
<b>Spring sown</b>										
Treated area %	26.1	5.3	1.7	0.7	1.7	1.1	0.5	-	1.3	1.2
Treated area (ha)	387,958	78,598	25,700	10,218	25,422	15,838	7,342	-	19,415	17,973
Avg manure rate (t; m <sup>3</sup> /ha)	25	33	21	33	9	7	26	-	20	26
Volume (Mt; Mm <sup>3</sup> )	9.6	2.6	0.5	0.3	0.2	0.1	0.2	-	0.4	0.5
Fields in sample	512	88	26	12	25	25	10	4	15	26
<b>Grass</b>										
Treated area %	23.1	24.5	-	0.3	0.4	-	1.1	0.7	-	0.3
Treated area (ha)	1,297,087	1,377,212	-	14,509	20,277	-	61,379	38,066	-	17,617
Avg manure rate (t; m <sup>3</sup> /ha)	17	30	-	16	6	-	13	40	-	21
Volume (Mt; Mm <sup>3</sup> )	22.3	40.7	-	0.2	0.1	-	0.8	1.5	-	0.4
Fields in sample	734	481	4	16	14	2	40	17	4	19

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

<sup>13</sup> Anon. (2010). *Fertiliser Manual (RB209)*, Defra, 8th edition. The Stationery Office, London.



The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure within the farm on which it is produced. Conversely, non-farm manures such as biosolids appear to be favoured on winter sown tillage land. The profile of the % treated area and average manure rates are broadly similar to those reported for 2013.

**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 2014**

<b>Cattle FYM</b>	<i>Cereals</i>	<i>Dairy</i>	<i>General cropping</i>	<i>Mixed</i>	<i>Other livestock</i>	<i>All farm types</i>
<b>Winter sown</b>						
Treated area %	23.2	12.8	6.0	35.2	20.8	100.0
Treated area (ha)	68,005	37,584	17,676	103,341	61,078	293,748
Avg manure rate (t; m <sup>3</sup> /ha)	25	24	22	22	24	23
Volume (Mt; Mm <sup>3</sup> )	1.7	0.9	0.4	2.3	1.4	6.9
Fields in sample	83	53	24	118	73	353
<b>Spring sown</b>						
Treated area %	16.5	26.3	10.8	25.8	20.2	100.0
Treated area (ha)	63,863	101,900	41,781	99,986	78,351	387,958
Avg manure rate (t; m <sup>3</sup> /ha)	21	27	25	24	25	25
Volume (Mt; Mm <sup>3</sup> )	1.3	2.7	1.1	2.4	2.0	9.6
Fields in sample	46	134	62	115	153	512
<b>Grass</b>						
Treated area %	0.5	23.0	1.8	6.9	67.8	100.0
Treated area (ha)	5,906	298,472	23,530	89,311	879,869	1,297,087
Avg manure rate (t; m <sup>3</sup> /ha)	14	20	20	18	16	17
Volume (Mt; Mm <sup>3</sup> )	0.1	6.1	0.5	1.6	14.0	22.3
Fields in sample	8	122	12	58	534	734

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.

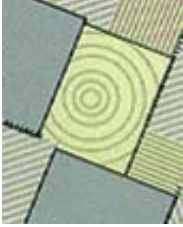
Table 2.3b shows a breakdown of the cattle FYM applications by robust farm type. Mixed farms have the most extensive treatments of cattle FYM on winter sown crops at 35.2% of the treated area. On grass 67.8% of the treated area (with cattle FYM) is on Other Livestock robust classification farms.



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. The percentage of pig slurry applied as a top-dressing to winter-sown crops in the spring is of note, with the 2014 figure of 49% being the highest proportion recorded to date in the Survey.

**Table D2.4 Percentage (%) of each organic manure type applied, by sowing season and timing, Great Britain 2014**

	<i>cattle FYM</i>	<i>cattle slurry</i>	<i>pig FYM</i>	<i>pig slurry</i>	<i>layer manure</i>	<i>broiler/turkey litter</i>	<i>other FYM</i>	<i>other farm manure</i>	<i>bio-solids</i>	<i>other non-farm</i>
<b>Winter sown</b>										
August	3	0	11	10	22	25	1	0	34	6
September	9	1	39	0	19	35	5	7	36	7
October	2	1	5	6	3	0	0	0	4	5
Winter (Nov, Dec, Jan)	0	0	0	0	0	0	0	0	0	0
Spring (Feb, Mar, Apr)	0	1	0	49	1	9	0	0	0	19
Summer (May, Jun, Jul)	0	0	0	0	0	3	0	0	0	0
<b>Spring sown</b>										
August	0	0	0	0	1	0	0	0	1	0
September	0	0	3	0	5	0	1	0	0	0
October	1	0	6	0	1	1	6	0	1	0
Winter (Nov, Dec, Jan)	3	1	0	0	0	0	0	0	4	3
Spring (Feb, Mar, Apr)	15	4	32	14	19	25	3	13	13	27
Summer (May, Jun, Jul)	1	0	0	0	5	1	0	0	0	3
<b>Grass</b>										
August	4	5	0	0	0	0	2	2	0	4
September	5	5	0	1	0	0	5	0	0	0
October	3	3	0	0	0	0	1	0	1	0
Winter (Nov, Dec, Jan)	9	9	0	0	0	0	2	13	0	0
Spring (Feb, Mar, Apr)	33	44	4	13	16	1	41	14	7	22
Summer (May, Jun, Jul)	11	25	0	7	8	0	33	50	0	4
<b>% of total treated area</b>	50	35	2	2	2	2	2	1	3	1



### 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<sup>14</sup>. 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, 2014**

dressing cover (%)	nitrogen		phosphate		potash		fields in sample	
	with manure	without manure	with manure	without manure	with manure	without manure	with manure	without manure
Winter wheat	99	100	26	50	33	50	318	1,188
Spring barley	99	100	75	66	75	68	214	501
Winter barley	99	100	40	57	45	65	120	395
Potatoes (maincrop)	87	100	66	84	67	85	37	69
Sugar beet	96	100	14	51	67	67	51	81
Winter oilseed rape	99	100	19	49	25	42	96	435
average field rate (kg/ha)	nitrogen		phosphate		potash		fields in sample	
	with manure	without manure	with manure	without manure	with manure	without manure	with manure	without manure
Winter wheat	169	192	61	59	81	74	318	1,188
Spring barley	101	113	48	55	61	70	214	501
Winter barley	139	147	55	59	68	75	120	395
Potatoes (maincrop)	156	149	124	119	228	225	37	69
Sugar beet	93	101	47	64	93	113	51	81
Winter oilseed rape	177	195	58	59	82	68	96	435
overall application rate (kg/ha)	nitrogen		phosphate		potash		fields in sample	
	with manure	without manure	with manure	without manure	with manure	without manure	with manure	without manure
Winter wheat	167	192	16	29	27	36	318	1,188
Spring barley	100	113	36	37	46	48	214	501
Winter barley	137	147	22	34	31	48	120	395
Potatoes (maincrop)	137	149	82	100	152	191	37	69
Sugar beet	89	101	7	33	62	75	51	81
Winter oilseed rape	175	195	11	29	20	28	96	435

<sup>14</sup> Anon. (2010). *Fertiliser Manual (RB209)*, Defra, 8<sup>th</sup> edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the Defra web site

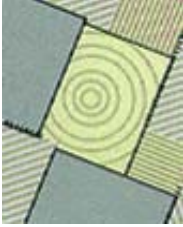


For all the major tillage crops the overall rate of nitrogen from manufactured mineral fertiliser is higher on fields where organic manures were not applied. Application rate increases of nitrogen ranged from 10 kg/ha for winter barley to 25 kg/ha on winter wheat, although the fact that the data derive from fewer fields should be taken into account. This is also predominantly the case for phosphate and potash fertiliser application rates. This is most dramatically illustrated by a 79% decrease in the application rate of phosphate on manured sugar beet fields. This decrease was mainly caused by a reduction in dressing cover with only 14% of manured sugar beet 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, 2010 - 2014**

<i>nitrogen (kg/ha)</i>	2010		2011		2012		2013		2014	
	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>
Winter wheat	187	197	179	198	170	190	175	187	167	192
Spring barley	91	108	97	107	95	105	96	113	100	113
Winter barley	138	146	137	144	140	145	141	145	137	147
Potatoes (maincrop)	139	138	146	178	133	136	183	167	137	149
Sugar beet	87	96	81	99	89	99	87	103	89	101
Winter oilseed rape	175	204	174	203	166	191	161	187	175	195
<i>phosphate (kg/ha)</i>	2010		2011		2012		2013		2014	
	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>
Winter wheat	16	29	15	32	13	29	16	29	16	29
Spring barley	35	36	37	35	32	36	28	32	36	37
Winter barley	26	35	24	32	18	33	26	28	22	34
Potatoes (maincrop)	99	135	122	119	108	104	119	126	82	100
Sugar beet	11	38	10	36	13	31	15	34	7	33
Winter oilseed rape	10	33	10	30	8	28	21	28	11	29
<i>potash (kg/ha)</i>	2010		2011		2012		2013		2014	
	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>	<i>with manure</i>	<i>without manure</i>
Winter wheat	26	32	30	34	21	33	22	34	27	36
Spring barley	45	50	47	47	42	51	40	48	46	48
Winter barley	36	50	34	49	27	44	36	43	31	48
Potatoes (maincrop)	163	230	199	213	183	208	203	249	152	191
Sugar beet	88	73	50	93	65	73	72	76	62	75
Winter oilseed rape	17	32	15	29	11	30	15	30	20	28

Differences in overall application rates with and without manures for nitrogen, phosphate and potash for the period 2010 to 2014 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 and 2013. The increased rates are most consistent for nitrogen on winter oilseed rape at between 10% and 14% 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 2014**

	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
<b>Cereals</b>								
Grass under 5 years old *	140	112	19	39	98	65	10	84
Grass 5 years and over *	97	72	13	27	35	38	6	239
All grass	132	86	18	31	77	48	16	323
<b>Dairy</b>								
Grass under 5 years old	176	141	27	28	54	59	144	58
Grass 5 years and over	145	134	24	22	46	26	222	151
All grass	156	136	25	23	49	34	366	209
<b>General cropping</b>								
Grass under 5 years old *	90	99	29	37	31	63	11	58
Grass 5 years and over *	104	72	22	24	33	36	13	145
All grass	99	80	25	28	32	45	24	203
<b>Mixed</b>								
Grass under 5 years old *	123	113	27	35	47	54	52	145
Grass 5 years and over *	88	83	26	24	32	28	41	260
All grass	104	93	27	28	40	37	93	405
<b>Other livestock</b>								
Grass under 5 years old	122	90	32	27	46	35	196	208
Grass 5 years and over	82	61	23	20	26	21	474	715
All grass	91	65	25	21	31	23	670	923
<b>All farm types</b>								
Grass under 5 years old	145	107	30	32	49	48	415	553
Grass 5 years and over	106	74	23	21	32	24	761	1513
All grass	118	81	25	23	37	29	1176	2066

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 (typically fewer than 36 fields).

When looking at all farm types taken together, the rates of nitrogen, phosphate and potash fertiliser were usually 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. Nitrogen rates were significantly higher on dairy farms but more comparable on other farm types except “other” livestock farms where rates were lower. This indicates that dairy farmers are intensive grass growers looking for high yields. For phosphate and potash rates were comparable across all farm types except “other livestock” farms where rates were lower also.

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).





All grazing land also receives manure, it is just that it is not applied as a dressing in our context.

**Table D3.3a Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2014**

	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	114	255	20	22	43	54	26	13
All cut for silage	164	148	26	26	55	53	238	69
All grazings	150	134	25	23	43	34	282	186

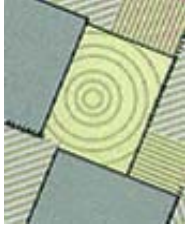
Application rates of mineral fertilisers are consistently higher for grass to be cut for silage. No clear pattern has emerged when comparing rates with and without manure, indicating that rates are more likely to be influenced by the grass production requirements.

**Table D3.3b Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2010 – 2014**

<i>all cut for hay</i>	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
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
2013	103	124	15	19	27	21	20	18
2014	114	255	20	22	43	54	26	13
<i>all cut for silage</i>	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
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
2013	161	146	28	30	50	47	260	71
2014	164	148	26	26	55	53	238	69
<i>all grazings</i>	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
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
2013	141	124	24	24	40	32	313	195
2014	150	134	25	23	43	34	282	186

Mineral fertiliser application rates of nitrogen are variable over the 5 year period 2010-14 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 26-27 kg/ha for fields cut for silage and 24-27 kg/ha on all grazed fields. Potash average field rates for manured silage and grazed grass were in the range 47-55 kg/ha and 38-43 kg/ha respectively.





## SECTION E

### E1 SPREADING PRECISION, RECORD KEEPING, NUTRIENT MANAGEMENT PLANS

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 2014, 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 E1.1). Farmers checking more frequently than this total 4%, checking at each change of fertiliser. Twenty five percent of farmers never check their spreaders for accuracy.

**Table E1.1 Frequency of spread pattern checks using catch trays, percentage (%) of those farms with a spreader, Great Britain 2010 - 2014**

	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
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
2013	10	8	4	11	39	26	11	2
2014	10	8	4	11	37	25	14	1

Practices of checking are generally consistent over the five year period 2010-2014, with contractors used on 12% of farms on average over this time.

**Table E1.2a Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2013/14 crop year, Great Britain 2014**

	manufactured fertilisers				organic manures			
	farms	farms %	area (ha)	area %	farms	farms %	area (ha)	area %
Computer program	15,320	20.6	2,933,344	33.0	7,057	16.5	1,460,983	28.2
Farm diary	37,397	50.2	3,830,168	43.1	23,623	55.4	2,534,332	49.0
Farm notebook/pocketbook	18,328	24.6	1,900,751	21.4	8,526	20.0	959,065	18.5
File record sheet (file in the office)	14,033	18.8	1,782,164	20.0	8,400	19.7	1,048,970	20.3
Other paper record	3,173	4.3	273,046	3.1	2,159	5.1	226,330	4.4
No records kept	4,018	5.1	249,217	2.7	5,489	11.4	428,440	7.6

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 E1.2a). Computers were used for recording fertiliser applications on 21% of farms, but this equates to 33% in area terms. No records were kept on 5% of farms, and this falls to 3% when considered on an area basis. Computerised record keeping is slightly less common for organic manures at 17% of farms.

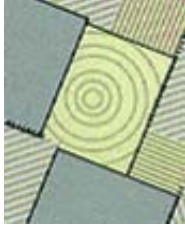
Table E1.2b shows the approach to record keeping on different types of farms. For manufactured fertilisers use of computers is highest on cereal farms at 41%, and lowest, at less than 15% on dairy and other livestock farms, where a higher proportion use farm diaries. Farms of all types favour diaries for recording applications of organic manures. The method of record keeping for all the different farm types is broadly similar for both manufactured and organic fertilisers.



**Table E1.2b Record keeping methods for fertiliser and manure applications on farms where each nutrient type was applied during the 2013/14 crop year, by farm type, Great Britain 2014**

<i>Cereals</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	6,568	40.5	2,083	44.4
Farm diary	6,316	38.9	2,013	42.9
Farm notebook/pocketbook	2,803	17.3	571	12.2
File record sheet (file in the office)	4,306	26.5	1,023	21.8
Other paper record	478	2.9	72	1.5
No records kept	0	0.0	205	4.2
<i>Dairy</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	1,448	15.3	983	13.5
Farm diary	5,150	54.3	4,256	58.3
Farm notebook/pocketbook	2,349	24.8	1,667	22.8
File record sheet (file in the office)	1,858	19.6	1,570	21.5
Other paper record	58	0.6	58	0.8
No records kept	382	3.9	827	10.2
<i>General cropping</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	3,158	31.4	1,221	36.3
Farm diary	4,409	43.9	1,271	37.8
Farm notebook/pocketbook	2,750	27.4	933	27.7
File record sheet (file in the office)	2,220	22.1	658	19.6
Other paper record	231	2.3	181	5.4
No records kept	187	1.8	187	5.3
<i>Mixed</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	2,389	21.9	1,590	22.4
Farm diary	5,129	47.1	3,207	45.1
Farm notebook/pocketbook	2,189	20.1	800	11.3
File record sheet (file in the office)	2,630	24.2	2,365	33.3
Other paper record	1,406	12.9	802	11.3
No records kept	290	2.6	349	4.7
<i>Other livestock</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	1,492	5.4	995	5.0
Farm diary	16,347	59.7	12,725	63.8
Farm notebook/pocketbook	8,067	29.5	4,534	22.7
File record sheet (file in the office)	2,974	10.9	2,762	13.8
Other paper record	1,001	3.7	1,046	5.2
No records kept	3,160	10.3	3,921	16.4
<i>All farm types</i>	<i>manufactured fertilisers</i>		<i>organic manures</i>	
	<i>farms</i>	<i>farms %</i>	<i>farms</i>	<i>farms %</i>
Computer program	15,320	20.6	7,057	16.5
Farm diary	37,397	50.2	23,623	55.4
Farm notebook/pocketbook	18,328	24.6	8,526	20.0
File record sheet (file in the office)	14,033	18.8	8,400	19.7
Other paper record	3,173	4.3	2,159	5.1
No records kept	4,018	5.1	5,489	11.4

Note: more than one method may be used



**Table E1.2c 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 2010-2014**

		<i>computer program</i>	<i>farm diary</i>	<i>farm notebook/pocket-book</i>	<i>file record sheet (file in the office)</i>	<i>other paper record</i>	<i>no records kept</i>
manufactured fertilisers	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
	2013	21.2	49.2	23.6	19.8	2.8	5.7
	2014	20.6	50.2	24.6	18.8	4.3	5.1
organic manures	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
	2013	18.0	51.9	22.0	18.9	2.6	9.9
	2014	16.5	55.4	20.0	19.7	5.1	11.4

Note: more than one method may be used

Recording methods for manufactured fertilisers show minor variations across the five year period 2010-14 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.

**Table E1.3 Nutrient management plans percentage (%) of farms and area for arable and grass, Great Britain 2014**

	<i>arable</i>		<i>grass</i>	
	<i>farms %</i>	<i>area %</i>	<i>farms %</i>	<i>area %</i>
Yes - purpose built toolkit	39.4	59.1	15.3	15.9
Yes - own calculations	17.5	17.9	13.2	16.5
No specific calculations/usual practice	42.1	22.4	70.7	67.3

For the first time in 2014, farmers were asked questions about their nutrient management plans. They were used on 57% of farms with arable crops, or 77% on an area basis. For farms with grass the equivalent percentages were 29% and 32% respectively.

**Table E1.4 Soil testing percentage (%) of tillage and grass area, Great Britain 2014**

	<i>tillage area %</i>	<i>grass area %</i>
Standard P, K, Mg, pH	33.7	7.5
Nitrogen	13.0	3.1
pH (lime only)	14.1	3.6
Precision farming purposes	6.9	1.5

Standard P, K, Mg, pH was the most commonly used soil test in 2014, at 35% of the tillage area and 8% of the grass area. All types of soil tests were more prevalent on tillage than on grass.



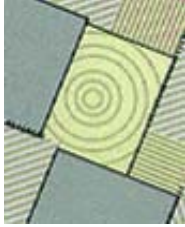
## APPENDIX 1 - SURVEY STATISTICS

### APP 1.1 SAMPLING VARIATION

**Table App 1.1 Standard errors of application rates for the major crops in 2014**

Great Britain	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	
	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	
winter wheat	2.3	2.5	1.2	1.3	1.6	1.4	2.0	2.0	5.9	1.6	1.8	1.9	1530
oilseed rape	2.3	2.4	0.7	1.8	2.0	2.7	2.3	2.3	1.9	2.2	2.2	2.6	541
winter barley	2.1	2.6	1.4	1.9	2.2	1.7	2.0	2.1	4.2	2.2	2.2	2.0	520
spring barley	1.8	2.4	1.7	1.3	1.7	1.2	1.6	1.9	2.1	1.3	1.7	1.9	747
maincrop potatoes	7.8	7.1	8.3	8.4	13.0	7.4	7.4	10.6	8.1	8.1	12.1	28.5	110
sugar beet	3.2	3.8	2.1	4.0	6.1	4.8	3.0	3.2	5.7	5.4	5.0	8.4	132
all tillage crops	1.9	2.3	1.1	0.9	1.2	1.0	1.8	1.9	2.0	1.1	1.6	1.6	4743
all grass	1.9	1.7	1.1	0.4	0.7	0.4	2.0	2.6	1.6	0.8	1.2	1.8	3491
England & Wales	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	
	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	
winter wheat	2.4	2.7	1.1	1.3	1.7	1.4	2.1	2.1	6.2	1.8	1.9	1.9	1419
oilseed rape	2.5	2.5	0.7	1.9	2.1	2.7	2.4	2.4	2.2	2.4	2.4	2.7	507
winter barley	2.3	2.8	1.4	2.0	2.3	1.7	2.1	2.3	4.8	2.5	2.4	1.9	461
spring barley	2.3	2.7	1.8	1.5	1.9	1.4	1.9	2.1	3.2	1.9	2.2	2.1	495
maincrop potatoes	8.1	7.6	8.8	9.0	13.8	8.0	7.8	10.9	8.6	8.8	13.0	30.8	101
sugar beet	3.2	3.8	2.1	4.0	6.1	4.8	3.0	3.2	5.7	5.4	5.0	8.4	132
all tillage crops	2.2	2.5	1.1	1.0	1.4	1.1	1.9	2.0	2.6	1.3	1.9	1.7	4137
all grass	2.1	2.0	1.1	0.5	0.7	0.4	2.4	2.9	2.0	1.0	1.5	2.1	2801
Scotland	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>total</i>	<i>strt</i>	<i>comp</i>	<i>total</i>	<i>total</i>	<i>total</i>	
	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	<i>N</i>	<i>N</i>	<i>N</i>	<i>P<sub>2</sub>O<sub>5</sub></i>	<i>K<sub>2</sub>O</i>	<i>SO<sub>3</sub></i>	
winter wheat	6.3	8.8	7.0	4.3	5.7	6.4	6.3	6.1	14.9	3.3	5.1	8.1	111
oilseed rape	6.7	6.6	4.0	5.8	7.4	10.7	6.7	6.6	4.4	3.6	5.1	8.4	34
winter barley	5.7	8.2	5.0	4.6	5.9	7.1	5.7	5.6	8.6	3.4	4.9	9.6	59
spring barley	3.0	3.8	3.1	2.0	2.7	2.3	2.7	3.6	2.8	1.7	2.4	4.1	252
all potatoes	21.4	15.5	19.9	22.2	34.4	16.3	18.6	36.9	18.6	21.2	28.4	23.8	12
all tillage crops	3.6	4.5	3.0	1.9	2.5	2.2	3.4	4.7	2.8	1.7	2.4	4.1	606
all grass	3.5	2.5	3.0	1.0	1.5	0.6	3.0	5.5	2.8	1.2	2.1	2.8	690

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 2014**

	2014	% total
Target sample	1500	100
2013 panellists agreeing to re-contact in 2014	1289	86
Achieved 'Main' sample from 2012 panel	955	64
Achieved additional 'Main' sample	173	12
Achieved '1 <sup>st</sup> reserve' sample	118	8
Achieved '2 <sup>nd</sup> reserve' sample	70	5
Achieved '3 <sup>rd</sup> reserve' sample	47	3
<b>Total achieved</b>	<b>1363</b>	<b>91</b>
Total number of refusals/non-contact	1272	
<b>Total number of farms approached</b>	<b>2635</b>	

**Table App 1.3 Response to main and reserve samples for 2010 - 2014**

<i>Net response rate</i>	2010	2011	2012	2013	2014
	%	%	%	%	%
Overall achieved rate	91	95	94	91	91
Achieved % of total contact attempts	48	59	53	51	52
Main sample	83	81	82	78	76
Reserve sample(s)	17	19	18	12	16
<i>Main reason for refusal</i>	2010	2011	2012	2013	2014
	%	%	%	%	%
Too busy	15	20	22	25	22
Not interested	10	13	13	16	17
Do not do surveys	3	4	4	5	5
Want payment	0	0	0	1	0
Too much paperwork	0	1	0	1	1
Non contact	55	40	41	32	41
Other <sup>a</sup>	16	22	20	20	13

<sup>a</sup> 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.

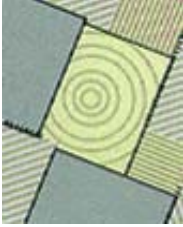


## APP 1.3 INFORMATION ON HOLDINGS BELOW 20 HECTARES

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 2013 was 197,849. Holdings below 20 hectares accounted for 4% of the total crop area and 10% of the total grass area; this was unchanged from the previous year. 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.

2013	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	6,115,721	89,783	241,393	39,600	4%	44%	108,066	197,849
of which crops	4,865,227	66,026	186,517	27,483	4%	42%	131,823	197,849
of which temporary grass < 5 years old	1,250,495	56,763	252,964	38,098	20%	67%	141,086	197,849
Total grass	6,403,458	161,848	612,412	87,122	10%	54%	36,001	197,849
grass < 5 years old	1,250,495	56,763	252,964	38,098	20%	67%	141,086	197,849
grass ≥ 5 years old	5,152,963	153,756	617,897	88,939	12%	58%	44,093	197,849

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.

	<b>County</b>	<b>BSFP REGION</b>	<b>GOR</b>
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 <sup>a</sup>
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 <sup>b</sup>	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 <sup>c</sup>	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]

<sup>a</sup> 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.

<sup>b</sup> 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.

<sup>c</sup> Not included in the British Survey of Fertiliser Practice.