THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2015

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The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods; and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

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

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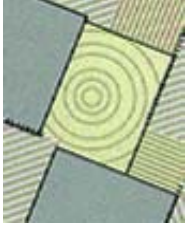


FOREWORD

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

The 2015 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 2015, 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 contribute to the meeting of 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.

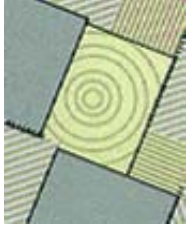
Contact information and feedback

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 2015.

April 2016



ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2015 British Survey of Fertiliser Practice.

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

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

Kate Benford[1]

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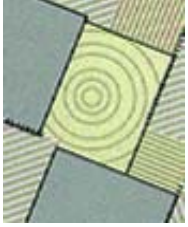

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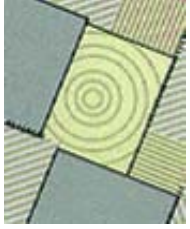

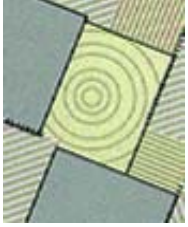

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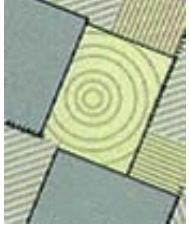
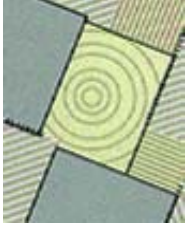
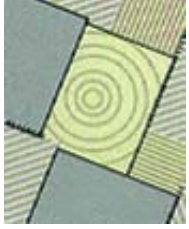






EXECUTIVE SUMMARY

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

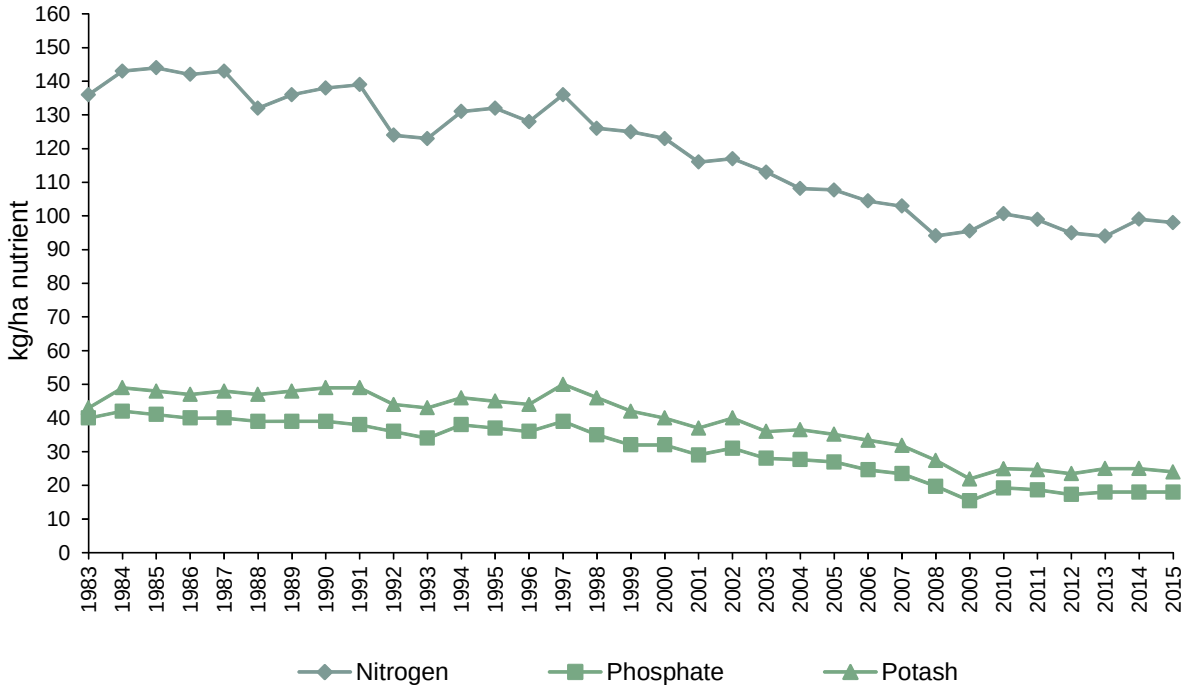
The main findings from the 2015 Survey on the use of the nutrients nitrogen, phosphorus, potassium and sulphur in Great Britain are summarised below (Table ES1).

Cropping patterns can influence fertiliser rates and dressing covers observed. In 2015 there was a 0.9% decrease in the total area of tillage crops planted, with the areas of winter wheat and winter oilseed rape both down on the previous year. Conversely, the area of legumes grown increased by just over 55%. 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 2015

	All Tillage	All Grass	All Crops and Grass
Total Nitrogen - N			
Overall application rate, 2015 (kg/ha)	146	56	98
Mean overall application rate, 2011-2015 (kg/ha)	144	57	97
Crop area receiving dressing, 2015 (%)	91	60	75
Average field rate, 2015 (kg/ha)	161	93	132
Total Phosphate - P_2O_5			
Overall application rate, 2015 (kg/ha)	29	9	18
Mean overall application rate, 2011-2015 (kg/ha)	29	9	18
Crop area receiving dressing, 2015 (%)	49	41	45
Average field rate, 2015 (kg/ha)	60	22	41
Total Potash - K_2O			
Overall application rate, 2015 (kg/ha)	38	12	24
Mean overall application rate, 2011-2015 (kg/ha)	39	13	24
Crop area receiving dressing, 2015 (%)	50	42	46
Average field rate, 2015 (kg/ha)	75	30	53
Total Sulphur - SO_3			
Overall application rate, 2015 (kg/ha)	31	3	16
Mean overall application rate, 2011-2015 (kg/ha)	29	3	14
Crop area receiving dressing, 2015 (%)	52	10	30
Average field rate, 2015 (kg/ha)	59	31	54

Figure ES1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2015

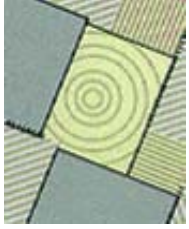


Nitrogen

- 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 1 kg/ha decrease in total nitrogen use on all crops and grassland in 2015 resulted from a 4 kg/ha decrease in the overall rate on grass, as the overall rate on tillage crops was unchanged at 146 kg/ha. The rate on tillage crops remains in the typical 145-150 kg/ha range which has been observed for the majority of the 30 years of the survey. 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. Whereas overall nitrogen rates on tillage have remained constant, since 2000 the overall applications made to grass have seen a significant decline. However this trend changed after 2009 and since then the overall nitrogen rate on grassland has remained relatively steady. The 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 wheat and winter barley increased 5 kg/ha and 3 kg/ha respectively. The overall nitrogen rate on spring barley decreased by 1 kg/ha to 105 kg/ha, with the 2013 rate being the highest recorded since 2002. Total nitrogen on oilseed rape and sugar beet increased by 2 kg/ha in 2015, to 193 and 98 kg/ha respectively.

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.
- 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 (33% cover) than on tillage crops (23% cover) and grazed grassland also receives manure as it is grazed.



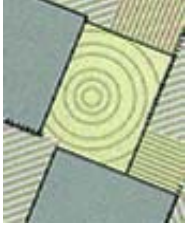
- Overall phosphate use on tillage crops declined gradually between 1984 and 1996. Thereafter the decline in rates became more marked until 2009, after which there was some recovery and relative stability, with an overall rate of 29 kg/ha in 2015. This is the third lowest rate since Great Britain records 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 between 1999 and 2009, but remained relatively stable since then, with a rate of 9 kg/ha in 2015.
- 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 2011 and 2015 overall potash application rates have been apparently stable 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 2015. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, tended to decline, although achieving some stability 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, and although there has been a slight reduction in dressing covers and overall rates since 2003 they are relatively stable again on tillage by 2015. However there was a significant reduction in dressing cover and overall rate of phosphate and potash on grassland between 2004 and 2011, although more recent data indicate a return to stability.

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 reduced significantly. Therefore there is a need for sulphur application to crops and grass; with crops such as oilseed rape being particularly sensitive to sulphur deficiency. Elemental sulphur can also be used as a soil acidifier for potatoes which can offer some protection against scab although sulphur as a nutrient is usually applied in the sulphate form.
- The Survey has collected detailed information on sulphur (SO_3) fertiliser use since 1993, when only 3-6% of the cereal crop areas and 8% of the oilseed rape area received a sulphur application. By 1997, these proportions had increased markedly to 13-14% for cereals and 30% for oilseed rape. Dressing covers for sulphur generally remained fairly static until 2002, and then increased steadily to 2007. Dressing covers reduced in 2008 and 2009 for all cereals except winter barley. In 2015 cereals sulphur dressing covers were in the 48%-62% range. The 73% dressing cover for winter oilseed rape was a 3% decrease from 2014.
- In 2015, 30% of all crops and grass received a dressing of sulphur, this figure was 52% for tillage crops. On tillage crops the overall application rate for sulphur was 31 kg/ha, unchanged from 2014. Applications on grass decreased in 2015 to 3 kg/ha, this low overall rate is caused by the low dressing cover, with only 10% of grass receiving a sulphur dressing.

Organic manures

- Historically, the Survey has focussed on the application of manufactured fertilisers although in recent years (since 2007) it has also collected information on the use 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 2015, around 65% 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. 34% of cattle manure and 65% of 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 mainly receive a manure dressing in August and September, prior to drilling, whereas spring sown and grass fields are predominantly dressed 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 soil testing. Datasets for key data series are available via the Defra website.

A1.1 HISTORY

The survey has been in existence, in various forms, since 1942 for England & Wales. It was extended to Scotland in 1983. Historical data from 1942 to 1997 have been summarised in several reviews spanning this period of time.[2, 3, 4, 5]

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

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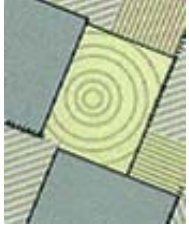
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

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

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

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



A2 SURVEY METHODOLOGY

A2.1 SAMPLE

This survey is based on a sample of holdings in order to reduce burdens and manage resources. The Survey sample is selected from the population of agricultural holdings compiled using the June Agricultural Survey (a sample survey conducted annually which records information on farm size, cropping, stocking and employment). In each year, two samples are extracted from the June Survey, one for England & Wales and one for Scotland. Holdings less than 20 hectares in size are excluded from the BSFP sample. These smaller farms account for a significant proportion of the number of holdings but a much smaller proportion of the area of crops and grass. At Great Britain level, holdings below this size account for 4% of the total crop area and 10% of the total grass area. Further information is provided in Appendix 1.3. Using this threshold reduces the number of farms which need to be sampled so reducing burdens and costs without significant adverse impact on the quality of the data. The data for the medium and large farms will be representative of the very small farms which are excluded, meaning that the overall figures are representative of all farms. Standard errors are reported in Appendix 1.1.

In England & Wales, farms are classified into one of three types, cropping, livestock and horticulture. Farms are then further classified into four size groups. In Scotland, a similar number of size groups are used but farms are classified into only two types, mainly cropping and mainly livestock.

These higher level farm types are based on groupings of the standard UK (and EU) farm classifications (called 'robust' types). Farms with a robust type of 'Other' (robust type 10) are not included in the sample. See A2.7 paragraph 9 for more details.

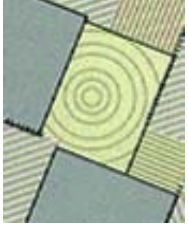
The target sample size is 1500 farms. This sample size has been designed in order to achieve a statistically representative sample at the national level. The farms are allocated to each of the combinations of farm type and size in proportion to the total area of crops and grass recorded in the June Survey (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 1,343 holdings in 2015, 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 2015, 69% of the sample had responded in the previous year. The profile of the panel in terms of farm size was 71% >200ha, 66% 100-200ha, 67% 50-100 ha and 69% >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 2015 survey, England & Wales

	farm holdings in population in 2014	total crops and grass in 2014 (column %)	notional sampling fraction[1] (%)	target sample size	achieved sample size	achieved sample fraction[2] (%)
England & Wales						
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	17,242	6.6	0.47	81	94	0.55
51-100 ha	15,546	12.8	1.01	157	152	0.98
101-200 ha	11,150	17.5	1.94	216	201	1.80
200+ ha	4,714	18.1	4.72	223	204	4.33
Total livestock & mixed	48,652	54.9	1.39	677	651	1.34
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	6,481	2.5	0.47	31	40	0.62
51-100 ha	6,081	5.0	1.02	62	47	0.77
101-200 ha	6,262	10.2	2.01	126	104	1.66
200+ ha	5,740	25.9	5.57	320	236	4.11
Total crops	24,564	43.6	2.19	538	427	1.74
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	669	0.2	0.88	6	7	1.05
51-100 ha	380	0.3	2.00	8	4	1.05
101-200 ha	216	0.3	3.83	8	9	4.17
200+ ha	101	0.5	13.10	13	10	9.90
Total horticulture	1,366	1.4	2.56	35	30	2.20
Total for England & Wales	74,582	100		1,250	1,108	1.49

[1] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2014*

[2] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2014*

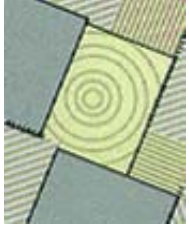


Table A2.2 Derivation of the stratified random sample for the 2015 survey, Scotland

	farm holdings in population in 2014	total crops and grass in 2014 (column %)	notional sampling fraction[1] (%)	target sample size	achieved sample size	achieved sample fraction[2] (%)
Scotland						
Cereal/general						
(Robust types: cereals, general cropping, horticulture)						
crops & grass area						
20-50 ha	750	1.4	0.48	4	4	0.53
51-100 ha	850	3.5	1.03	9	8	0.94
101-200 ha	826	6.6	2.01	17	16	1.94
200+ ha	454	8.6	4.73	21	16	3.52
Total cereal/general	2,880	20.2	1.75	50	44	1.53
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed, general cropping;forage)						
crops & grass area						
20-50 ha	4,729	8.8	0.46	22	24	0.51
51-100 ha	4,031	16.5	1.02	41	42	1.04
101-200 ha	3,231	25.5	1.97	64	60	1.86
200+ ha	1,565	29.1	4.65	73	65	4.15
Total livestock & mixed	13,556	79.8	1.47	200	191	1.41
Total for Scotland	16,436	100		250	235	1.43

A2.2 DATA COLLECTION

Data collection was undertaken between June and October 2015 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.

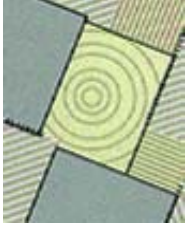
Official quantities of nitrogen, phosphate and potash fertiliser consumed annually in the UK since 1965 are shown in Table B2.6. These data are based on BSFP findings and confidential trade and sales data which are contributed by AIC industry members who represent approximately 90% of the market. They 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.

[1] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2014*

[2] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2014*



A2.4 ACCURACY AND RELIABILITY OF THE INFORMATION

The use of sampling in this survey means that there will be certain limitations associated with the data associated with this. The sampling methodology used is described more fully in Section A2.1 but essentially uses a random stratified sampling strategy approach, with an element of a core panel, to obtain a representative sample. A response rate of 53% was achieved in 2015, which was a 1% increase from 2014. 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.

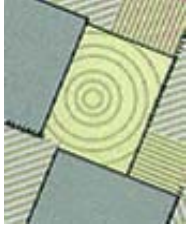
The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 9.2 million hectares in England and Wales and about 1.9 million hectares in Scotland. The estimates of the average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

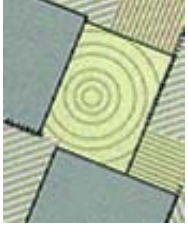
These AIC usage figures are compared to usage figures derived from BSFP and June crop area figures and the relationship between the ratios of N, P and K from both sets of data are checked and compared. Any inconsistencies or anomalies identified in the data are identified and followed up and any necessary 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. The dressing cover percentage of sulphur on grassland for 2014 (Table B1.11) has been corrected. We will provide information on any further revisions we make to the report or the datasets if any inaccuracies or errors occur.



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 2014 to autumn 2015, corresponding to the 2015 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 2014. For data collection and processing purposes, separate fields with identical cropping and fertiliser management on the same farm are blocked together as one 'field', to represent the total combined area of those fields. Areas within the same natural boundary receiving different treatments (crops on fertilisers) were recorded separately. Agricultural land which had been set-aside under the Single Payment Scheme was recorded, but was not included in analyses unless it was used to grow an industrial crop. Fallow land other than set-aside has always been collected by the survey, but is not included in the calculations of this report.

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

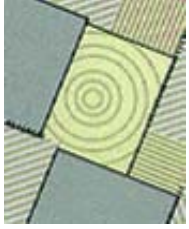
5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser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

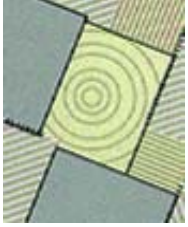
   https://www.gov.uk/structure-of-the-agricultural-industry-survey-notes-and-guidance

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

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

   These robust type groupings are also used in tables D2.3b, D3.2 and 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 2015. 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.

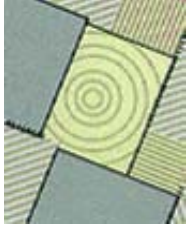
Nitrogen is important for building DNA and proteins in plants. It encourages growth of stems and leaves by promoting protein and chlorophyll. Provided there are adequate supplies of water and other nutrients, nitrogen usually has a large effect on crop growth, yield and quality. Whatever the source, 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 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 website of the Agriculture and Horticulture Development Board (AHDB)



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 2013/14 and 2014/15, 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 2015, 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 un-cropped. 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, 2014 – 2015

Crops	June 2014 '000s ha	June 2015 '000s ha	% change since 2014	% change since 2010	2015 crop areas as % of total tillage area
Wheat	1928	1825	-5.3	-5.3	39.5
Barley – winter	422	435	3.1	15.7	9.4
– spring	634	644	1.6	23.6	13.9
Total cereals[1]	*3144*	*3066*	*-2.5*	*3.1*	*66.4*
Oilseed rape – total	675	652	-3.4	1.6	14.2
Oilseed rape – winter	660	645	-2.3	2.5	14.0
Oilseed rape – spring	15	7	-53.3	-46.2	0.2
Sugar beet	116	90	-22.4	-23.7	1.9
Potatoes[2]	136	125	-8.1	-6.0	2.7
Linseed	15	15	0	-65.9	0.3
Peas/beans[3]	137	213	55.5	2.4	4.6
Maize/other fodder	255	259	1.6	16.1	5.6
Vegetables	146	157	7.5	30.8	3.4
Total tillage[4]	*4661*	*4618*	*-0.9*	*1.6*	*100.0*
Set-aside and bare fallow[5]	159	213	34.0	23.1	
Grassland					2015 grass areas as % of total grass area
Less than 5 years old	1249	1017	-18.6	-8.7	15.8
5 years and older	5182	5428	4.7	3.1	84.2
Total grass[6]	*6431*	*6444*	*0.2*	*1.0*	*100.0*
Total crops and grass[7]	*11092*	*11063*	*-0.26*	*1.3*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not bare fallow or set-aside.
[5] the obligatory set-aside rate for the 2014 and 2015 Single Payment Years was set at 0%.
[6] managed grassland, excluding rough grazing.
[7] total tillage + total grassland.

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

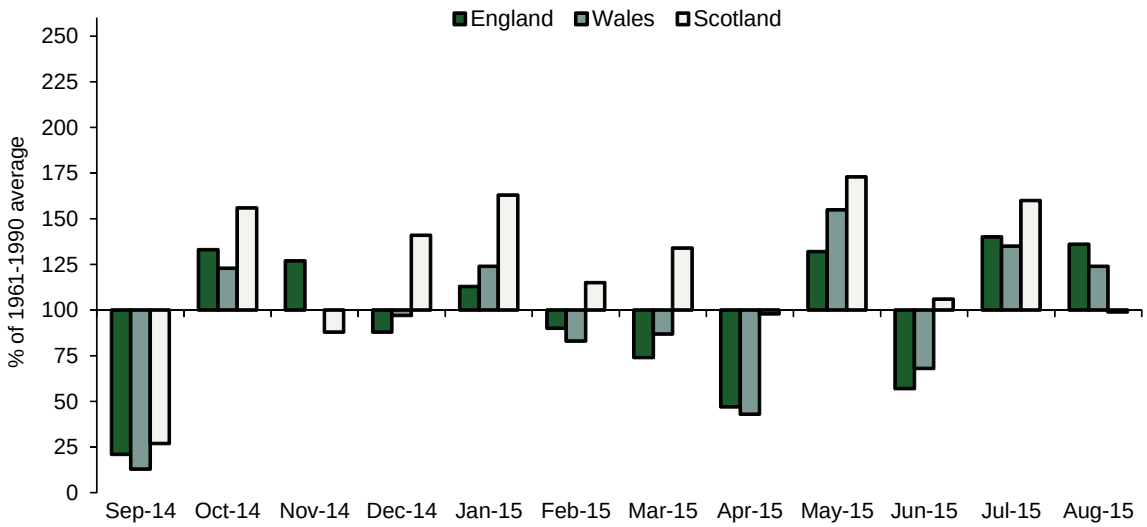
Comparing the 2014 and 2015 cropping years, the most marked changes were the increase in the area of peas and beans and the decrease in the area of sugar beet. The area of both winter and spring oilseed rape decreased. The area of wheat reduced by 5%, and the barley area increased by 4.7%. The total area under tillage crops decreased by 0.9% in 2015, whilst the total area of uncropped land (bare fallow and set-aside) increased by 34% in 2015. This was predominantly caused by an increase 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:

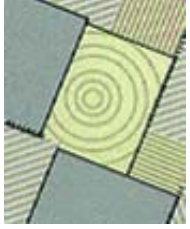
- A very wet (or very dry) autumn might delay the establishment of winter sown crops, or alter the ratio of winter to spring sown crops, with their different fertiliser requirements.
- Prolonged wet weather can increase leached losses of some nutrients, particularly nitrogen and sulphur. Weather conditions 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.

Rainfalls were below average in September with large parts of the country receiving less than 20% of the average (1961-1990). By contrast rainfall totals in October were mainly average or above as it was wet across Scotland, Cumbria and eastern England. November was very wet in south east England and eastern Scotland. The rainfall pattern for the three winter months was similar, with the wettest weather in western and northern Scotland and the eastern counties of England and Scotland being the driest. Spring 2015 was fairly unexceptional overall, with March bringing typical early spring weather. April had some notably dry and sunny days, whereas in May conditions were unsettled leading to cold conditions with above average rainfall. Spring rainfall totals across western Scotland were more than 130% of the average compared to less than 70% of the average across southern England. The summer was both cooler and wetter than the previous two summers. Rainfall totals were above average for most areas, but June was a dry month. Most of the country was wetter than average in July and August, with approaching double the normal rainfall for parts of Scotland and East Anglia in July. The timing of fertiliser applications was very similar to the pattern observed in the previous cropping year, with the peak months being March and April. (Table GB3.0).

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



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



SECTION B

COMMENTARY ON FERTILISER USE IN GREAT BRITAIN

This commentary refers to rates of application in mainland Britain of fertilisers containing nitrogen (N), phosphate (P_2O_5), potash (K_2O) and sulphur (SO_3) on tillage crops and grassland (excluding rough grazing). Section B1 of the report covers the five-year period 2011-15. 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 2014-15 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[7] and historic data for the key data series are also available on the Defra web site.

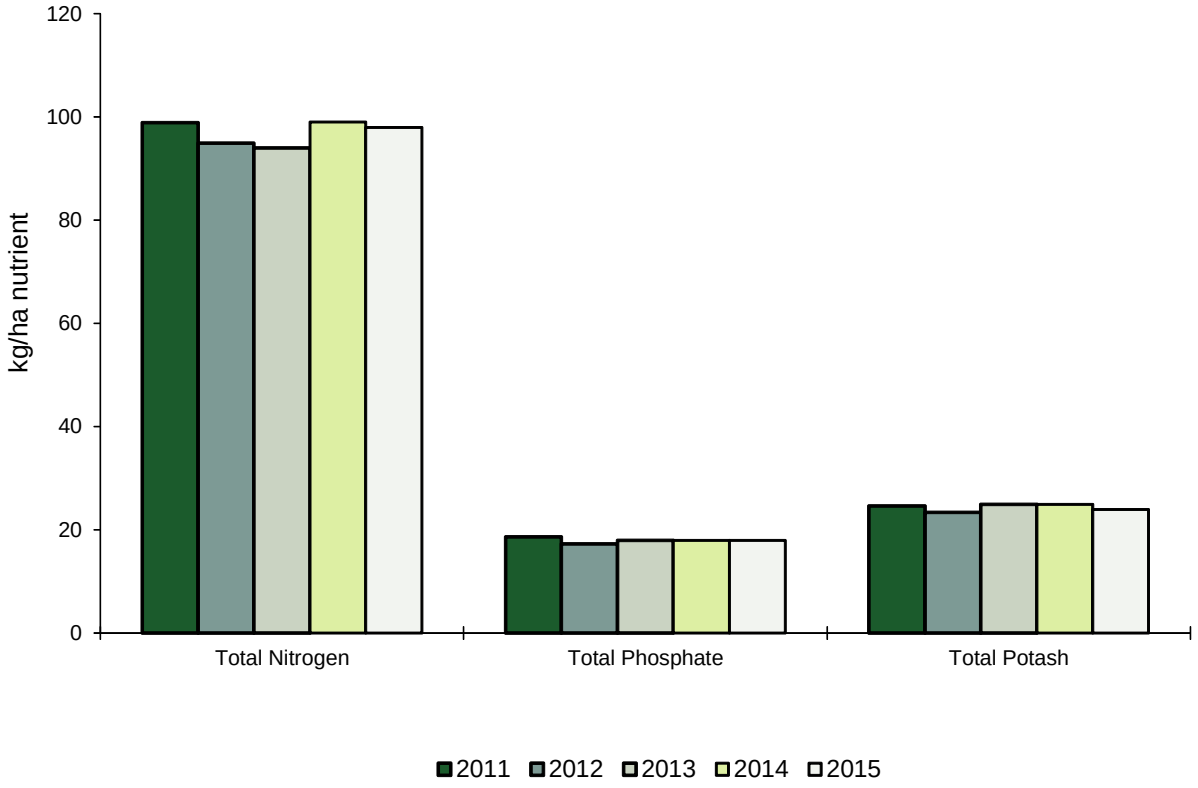
[7] Chalmers A. G. (2001) A Review of fertiliser, lime and organic manure use on farm crops in Great Britain from 1983 to 1997. *Soil Use and Management* **17**, 254-262.

B1 2015 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. The 2015 overall rate for all crops and grass is 98 kg/ha, a decrease of 1 kg/ha from 2014. Overall rates for phosphate and potash in 2015 were 18 kg/ha and 24 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 2011 - 2015

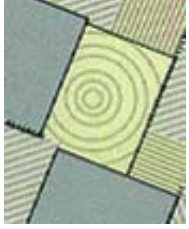


B1.1.1 Nitrogen

All crops and grassland

Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2011 – 2015
Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2011	146	57	99
2012	144	55	95
2013	136	59	94
2014	146	60	99
2015	146	56	98



Straight nitrogen

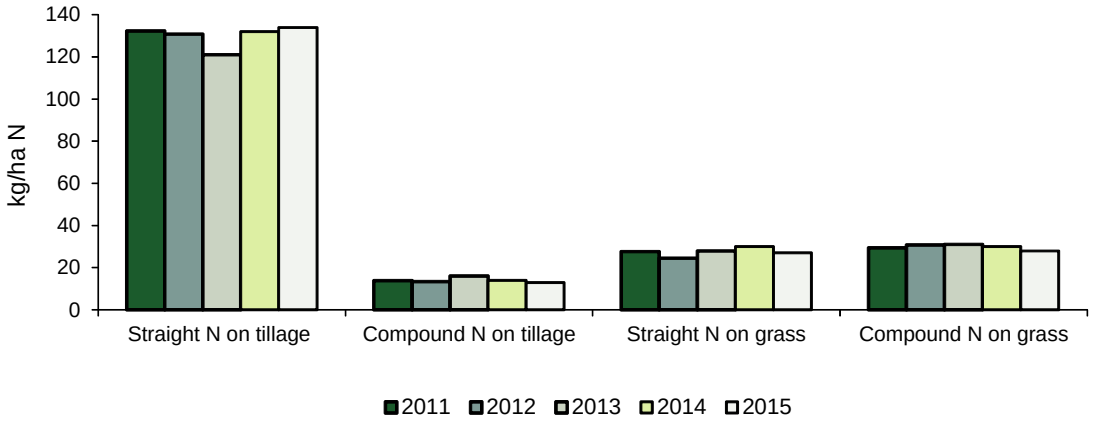
	tillage crops	*grass*	*all crops and grass*
2011	132	28	77
2012	131	25	72
2013	121	28	69
2014	132	30	76
2015	134	27	77

Compound nitrogen

	tillage crops	*grass*	*all crops and grass*
2011	14	29	22
2012	13	31	23
2013	16	31	24
2014	14	30	23
2015	13	28	21

The 1 kg/ha decrease in total nitrogen use on all crops and grassland (Figure B1.1) was caused by a decrease in the overall rates on grass. The overall nitrogen rate on tillage crops was unchanged from 2014. On grass the overall application rates decreased for straight N by 3 kg/ha, whilst compound N reduced by 2 kg/ha to 28 kg/ha. On tillage crops the rate of straight N increased to 134 kg/ha whilst the rate of compound N reduced by 1 kg/ha. The overall rate of compound N on all crops and grass is stable at 21-24 kg/ha over the five year period 2011-15.

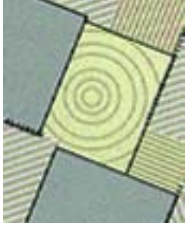
Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2011 – 2015



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 2015, unchanged from 2014. The increase in the overall application rate was therefore caused by the 2 kg/ha increase to the average field rate, which was 159 kg/ha in 2015.

There are a number of reasons for the dominance of straight nitrogen over the use of nitrogen in compound fertilisers, with the principal one being the large area of winter-sown crops. As is shown in Table A3.1, about 63% 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

The 4 kg/ha decrease to the overall N application rate in 2015 was mainly 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 decreased by 4 kg/ha to 100 kg/ha, whilst the compound N average field rate decreased by 2 kg/ha to 70 kg/ha.

B1.1.2 Phosphate, Potash and Sulphur

Phosphate

Table B1.2a shows overall phosphate applications for the past five years. The 2015 phosphate rate on tillage was unchanged in 2015 at 29 kg/ha, with the same proportion receiving a dressing (49%) and a slightly increased average field rate (60 kg/ha). For grassland the overall rate has been more stable, and 2015 saw an unchanged dressing cover and a decrease in the average field rate to 22 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 2011 – 2015

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2011	29	9	19
2012	28	9	17
2013	28	9	18
2014	29	10	18
2015	29	9	18

Total potash

	tillage crops	*grass*	*all crops and grass*
2011	39	12	25
2012	37	12	23
2013	40	13	25
2014	39	14	25
2015	38	12	24

Potash

In line with the recent average, in 2015 the overall potash rate was 38 kg/ha on tillage crops, and on grassland the overall rate decreased by 2 kg/ha to 12 kg/ha. On tillage crops the proportion of the area receiving a dressing of potash was unchanged at 50%, whilst the average field rate decreased by 3 kg/ha to 75 kg/ha. On grass dressing cover decreased slightly to 42% and the average field rate decreased to 30 kg/ha.

Sulphur

Table B1.2b shows overall sulphur applications for the past five years. The overall rate on tillage crops has varied between 26 and 31 kg/ha over the period, with the highest rates recorded in the last two years. The proportion of the tillage area receiving a sulphur dressing was also at its highest over the five year period at 52% in 2015. The average field rate on tillage crops decreased by 1 kg/ha in 2015 to 59 kg/ha. The overall rate of sulphur on grass has been more stable; albeit with a 1 kg/ha decrease between 2014 and 2015. 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.

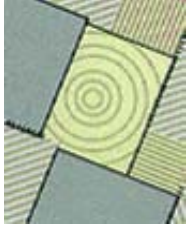


Table B1.2b Overall sulphur use (kg/ha), Great Britain 2011 – 2015
Total sulphur

	tillage crops	*grass*	*all crops and grass*
2011	26	2	13
2012	29	2	14
2013	27	2	13
2014	31	4	16
2015	31	3	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 2015 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.

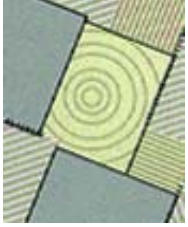


Table B1.3a Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2011 – 2015

Total nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [8]	oilseed rape [9]	sugar beet
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
2015	190	105	147	157	193	98

Straight nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	184	72	139	56	185	88

Compound nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	6	33	8	102	8	10

Total phosphate	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	28	32	30	111	30	23

Total potash	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	34	44	41	186	31	64

Total sulphur	winter wheat	spring barley	winter barley	maincrop potatoes [1,10]	oilseed rape [2]	sugar beet
2011	25	16	21		61	13
2012	28	17	25		63	12
2013	29	19	27		59	27
2014	32	21	28		63	26
2015	34	21	29		60	26

[8] Figures for maincrop potatoes include second second earlies.
[9] Single crop grouping for the combined winter and spring oilseed rape areas.
[10] 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.

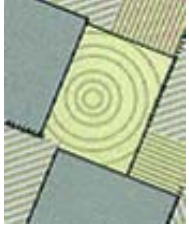


Table B1.3b Average field rates (kg/ha) on major tillage crops, Great Britain 2011 – 2015

Total nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [11]	oilseed rape [12]	sugar beet
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
2015	193	107	149	166	193	100

Straight nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	189	95	144	118	186	96

Compound nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	58	65	58	144	35	47

Total phosphate	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	64	48	55	145	63	59

Total potash	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	73	62	68	230	70	98

Total sulphur	winter wheat	spring barley	winter barley	maincrop potatoes [1,13]	oilseed rape [2]	sugar beet
2011	55	39	45		86	56
2012	54	39	50		86	59
2013	55	43	54		82	65
2014	57	45	50		82	57
2015	55	44	56		83	62

[11] Figures for maincrop potatoes include second second earlies.
[12] Single crop grouping for the combined winter and spring oilseed rape areas.
[13] 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.

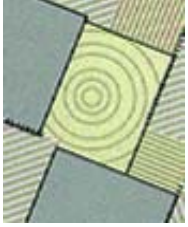


Table B1.4 Dressing cover (% area) on major tillage crops, Great Britain 2011 – 2015

Total nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [14]	oilseed rape [15]	sugar beet
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
2015	99	98	99	95	100	98

Straight nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	98	75	97	47	99	92

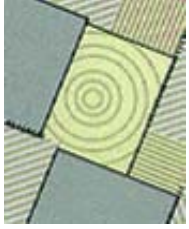
Compound nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2011	10	55	19	85	20	11
2012	10	60	16	72	17	13
2013	11	48	18	78	21	16
2014	10	54	18	66	16	21
2015	10	51	13	70	23	21

Total phosphate	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	44	67	54	76	47	40

Total potash	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	46	70	60	81	44	65

Total sulphur	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
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
2015	62	48	52	23	73	42

[14] Figures for maincrop potatoes include second second earlies.
[15] 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 2014 and 2015 for all the major tillage crops except spring barley. The overall rate of total nitrogen on winter wheat increased by 5 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 decreased to 107 kg/ha. Rates for potatoes are more variable; the standard error for total nitrogen for the average field rate was 8.8 (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 2011 – 2015

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
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
2015	213	184	112	101	136	153

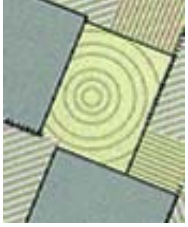
Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice Milling varieties are often grown as a second wheat and often receive extra nitrogen, 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 2015 was 213 kg/ha an increase of 5 kg/ha over 2014. The non-milling crop continues to dominate the wheat crop area (Table B1.6) with only 30% of the crop area in 2015 being grown as milling wheat (5 year mean: 29%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2011 – 2015, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
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
2015	30	70	55	45	23	77

Spring barley

Overall use of total nitrogen on spring barley decreased by 1 kg/ha in 2015 to 105 kg/ha. The 2013 rate was the highest reported rate since 2002, and including the 2015 rate increased the 5 year mean to 103 kg/ha. The overall application rate of straight nitrogen increased to 72 kg/ha, whilst the overall application rate for



compound N decreased to 33 kg/ha. The overall decrease was caused by a decreased percentage of the spring barley area receiving a dressing of compound N (51% in 2015 compared to 54% in 2014, shown in table B1.4). The average field rate for total nitrogen was 107 kg/ha in 2015, in line with the five year average.

Further analysis of the data by crop type (Table B1.5) shows the average rate applied to the spring malting crop was unchanged in 2015 at 112 kg/ha. For non-malting crops the nitrogen application rate decreased to 101 kg/ha, with a five year mean of 101 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)[16]. 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 2015 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 2011-15 is 58%, but increased from the low proportion in 2013 to 55% in 2015.

Winter barley

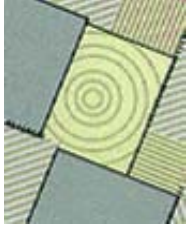
In the period 2002-08 overall total nitrogen use on winter barley decreased from year to year, down to 132 kg/ha in 2008. This rate has increased albeit with some fluctuations to 147 kg/ha in 2015. The straight nitrogen rate increased by 5 kg/ha whereas the compound nitrogen rate decreased by 2 kg/ha in 2015.

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 decreased by 4 kg/ha to 136 kg/ha in 2015 giving a five year mean of 133 kg/ha. For non malting crops the average field rate increased by 6 kg/ha to 153 kg/ha in 2015 (Table B1.5), with the 5 year average being 149 kg/ha.

The higher application rates of nitrogen (five-year mean of +16 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 23% in 2015, which was less than in the recent past, with the five year mean calculated as 31%. (Table B1.6).

[8] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the AHDB 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 the farm being surveyed are not captured in the Survey.

In 2015 the overall rate was 157 kg/ha, above the five year mean of 153 kg/ha. (Table B1.3a). The increase in 2015 is due to increases in the dressing cover percentage and average field rate of compound nitrogen (Table B1.3b, B1.4), compared to the previous year (70% and 66%) and (144 kg/ha and 119 kg/ha in 2014).

Oilseed rape

In 2015, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, increased by 2 kg/ha to 193 kg/ha (five year mean 188 kg/ha). This slight increase is a continued 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 1 kg/ha between 2014 and 2015 to 193 kg/ha. The rate for the spring crop decreased by 39 kg/ha to 115 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 2011 – 2015

Total nitrogen (kg/ha)

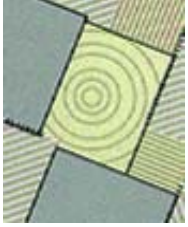
	winter oilseed rape	*spring oilseed rape**
2011	193	142
2012	187	119
2013	188	121
2014	192	154
2015	193	115

* 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 2015 to 98 kg/ha, slightly over the five year mean (94 kg/ha). The proportion of crop area receiving a nitrogen dressing was 98%, which is consistent with recent years. The average field rate of compound nitrogen was slightly lower than in 2014, although dressing cover with compound nitrogen is low at 21% of the sugar beet area in comparison to 92% dressing cover with straight N. The average field rate of straight nitrogen increased by 6 kg/ha to 96 kg/ha in 2015.



B1.2.2 Phosphate and Potash

Phosphate

In 2015 the overall phosphate rate increased on winter wheat, oilseed rape and sugar beet, with decreases observed for both winter and spring barley. Higher overall rates were caused by increases to average field rates and increased dressing covers on oilseed rape and sugar beet (Table B1.3b and B1.4). Lower overall rates were also caused by reduced average field rates on winter and spring barley. The overall phosphate rate of 29 kg/ha for tillage crops is in line with the 2011-15 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 2015 by 1 kg/ha, to 38 kg/ha. This is in line with the 2011-15 five year average (Table B1.2a). The decrease in overall potash rate on tillage crops in 2015 was caused by a decrease in the average field rate as the proportion of the crop area receiving a dressing was unchanged at 50%. The average field rates for potash decreased on all the major tillage crops except potatoes and sugar beet. As noted for nitrogen, part of the reason for recent apparent fluctuations in values for 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 2015 for spring barley, potatoes and oilseed rape, 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 2015 cereals dressing covers with sulphur were in the 48-62% range. In oilseed rape the 3% decrease in dressing cover makes it in line with the five year average, 73% (Table B1.8). In 2015 average field rates increased in winter barley and oilseed rape, but decreased on winter wheat and spring barley.

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2011 – 2015

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*	*all tillage*
2011	46	46	40	70	42
2012	52	51	45	73	47
2013	53	50	43	72	47
2014	57	57	47	76	51
2015	62	52	48	73	52

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*	*all tillage*
2011	55	45	39	86	60
2012	54	50	39	86	61
2013	55	54	43	82	58
2014	57	50	45	82	60
2015	55	56	44	83	59

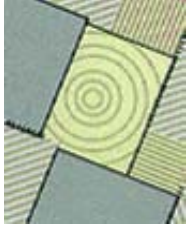


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of 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 2015 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, 2011 – 2015

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2011*	45	45	40	70
	2012	52	50	45	74
	2013	53	50	46	73
	2014	56	58	50	77
	2015	61	51	53	82
Scotland*	*2011*	58	50	39	68
	2012	61	54	44	49
	2013	45	45	39	53
	2014	61	46	43	69
	2015	65	58	41	72

* Greater variability in the Scottish data may be 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 2011 – 2015

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
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
2015	27	28	56	9	12	3

Dressing cover for total nitrogen on grass decreased in 2015 to 60% (Table B1.11). The long term trend has been for declining dressing cover for total nitrogen and the proportion receiving a dressing remains just 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 100 kg/ha.

Overall application rates for phosphate and potash on grass were 9 and 12 kg/ha respectively, a slight decrease from 2014.

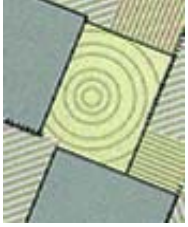


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2011 – 2015

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
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	11
2015	27	41	60	41	42	10

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
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
2015	100	70	93	22	30	31

The proportion of the grass area receiving a straight nitrogen dressing decreased by 2%, to 27% and the compound N dressing cover was unchanged at 41% in 2015. The dressing cover percentage of phosphate on grass was the same as in 2014 at 41%, with the potash decreasing by 1%. The five year means are 41% and 42% respectively.

Average field rates for in 2015 decreased to 22 kg/ha for phosphate and 30 kg/ha for potash, up from the historic low rates reported between 2011 and 2013.

B1.3.1 Nitrogen

Cutting and grazing management

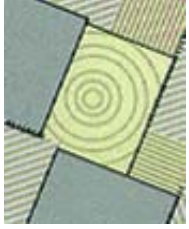
Fertiliser requirements for grassland vary according to the type of livestock enterprise, intensity of production and the associated cutting and grazing regimes used for sward management. Fertiliser use on dairy, other livestock and mixed farms in Great Britain in 2015 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2011 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 2011 – 2015

	grazed [1]	*silage* [2]	*hay* [2]
2011	90	29	11
2012	90	28	10
2013	90	28	12
2014	88	29	11
2015	90	29	11

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2015 is the same as the five year mean of 90%.

[1] May also be cut
[2] 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 2011 – 2015

Total nitrogen

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
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
2015	51	100	37	*2015*	87	121	75

Straight nitrogen

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
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
2015	24	49	17	*2015*	95	114	76

Compound nitrogen

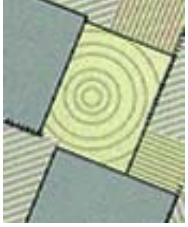
	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2011	26	53	18	*2011*	68	94	55
2012	28	56	22	*2012*	71	97	64
2013	29	57	23	*2013*	71	96	64
2014	28	52	22	*2014*	70	94	64
2015	26	51	21	*2015*	67	91	64

In 2015 the overall total nitrogen rate for the grazed category decreased by 3 kg/ha to 51 kg/ha, with the rate on the silage category decreasing by 4 kg/ha to 100 kg/ha.

The average field rates of straight nitrogen decreased on all categories of grass in 2015. Compound nitrogen rates also decreased except on grass fields cut for hay. The five year means for the overall compound nitrogen rate are 27, 54 and 21 kg/ha for grazed grass, silage and hay respectively, a slight decrease on last year's five year means.

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

[1] May also be cut
[2] 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 2011 – 2015

Total phosphate

	overall application rate			*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]	*grazed* [1]	*silage* [2]	*hay* [2]
2011	8	15	7	21	27	21
2012	8	15	8	20	27	21
2013	9	16	8	21	28	22
2014	9	15	9	23	28	27
2015	8	15	8	21	27	23

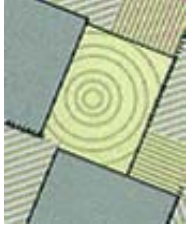
Total potash

	overall application rate			*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]	*grazed* [1]	*silage* [2]	*hay* [2]
2011	11	24	10	27	41	27
2012	11	25	9	27	41	26
2013	11	27	11	27	44	29
2014	12	26	14	29	44	36
2015	11	25	11	27	42	33

The overall phosphate rate was unchanged on silage grass in 2015, and reduced by 1 kg/ha on grazed grass and that cut for hay. The decrease 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 8, 15 and 8 kg/ha, respectively. While average field rates decreased on all categories of grass recent data suggest that the long term decline in application rates may be coming to an end.

Overall potash rates in 2015 decreased by 1 kg/ha on grazed and silage grass and decreased by 3 kg/ha on grass cut for hay. The average field rate on grazed and silage grass decreased by 2 kg/ha, with the rate on the cut for hay category decreasing to 33 kg/ha.

[1] May also be cut
[2] May also be grazed



B1.3.3 Sulphur

In 2015, 10% of the total grassland area received a sulphur dressing (mean 8% for 2011-15 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 decreasing by 1 or 5% in 2015.

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 2011 – 2015

Dressing cover (%)

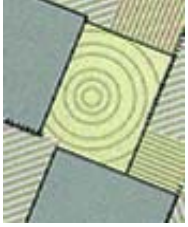
	grazed [1]	*silage* [2]	*hay* [2]	*all grass*
2011	6	11	3	6
2012	6	14	7	7
2013	7	16	8	8
2014	10	18	11	11
2015	9	17	6	10

Average application rate per year (kg/ha SO_3)

	grazed [1]	*silage* [2]	*hay* [2]	*all grass*
2011	36	39	39	36
2012	31	34	23	32
2013	31	37	32	33
2014	32	34	28	33
2015	30	34	37	31

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 2015 average field rates decreased on grazed grass, were unchanged on that cut for silage and increased on hay fields. The five year means are 32, 36 and 32 kg/ha SO_3 for grazed, silage and hay grassland, respectively (Table B1.15). Note that the average application rates in Table B1.15 are annual totals, not rates per cut.

[1] May also be cut
[2] May also be grazed



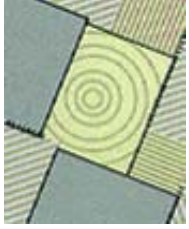
B2 LONGER TERM TRENDS FOR GREAT BRITAIN

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 - 2015 and Scotland and Great Britain 1983 – 2015

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2015	149	130	146	53	67	56	100	89	98



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 are 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 mix and area or changes in nitrogen applications to specific crops (see Figure B2.3). The rate for 2015 is in 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 fell consistently relative to those made to tillage crops, but during the last five years the average difference in overall nitrogen rate has remained relatively constant at 86 kg/ha. The recent decline in cattle numbers is thought to have contributed to this reduction in the nitrogen rate on grassland, possibly in conjunction with some improvement in manure use efficiency, encouraged by a higher nitrogen fertiliser price.

Data on straight and compound nitrogen for Great Britain are not available for the period 1983-91 when the survey in Scotland was separate from the one in England & Wales. Figure B2.2 shows the overall rates of straight and compound nitrogen on tillage crops and grassland. Most of the total nitrogen fertiliser used on tillage crops each year has been applied in straight form. 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 – 2015

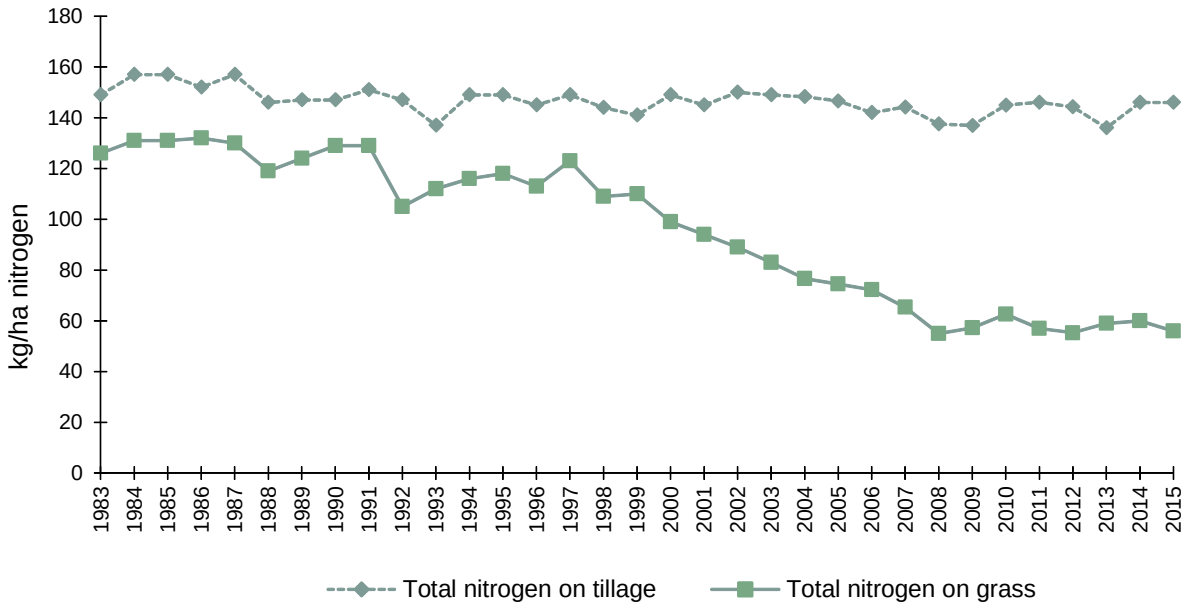
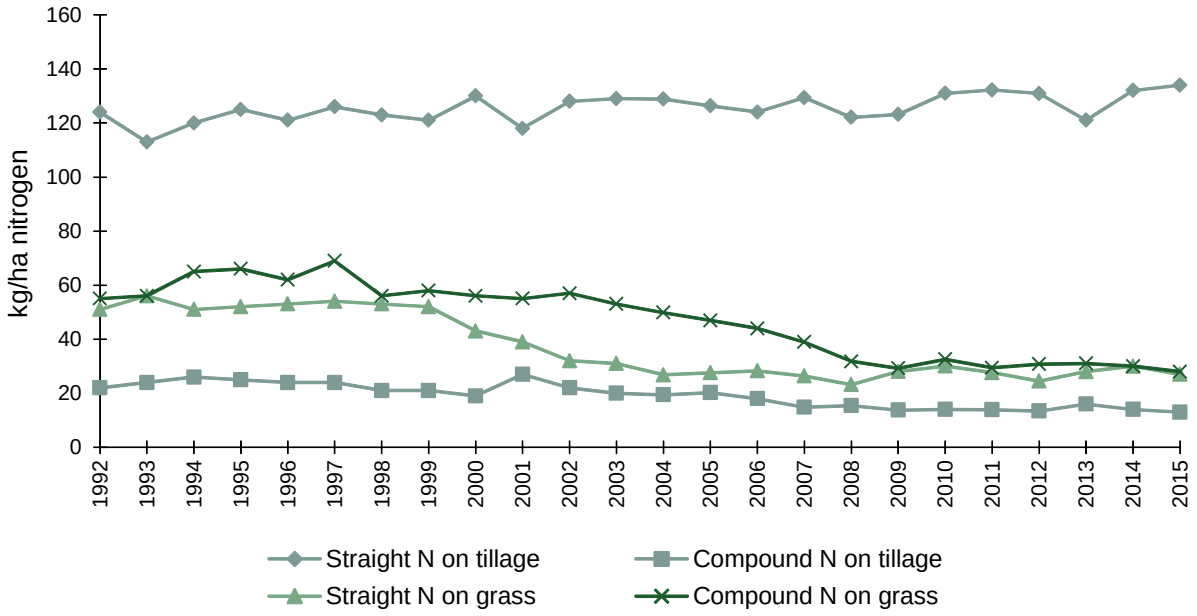


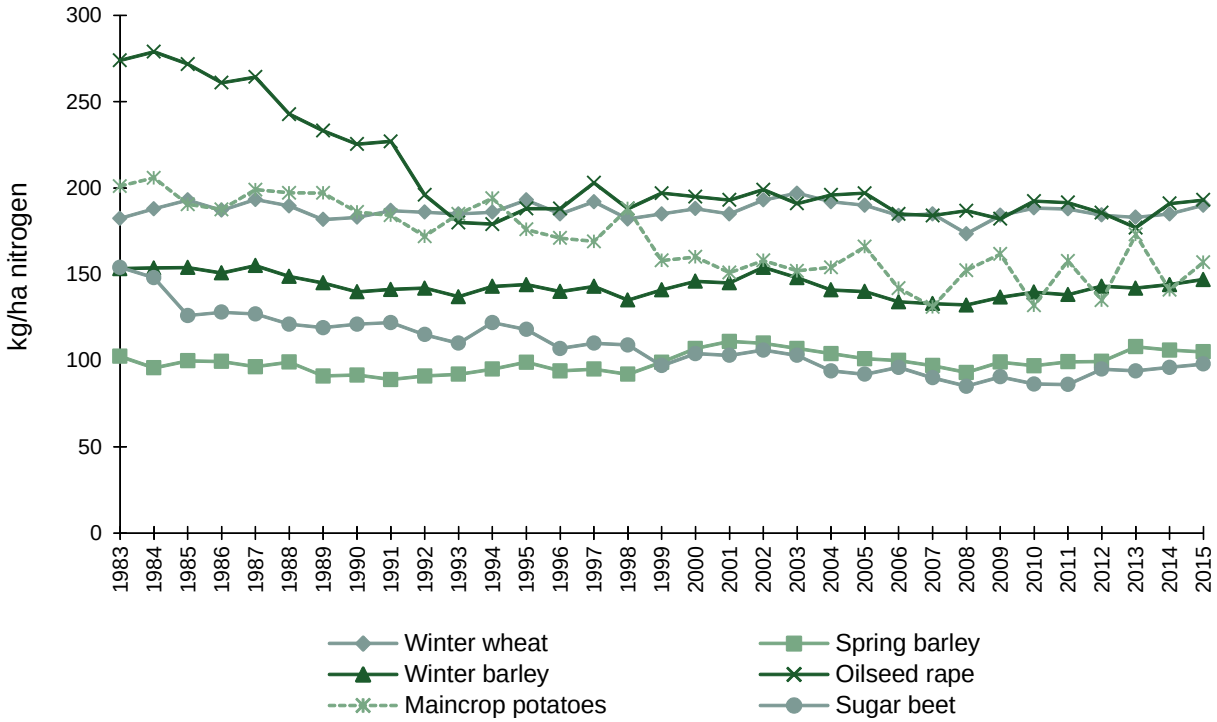
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2015

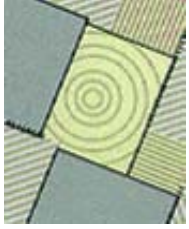


B2.1.1 Nitrogen use on major tillage crops

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 – 2015





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 timing of fertiliser applications it is possible to assess the extent to which autumn and winter nitrogen is applied. The standard advice is that autumn nitrogen is not required for winter cereals, as economic yield benefits are rare and such applications are 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 the trend continues to be reduced dressing cover of autumn applied nitrogen on winter cereals. The area receiving autumn nitrogen is too low for data relating to average field application to be used. Autumn nitrogen at 30 kg/ha is recommended for winter oilseed rape, unless the soil has a high nitrogen fertility, as the crop normally requires more nitrogen than winter cereals during the autumn growth period.

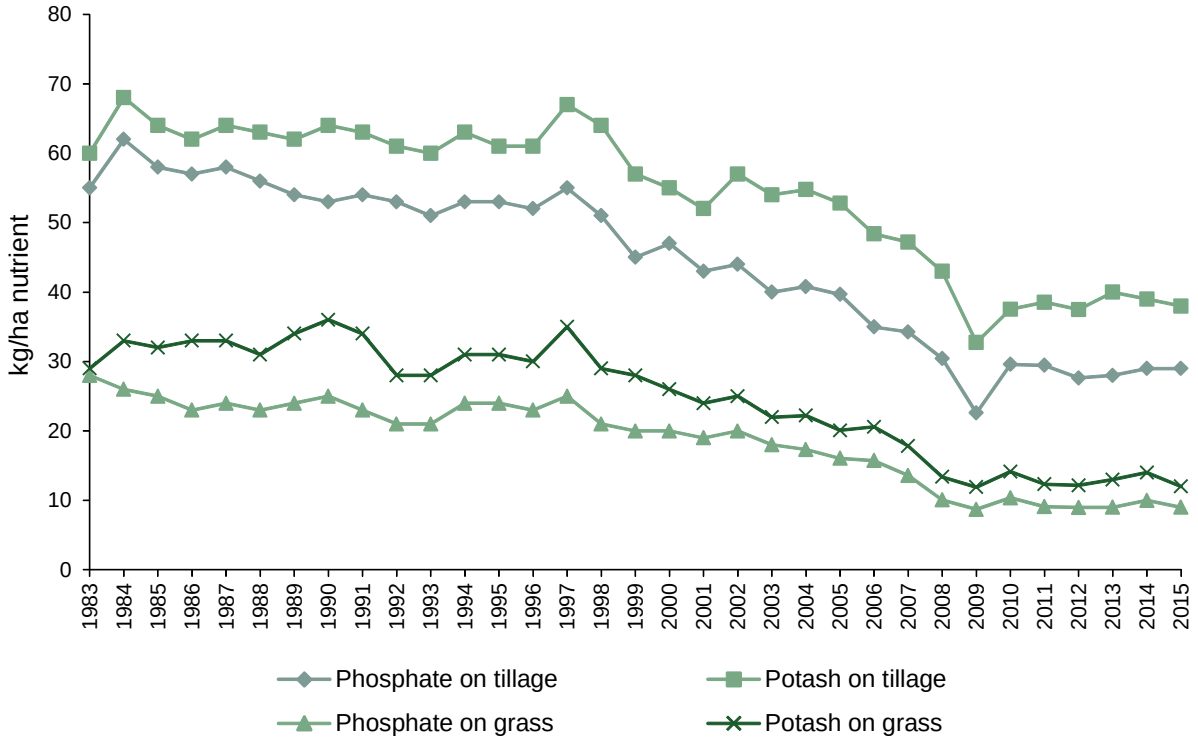
Table B2.2 Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape and average application rate (kg/ha) for winter oilseed rape, England & Wales 1985 – 1998 and Great Britain 1999 – 2015

	winter wheat	*winter barley*	*winter oilseed rape*	
	dressing cover	*dressing cover*	*dressing cover*	*application rate*
England & Wales				
1985	56	64	88	52
1986	44	50	81	52
1987	36	43	74	53
1988	28	31	64	45
1989	18	25	52	45
1990	10	16	45	42
1991	11	12	49	46
1992	8	10	50	44
1993	8	8	41	42
1994	12	16	44	39
1995	11	13	48	38
1996	11	12	51	37
1997	12	11	44	36
1998	7	12	34	38
Great Britain				
1999	6	10	35	43
2000	7	11	33	42
2001	7	14	43	43
2002	8	16	41	47
2003	5	9	42	39
2004	6	9	35	40
2005	4	9	42	40
2006	5	7	28	34
2007	3	5	27	41
2008	3	6	31	33
2009	2	3	26	31
2010	2	7	29	33
2011	2	3	35	29
2012	2	5	31	27
2013	2	4	32	28
2014	2	5	32	29
2015	2	3	38	32

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 – 2015



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. 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.

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 2015. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s and in the last five years have been in the 12-14 kg/ha range.

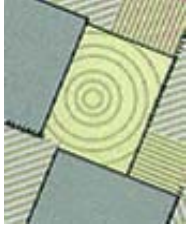


Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1969 - 2015 and Scotland and Great Britain 1983 – 2015

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1969	53	-	-	34	-	-	-	-	-
1970	56	-	-	32	-	-	-	-	-
1971	54	-	-	34	-	-	-	-	-
1972	56	-	-	34	-	-	-	-	-
1973	54	-	-	34	-	-	-	-	-
1974	51	-	-	27	-	-	39	-	-
1975	46	-	-	27	-	-	34	-	-
1976	50	-	-	29	-	-	38	-	-
1977	51	-	-	26	-	-	37	-	-
1978	49	-	-	28	-	-	39	-	-
1979	49	-	-	27	-	-	38	-	-
1980	49	-	-	27	-	-	37	-	-
1981	51	-	-	25	-	-	38	-	-
1982	55	-	-	24	-	-	39	-	-
1983	54	63	55	26	36	28	39	47	40
1984	61	68	62	25	33	26	42	48	42
1985	56	70	58	24	30	25	40	46	41
1986	56	63	57	22	27	23	40	42	40
1987	56	71	58	23	28	24	39	45	40
1988	54	65	56	21	31	23	38	45	39
1989	52	67	54	23	31	24	38	45	39
1990	51	68	53	24	28	25	38	43	39
1991	53	65	54	23	24	23	38	40	38
1992	51	67	54	19	30	22	35	43	38
1993	49	65	52	19	28	21	33	41	35
1994	51	69	53	23	28	24	37	43	38
1995	50	68	53	22	31	24	36	45	37
1996	51	65	52	22	26	23	36	40	36
1997	53	69	55	24	32	25	38	46	39
1998	49	66	51	20	27	21	34	43	35
1999	43	64	45	19	27	20	31	42	32
2000	44	60	47	18	30	20	31	42	32
2001	40	60	43	16	29	19	27	41	29
2002	41	62	44	18	26	20	29	39	31
2003	37	61	40	16	26	18	26	39	28
2004	38	63	41	15	27	17	25	40	28
2005	37	56	40	15	22	16	25	35	27
2006	32	53	35	14	22	16	23	33	25
2007	32	53	34	12	19	14	22	32	23
2008	28	50	30	9	16	10	18	28	20
2009	19	49	23	7	15	9	13	27	15
2010	27	50	30	9	16	10	18	27	19
2011	27	50	29	8	14	9	17	25	19
2012	25	50	28	8	14	9	16	25	17
2013	25	51	28	8	14	9	16	27	18
2014	26	50	29	8	15	10	17	26	18
2015	26	51	29	8	13	9	17	27	18

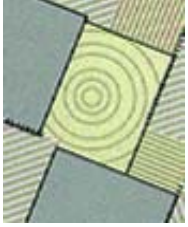
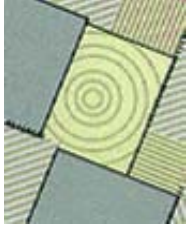


Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2015 and Scotland and Great Britain 1983 – 2015

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1969	61	-	-	23	-	-	-	-	-
1970	61	-	-	26	-	-	-	-	-
1971	59	-	-	21	-	-	-	-	-
1972	63	-	-	20	-	-	-	-	-
1973	60	-	-	22	-	-	-	-	-
1974	56	-	-	20	-	-	36	-	-
1975	51	-	-	21	-	-	34	-	-
1976	56	-	-	23	-	-	37	-	-
1977	56	-	-	23	-	-	39	-	-
1978	56	-	-	25	-	-	41	-	-
1979	53	-	-	27	-	-	40	-	-
1980	54	-	-	26	-	-	40	-	-
1981	56	-	-	26	-	-	41	-	-
1982	61	-	-	28	-	-	44	-	-
1983	60	62	60	28	36	29	44	46	43
1984	68	67	68	33	35	33	50	49	49
1985	63	67	64	32	34	32	48	47	48
1986	62	61	62	33	30	33	48	43	47
1987	63	70	64	33	31	33	48	47	48
1988	63	66	63	30	34	31	47	47	47
1989	60	73	62	34	36	34	48	51	48
1990	62	74	64	36	35	36	49	50	49
1991	62	72	63	35	31	34	49	47	49
1992	59	72	63	26	34	28	43	48	45
1993	58	72	60	27	34	29	42	47	43
1994	62	74	63	31	31	31	46	46	46
1995	59	72	61	30	34	31	44	48	45
1996	59	73	61	31	28	30	45	44	44
1997	66	74	67	35	36	35	50	50	50
1998	63	73	64	28	36	29	45	51	46
1999	55	71	57	27	32	28	41	48	42
2000	54	67	55	24	33	26	39	47	40
2001	48	72	52	23	33	24	34	49	37
2002	55	72	57	24	30	25	38	46	40
2003	51	73	54	20	31	22	34	46	36
2004	52	72	55	21	30	22	35	46	37
2005	51	65	53	19	26	20	34	40	35
2006	46	68	48	19	28	21	32	42	33
2007	44	69	47	17	23	18	30	40	32
2008	40	67	43	12	20	13	26	37	27
2009	29	64	33	10	20	12	19	35	22
2010	33	67	38	13	19	14	23	35	25
2011	35	65	39	11	16	12	23	32	25
2012	34	68	37	11	17	12	22	33	23
2013	36	68	40	11	19	13	22	36	25
2014	35	67	39	12	20	14	23	35	25
2015	33	65	38	11	17	12	22	34	24



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 (33% cover) than on tillage crops (23% cover) and grazed grassland also receives manure as it is grazed.

Dressing covers of phosphate and potash on tillage and grass for the period 2004-15 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 (30% reduction) in comparison to Scotland where the reduction was 9% for the period. Despite this long term trend dressing covers have been relatively stable in the last 5 years. On grass, phosphate dressing covers have also declined since 2004, but these too have stabilised in more recent years.

Potash dressing covers follow a similar pattern to phosphate, with a marked decline on tillage crops in England and Wales since 2004 followed by stabilisation during the last 5 years.

Table B2.5a Phosphate dressing covers (%), Great Britain 2004 – 2015

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2015	43	85	49	35	65	41	39	72	45

Table B2.5b Potash dressing covers (%), Great Britain 2004 – 2015

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2015	45	88	50	35	65	42	40	73	46

B2.2.1 Phosphate and potash use on major tillage crops

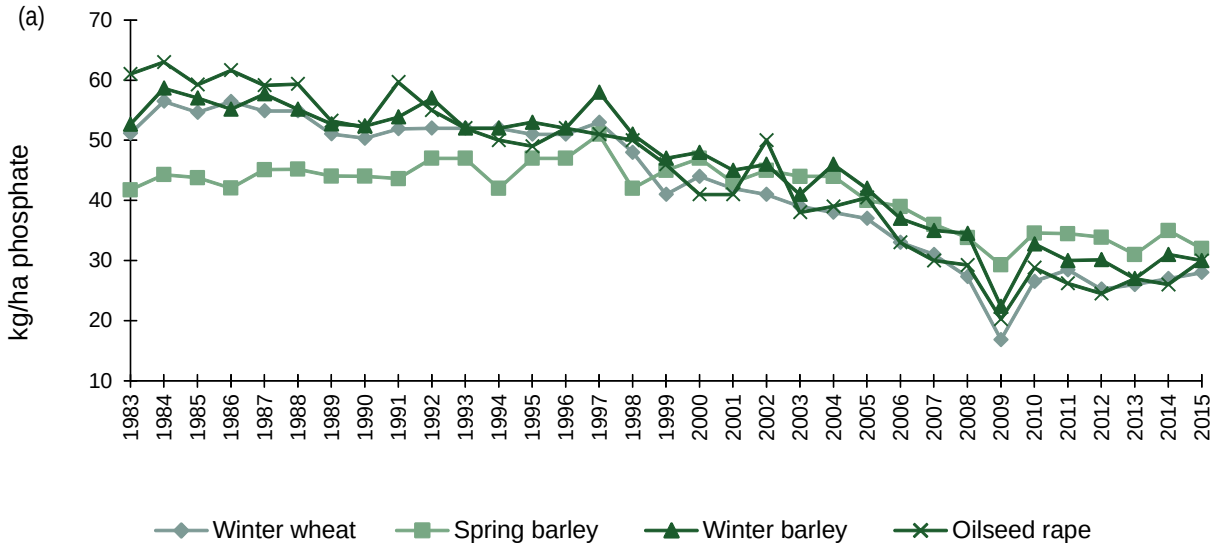
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

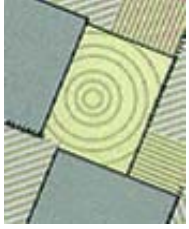
Phosphate use on most major tillage crops has shown a gradual net decline over the survey period. Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.5(a)). By 1999 the overall phosphate rate had fallen 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 32 kg/ha by 2015.

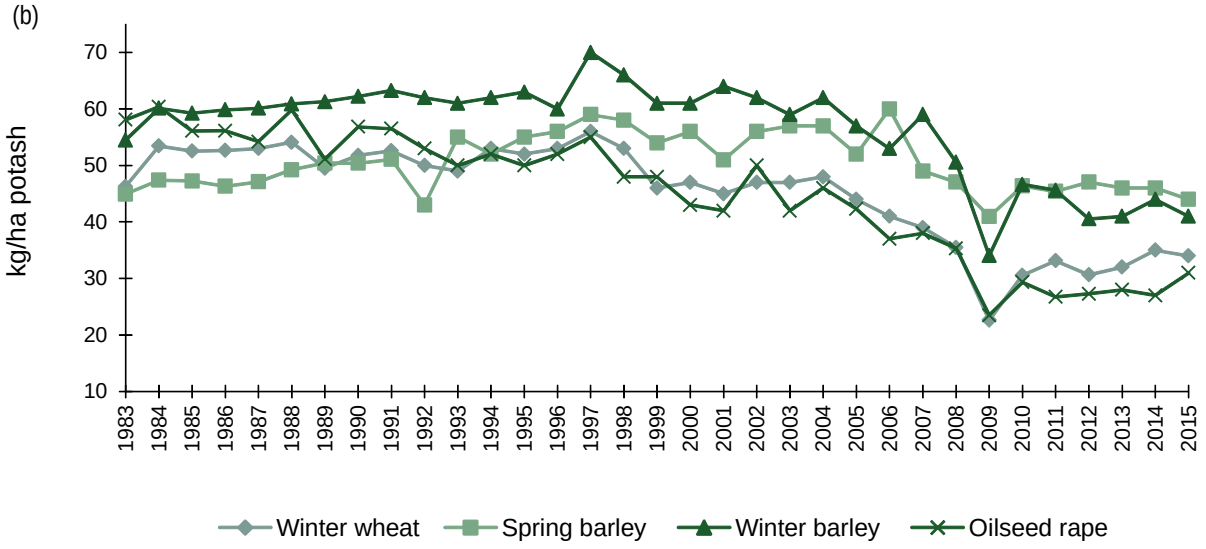
Overall phosphate use has also declined steadily on oilseed rape and sugar beet. Like other crops, the phosphate overall rate dipped in 2009, and as yet the rate on sugar beet has not regained the rate reported in 2008, which was 31 kg/ha.

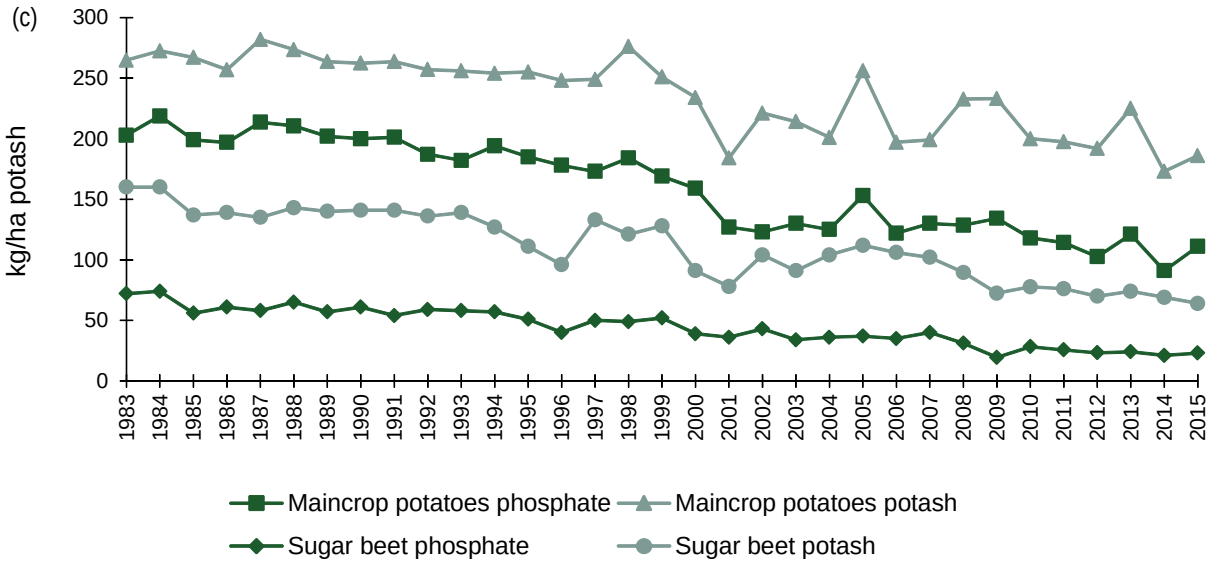
On winter wheat, the overall potash rates were fairly consistent between 1983 and 2005, in the range 44-56 kg/ha. Thereafter the rate declined, with a 2009 dip to 23 kg/ha, with modest recoveries since that point. For barley the rates were in the range of 49-61 kg/ha between 1983 and 2008. The rates 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 stabilisation.

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 – 2015





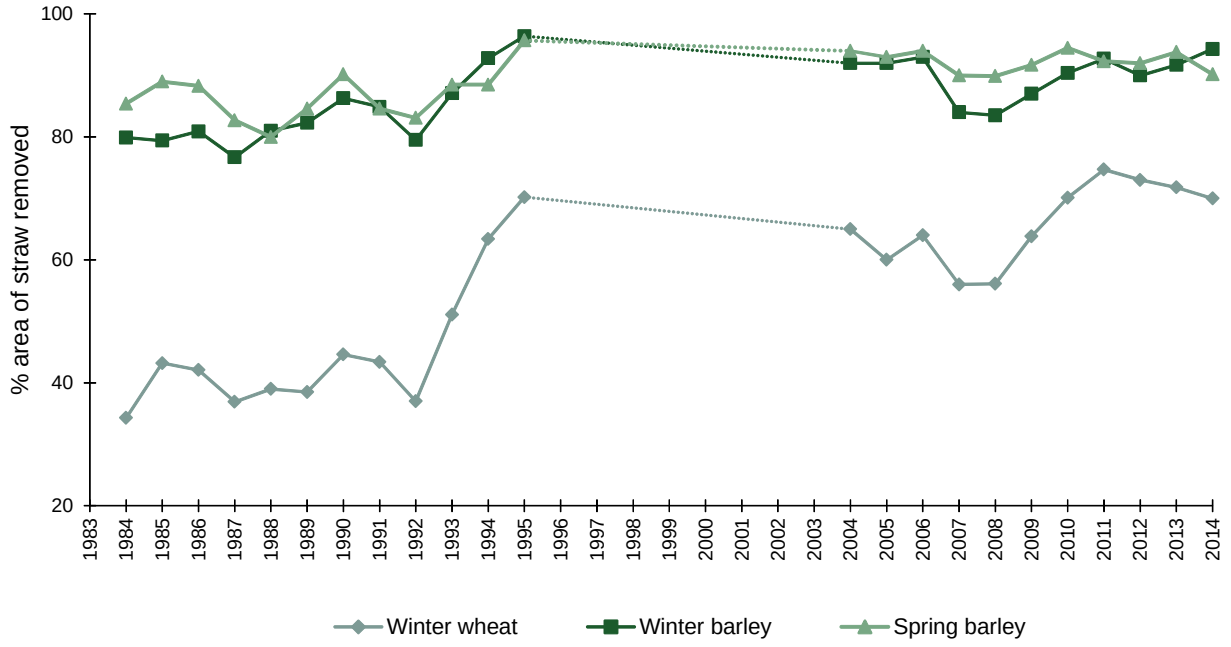

(b)
kg/ha potash
70
60
50
40
30
20
10
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Winter wheat
Spring barley
Winter barley
Oilseed rape


(c)
kg/ha potash
300
250
200
150
100
50
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Maincrop potatoes phosphate
Maincrop potatoes potash
Sugar beet phosphate
Sugar beet potash

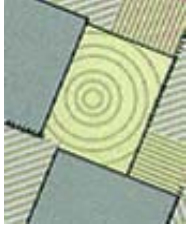
B2.3 STRAW REMOVAL

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_2O_5 (phosphate) per tonne, and 9.5-12.5 kg K_2O (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 2015 survey will relate to the fate of the straw from the 2014 harvest so is reported against 2014. In 2014 70% of the winter wheat straw was removed from the fields, with the percentages for winter and spring barley much higher at 94 and 90% 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 - 2014



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.

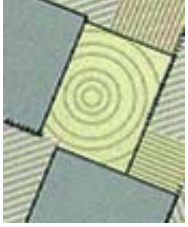


B2.4 TOTAL QUANTITIES OF NITROGEN PHOSPHATE AND POTASH, UK

Table B2.6 Quantities of major nutrients used, United Kingdom 1965-2014

	Nitrogen kt N				*Phosphate kt P_2O_5*				*Potash kt K_2O*			
	England & Wales	*Scotland*	*N. Ireland*	*UK*	*England & Wales*	*Scotland*	*N. Ireland*	*UK*	*England & Wales*	*Scotland*	*N. Ireland*	*UK*
1965	473	72	20	565	369	88	23	479	346	62	17	425
1966	491	76	23	590	332	81	22	435	335	61	18	413
1967	573	85	27	685	359	79	23	460	354	61	19	434
1968	625	93	29	748	367	81	21	469	362	62	18	441
1969	639	108	35	781	362	84	22	467	363	65	19	447
1970	653	108	34	796	366	81	23	470	356	63	20	438
1971	732	119	43	894	397	84	24	504	373	65	21	459
1972	751	120	48	919	371	76	24	470	336	60	19	416
1973	759	132	56	947	373	85	25	482	333	63	21	417
1974	784	139	57	980	357	72	21	449	347	55	19	421
1975	788	143	54	984	306	69	18	393	302	59	16	377
1976	851	144	65	1059	315	69	19	404	322	59	17	398
1977	879	146	68	1093	316	69	21	406	330	59	20	409
1978	924	156	75	1155	316	72	22	410	328	64	20	412
1979	941	160	85	1186	321	73	22	416	333	65	21	419
1980	1031	156	81	1268	342	75	24	440	361	65	22	447
1981	1100	159	76	1335	344	73	24	441	367	66	21	454
1982	1180	160	76	1416	357	65	24	446	394	67	22	483
1983	1227	161	82	1470	359	65	24	448	409	68	23	500
1984	1316	183	89	1588	391	69	28	488	457	73	29	559
1985	1298	186	96	1580	375	71	23	469	441	72	28	541
1986	1297	176	99	1572	341	65	28	434	415	66	29	510
1987	1370	193	111	1674	340	65	27	432	429	70	29	528
1988	1251	180	94	1525	341	70	24	435	419	76	29	524
1989	1223	193	98	1514	334	65	26	425	420	74	29	523
1990	1275	194	113	1582	323	63	28	414	409	73	33	515
1991	1224	193	98	1515	321	61	24	406	393	71	28	492
1992	1105	166	94	1365	295	55	21	371	351	64	26	441
1993	968	142	109	1219	286	50	24	360	344	57	29	430
1994	986	133	129	1248	312	51	28	391	361	59	38	458
1995	1064	156	128	1348	325	53	27	405	378	64	34	476
1996	1048	157	128	1333	302	62	30	394	370	65	36	471
1997	1156	172	112	1440	325	63	24	412	405	65	31	501
1998	1111	158	106	1375	308	56	19	383	397	64	26	487
1999	1015	152	117	1284	274	50	23	347	365	59	27	451
2000	1005	150	113	1268	237	59	21	317	322	61	26	409
2001	876	180	106	1162	201	57	21	279	274	69	26	369
2002	915	187	95	1197	209	55	19	283	397	70	24	391
2003	853	170	108	1131	203	60	19	282	283	66	26	375
2004	875	150	100	1125	205	57	16	278	288	65	22	375
2005	834	150	77	1061	192	55	12	259	267	67	18	352
2006	780	153	70	1003	173	51	11	235	243	66	16	325
2007	802	126	80	1008	169	46	9	224	241	59	17	317
2008	800	127	74	1001	160	49	6	215	244	68	13	325
2009	767	124	57	948	91	34	4	129	148	52	8	208
2010	813	127	76	1016	134	44	6	184	182	57	12	251
2011	824	124	74	1022	145	42	5	192	213	59	11	283
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
2014	838	151	71	1060	146	48	7	201	206	65	13	284
2015e	*819*	*155*	*75*	*1049*	*142*	*48*	*6*	*196*	*196*	*64*	*12*	*272*

Note: Years are harvest (e.g. 2015 refers to the 2014/15 cropping year) rather than calendar years. Data for 2015 are estimates.

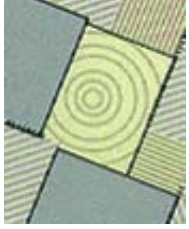


Quantities of nitrogen, phosphate and potash used in the UK since 1965 are shown in Table B2.6. These data are based on BSFP findings and trade and sales data. They are compiled by the Agricultural Industries Confederation in conjunction with Defra using the methodology described in Section A2.5. They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

Total nitrogen use in the UK increased from 565 thousand tonnes in 1965 up to 1674 thousand tonnes in 1987 before declining gradually to 1001 thousand tonnes in 2008. The drop in 2009 was related to high fertiliser prices. Between 2010 and 2015 nitrogen use has remained relatively stable.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 2015 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 2015 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.



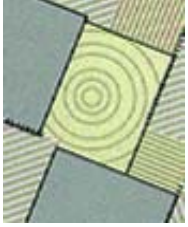
SECTION C – TABLES

CONTENTS

GREAT BRITAIN TABLES 2015

ENGLAND AND WALES TABLES 2015

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



SCOTLAND TABLES 2015

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 2015

	Crop area receiving dressing (%)					Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	SO_3	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	88	32	33	42	19	145	57	59	128	18	19	113
Winter wheat	99	44	46	62	21	193	64	73	190	28	34	1429
Spring barley	98	67	70	48	26	107	48	62	105	32	44	708
Winter barley	99	54	60	52	18	149	55	68	147	30	41	474
Oats	91	56	67	42	20	107	57	69	97	32	46	185
Rye/triticale/Durum wheat	68	8	34	52	28	100	-	82	68	-	28	14
Potatoes (seed or earlies)	99	81	95	19	28	143	145	198	142	118	187	20
Potatoes (maincrop)	95	76	81	23	36	166	145	230	157	111	186	84
Sugar beet	98	40	65	42	54	100	59	98	98	23	64	100
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	47	44	73	17	193	63	70	193	30	31	503
Linseed	100	27	30	35	12	81	57	54	81	15	16	33
Forage maize	86	59	27	18	89	71	43	75	61	25	21	205
Rootcrops for stockfeed	83	54	63	14	48	80	62	79	66	34	50	69
Leafy forage crops	68	63	63	22	45	74	33	48	51	21	30	45
Arable silage/other fodder crops	55	26	30	16	61	111	53	60	61	13	18	106
Peas - human consumption	1	27	26	4	4	-	78	96	-	21	25	44
Peas - animal consumption	3	29	45	4	12	-	44	56	-	13	25	35
Beans - animal consumption	2	31	32	5	4	-	56	66	-	18	21	222
Vegetables (brassicae)	83	76	83	0	17	146	80	82	122	61	68	10
Vegetables (other)	64	37	59	31	6	115	101	141	74	37	83	41
Soft Fruit	97	45	81	37	3	35	56	132	34	25	107	21
Top Fruit	90	33	58	32	7	74	21	75	67	7	44	28
Other tillage	32	22	12	14	17	62	41	88	20	9	11	55
All tillage	91	49	50	52	23	161	60	75	146	29	38	4547
Grass under 5 years old	85	55	58	19	53	122	28	45	104	16	26	956
Grass 5 years and over	55	38	38	8	29	84	20	25	46	8	10	2376
All grass	60	41	42	10	33	93	22	30	56	9	12	3332
All crops and grass	75	45	46	30	29	132	41	53	98	18	24	7879

Source: British Survey of Fertiliser Practice 2015

Table GB1.2 Use of straight fertiliser, Great Britain 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	80	11	12	148	72	64	119	8	8	113
Winter wheat	98	15	18	189	74	79	184	11	14	1429
Spring barley	75	9	12	95	57	72	72	5	9	708
Winter barley	97	13	19	144	53	67	139	7	13	474
Oats	82	8	20	100	53	71	82	4	15	185
Rye/triticale/Durum wheat	63	0	26	102	-	-	65	-	-	14
Potatoes (seed or earlies)	30	7	36	106	-	148	32	-	54	20
Potatoes (maincrop)	47	6	24	118	104	235	56	7	56	84
Sugar beet	92	7	36	96	83	103	88	6	37	100
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	99	14	21	186	67	70	185	9	15	503
Linseed	96	5	7	79	-	-	76	-	-	33
Forage maize	59	5	12	79	30	103	46	2	12	205
Rootcrops for stockfeed	32	1	12	101	-	138	32	-	16	69
Leafy forage crops	13	1	1	48	-	-	6	-	-	45
Arable silage/other fodder crops	45	4	8	114	-	-	51	-	-	106
Peas - human consumption	0	24	24	-	78	97	-	19	23	44
Peas - animal consumption	0	19	35	-	39	56	-	7	20	35
Beans - animal consumption	1	13	14	-	57	62	-	7	9	222
Vegetables (brassicae)	47	47	47	-	-	-	-	-	-	10
Vegetables (other)	57	10	40	114	42	122	65	4	49	41
Soft Fruit	97	45	81	35	56	132	34	25	107	21
Top Fruit	49	6	30	60	-	-	30	-	-	28
Other tillage	22	5	6	68	-	-	15	-	-	55
All tillage	84	12	18	159	67	81	134	8	14	4547
Grass under 5 years old	49	2	4	119	50	83	58	1	4	956
Grass 5 years and over	23	0	0	93	61	77	21	0	0	2376
All grass	27	1	1	100	56	81	27	0	1	3332
All crops and grass	54	6	9	144	66	81	77	4	7	7879

Source: British Survey of Fertiliser Practice 2015

Table GB1.3 Use of compound fertiliser, Great Britain 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	13	21	22	71	50	53	9	10	12	113
Winter wheat	10	30	28	58	59	68	6	17	19	1429
Spring barley	51	58	59	65	47	60	33	27	35	708
Winter barley	13	42	43	58	56	66	8	23	29	474
Oats	24	48	47	66	57	68	15	28	32	185
Rye/triticale/Durum wheat	4	8	8	-	-	-	-	-	-	14
Potatoes (seed or earlies)	93	81	62	118	144	216	110	117	133	20
Potatoes (maincrop)	70	70	66	144	149	195	102	104	130	84
Sugar beet	21	33	37	47	54	70	10	18	26	100
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	23	34	23	35	60	70	8	20	16	503
Linseed	8	22	22	-	45	48	-	10	11	33
Forage maize	56	55	17	26	43	50	15	24	9	205
Rootcrops for stockfeed	53	53	54	63	62	63	34	33	34	69
Leafy forage crops	61	61	61	72	33	48	44	20	29	45
Arable silage/other fodder crops	19	22	23	50	49	53	10	11	12	106
Peas - human consumption	1	3	2	-	-	-	-	-	-	44
Peas - animal consumption	3	10	10	-	52	55	-	5	5	35
Beans - animal consumption	0	18	18	-	56	69	-	10	13	222
Vegetables (brassicae)	36	29	36	48	-	59	17	-	21	10
Vegetables (other)	17	27	24	50	121	141	9	33	34	41
Soft Fruit	0	0	0	-	-	-	-	-	-	21
Top Fruit	54	27	54	69	-	50	37	-	27	28
Other tillage	16	17	6	34	44	85	5	7	5	55
All tillage	22	37	33	59	57	70	13	21	23	4547
Grass under 5 years old	52	53	54	87	27	41	45	14	22	956
Grass 5 years and over	38	38	38	65	19	25	25	7	9	2376
All grass	41	40	41	70	21	28	28	9	11	3332
All crops and grass	32	39	37	66	37	46	21	14	17	7879

Source: British Survey of Fertiliser Practice 2015

Table GB1.4 Use of lime, Great Britain 2015

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	3.8	-	0.7	-	3.2	7.6	4.5	-	3.0	-	0.4	2.6	10	113
Winter wheat	3.1	0.2	0.6	0.6	0.4	4.9	3.7	4.5	4.1	4.1	1.2	3.7	95	1429
Spring barley	7.6	0.4	2.1	-	1.2	11.3	4.0	4.0	4.7	-	0.5	3.7	100	708
Winter barley	6.6	1.1	0.6	0.1	0.3	8.7	4.0	5.9	3.9	5.0	0.8	4.1	43	474
Oats	3.1	-	0.7	-	1.3	5.1	4.8	-	2.5	-	0.7	3.4	14	185
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	14
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	84
Sugar beet	5.5	1.2	-	18.5	-	25.2	4.2	3.7	-	5.8	-	5.3	25	100
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Winter oilseed rape	7.6	0.9	1.3	0.9	0.2	11.0	3.6	3.6	3.0	7.5	0.8	3.8	61	503
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	2	33
Forage maize	8.1	1.3	2.4	0.7	1.0	13.5	4.9	5.0	2.3	5.0	0.2	4.1	28	205
Rootcrops for stockfeed	15.5	-	1.0	0.6	4.6	21.6	6.4	-	5.0	7.0	0.5	5.1	14	69
Leafy forage crops	10.6	-	2.1	-	5.9	18.6	4.5	-	5.0	-	0.5	3.3	9	45
Arable silage/other fodder crops	6.2	-	1.0	-	0.4	7.6	4.7	-	2.4	-	0.7	4.2	22	106
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	1	44
Peas - animal consumption	15.4	-	-	-	-	15.4	5.3	-	-	-	-	5.3	5	35
Beans - animal consumption	2.7	-	0.2	0.5	0.1	3.5	3.6	-	2.3	7.5	0.3	4.0	6	222
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	4	10
Vegetables (other)	10.7	-	10.5	-	-	21.2	2.2	-	3.9	-	-	3.0	6	41
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	2	21
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	28
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	2	55
All tillage	5.2	0.5	1.0	0.8	0.6	8.0	3.9	4.5	3.8	5.5	0.7	3.9	452	4547
Grass under 5 years old	3.3	0.3	0.9	0.1	1.2	5.9	4.3	6.6	4.6	6.0	0.4	3.7	70	956
Grass 5 years and over	1.3	0.0	0.6	0.0	0.6	2.6	3.8	5.0	4.0	2.5	1.0	3.2	96	2376
All grass	1.7	0.1	0.7	0.0	0.7	3.1	4.0	6.0	4.1	4.2	0.8	3.4	166	3332
All crops and grass	3.3	0.3	0.8	0.4	0.6	5.4	3.9	4.7	4.0	5.5	0.7	3.7	618	7879

Source: British Survey of Fertiliser Practice 2015

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	52	36	35	20	74	18	19	38	6	7	1560
Grazed mown	70	48	50	53	108	26	38	76	12	19	1310
All grazings	58	40	40	31	87	21	27	51	8	11	2870
Cut for silage - grazed	80	56	59	63	115	26	40	92	15	23	969
Cut for silage - not grazed	90	55	61	72	136	28	48	123	16	29	320
All cut for silage	83	56	59	65	121	27	42	100	15	25	1289
Cut for hay - grazed	48	30	31	30	73	23	29	35	7	9	394
Cut for hay - not grazed	62	44	49	26	82	26	46	51	11	23	89
All cut for hay	50	32	34	29	75	23	33	37	8	11	483
All mowings	74	49	52	56	113	26	40	84	13	21	1713
All grass	60	41	42	33	93	22	30	56	9	12	3332

Source: British Survey of Fertiliser Practice 2015

Table GB3.0 Product use by month of application, Great Britain 2015

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	1	0	0	0	0	3	32	40	17	4	2	1
Straight P	16	7	3	1	0	12	31	16	6	1	4	3
Straight K	6	4	1	1	3	12	47	21	3	1	1	1
Compounds	7	4	1	0	1	2	21	36	15	6	3	4
All fertilisers	3	2	0	0	0	3	29	37	15	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	29	41	18	5	2	1
Phosphate	12	7	1	1	1	5	25	29	9	2	2	5
Potash	9	6	1	1	1	6	30	29	9	4	2	3
Total	3	2	0	0	0	4	28	38	15	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 2015.

'Nutrient' refers to the tonnage of each nutrient contained in the products used.

(e.g. 100 kg of a 20:10:10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B, Table B2.6.

Source: British Survey of Fertiliser Practice 2015

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2015

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	32.2	48.8	12.3	23.6	49.3	22.2	41.7	31.2	32.9	30.4	24.2	31.1	39.0
Urea	6.5	11.6	0.2	4.1	14.8	4.9	9.9	5.1	4.7	4.7	0.0	5.0	8.7
Calcium Ammonium Nitrate (CAN)	1.2	1.1	0.0	1.0	0.4	1.9	1.0	2.0	1.5	2.0	0.0	2.0	1.3
Urea Ammonium Nitrate (UAN)	8.0	12.0	2.2	9.0	12.6	4.5	10.3	1.6	3.1	1.5	30.4	2.0	8.2
Other Straight N	1.4	1.6	2.2	2.3	2.2	1.4	1.7	0.7	0.8	0.4	0.8	0.7	1.4
Triple Superphosphate (TSP)	2.3	3.1	1.8	0.6	3.1	5.8	3.1	0.7	0.2	0.5	4.7	0.7	2.5
Other Straight P	0.0	0.0	0.0	1.1	0.0	0.5	0.1	0.2	0.0	0.1	0.0	0.1	0.1
Muriate of Potash (MOP)	2.7	3.3	9.9	1.5	2.9	8.4	3.8	0.6	1.2	0.9	8.5	0.9	3.1
Other Straight K	0.2	0.2	0.8	18.4	0.3	4.0	1.1	0.1	0.2	0.1	0.0	0.1	0.9
PK	6.4	11.8	2.4	20.0	5.8	10.6	9.8	2.1	3.5	2.2	14.6	2.3	7.9
NK	3.1	1.0	2.4	2.2	0.7	4.0	1.6	5.2	2.6	7.6	0.0	5.4	2.6
Low N (<19% N)	17.5	2.9	60.4	10.9	6.3	19.6	9.8	3.4	3.5	3.0	11.5	3.6	8.3
High N (>=19% N)	18.2	2.4	4.9	3.1	0.5	11.1	5.5	47.1	46.0	46.4	5.3	45.9	15.7
Other	0.3	0.3	0.4	2.1	1.0	1.1	0.5	0.1	0.0	0.0	0.0	0.1	0.4
Total product ('000 tonnes)	**429**	**1713**	**88**	**64**	**521**	**142**	**2956**	**957**	**91**	**599**	**18**	**1167**	**4123**

Source: British Survey of Fertiliser Practice 2015

Table GB3.2 Use of product type by crop group, Great Britain 2015

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	11.5	65.1	0.7	1.3	18.4	2.9	77.2	80.7	6.8	51.0	1.1	22.8	1532
Urea	8.4	63.6	0.0	0.9	24.7	2.3	89.2	81.0	6.1	53.7	0.0	10.8	422
Calcium Ammonium Nitrate (CAN)	10.7	72.0	0.0	1.2	6.2	9.8	58.5	83.3	3.9	43.9	0.0	41.5	54
Urea Ammonium Nitrate (UAN)	10.4	64.1	0.6	1.5	21.6	2.0	95.1	58.9	10.1	39.4	28.8	4.9	400
Other Straight N	10.1	52.3	4.7	1.5	28.9	2.5	88.9	71.2	3.8	35.1	2.4	11.1	84
Triple Superphosphate (TSP)	11.7	61.4	1.0	0.8	16.0	9.1	92.1	89.2	0.5	38.6	8.9	7.9	100
Other Straight P	0.0	15.7	0.0	35.8	0.0	48.4	66.2	100.0	0.0	61.4	0.0	33.8	5
Muriate of Potash (MOP)	12.5	51.2	6.4	2.3	15.4	12.1	94.0	49.5	13.3	54.9	20.0	6.0	115
Other Straight K	2.1	16.3	2.5	50.9	3.2	24.9	96.6	100.0	7.6	100.0	0.0	3.4	30
PK	9.3	69.4	0.8	3.3	10.8	6.4	92.8	70.8	6.8	51.5	11.7	7.2	293
NK	35.2	31.8	9.3	3.1	8.3	12.3	47.0	75.7	3.8	81.5	0.0	53.0	112
Low N (<19% N)	34.9	17.9	22.5	2.4	13.5	8.9	87.8	74.0	12.3	47.3	4.2	12.2	262
High N (>=19% N)	55.9	25.7	5.8	1.6	2.3	8.6	15.4	85.5	8.9	49.6	0.4	84.6	697
Other	10.0	38.6	2.4	9.3	28.8	10.9	98.5	100.0	0.0	53.6	0.0	1.5	17
All Fertilisers	**14.5**	**57.9**	**3.0**	**2.2**	**17.6**	**4.8**	**71.7**	**82.0**	**7.8**	**51.4**	**1.5**	**28.3**	**4123**

Source: British Survey of Fertiliser Practice 2015

Table GB3.3 Product use by month of application, Great Britain 2015

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	2.5	30.4	39.9	17.7	5.6	2.2	1.2	0.4	0.2	0.0	0.0	1532
Urea	0.0	5.0	37.0	40.2	12.4	2.7	0.9	0.4	0.9	0.4	0.1	0.0	422
Calcium Ammonium Nitrate (CAN)	0.0	0.8	20.6	41.9	22.8	7.0	4.0	2.4	0.4	0.0	0.0	0.0	54
Urea Ammonium Nitrate (UAN)	0.0	3.9	30.1	44.0	19.1	1.4	0.3	0.4	0.5	0.2	0.0	0.0	400
Other Straight N	0.0	8.8	58.6	22.7	8.4	0.3	0.0	0.9	0.1	0.0	0.1	0.0	84
Triple Superphosphate (TSP)	0.4	12.1	33.0	14.9	5.9	0.3	3.9	3.1	15.6	7.5	2.6	0.6	100
Other Straight P	0.0	0.0	0.0	51.9	9.0	15.4	0.0	0.0	23.7	0.0	0.0	0.0	5
Muriate of Potash (MOP)	1.2	13.0	43.4	23.6	3.7	0.8	0.5	0.3	7.0	4.3	1.1	1.0	115
Other Straight K	12.1	6.0	60.0	12.3	2.3	1.2	1.7	2.2	0.0	1.7	0.5	0.0	30
PK	2.2	6.5	22.0	8.9	1.6	1.0	1.3	8.0	25.6	18.7	2.4	1.8	293
NK	0.0	1.9	21.9	18.6	29.1	16.9	5.9	5.5	0.0	0.2	0.0	0.0	112
Low N (<19% N)	0.7	1.6	29.2	44.6	6.6	1.6	0.5	7.0	5.9	1.9	0.5	0.0	262
High N (>=19% N)	0.0	0.5	16.2	46.8	21.7	8.8	4.0	1.6	0.4	0.0	0.0	0.0	697
Other	0.8	4.4	69.1	18.6	2.7	0.0	0.0	0.0	2.4	2.1	0.0	0.0	17
All Fertilisers	**0.3**	**3.4**	**28.9**	**37.4**	**15.5**	**4.8**	**2.1**	**2.1**	**3.2**	**1.9**	**0.3**	**0.2**	**4123**

Source: British Survey of Fertiliser Practice 2015

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	99	40	38	7	160	58	65	159	23	25	46
Winter wheat	99	49	47	15	199	65	71	198	32	34	645
Spring barley	100	61	62	12	112	51	71	112	31	44	194
Winter barley	99	64	67	4	152	56	69	151	36	46	164
Oats	100	55	67	17	106	62	65	106	34	44	61
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	2
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	3
Sugar beet	93	26	61	42	106	37	119	99	9	72	25
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	51	45	13	193	62	70	193	32	31	290
Linseed	100	30	32	6	83	56	51	83	17	16	22
Forage maize	87	55	32	94	95	52	90	83	28	29	19
Rootcrops for stockfeed	94	47	54	14	102	53	-	95	25	-	9
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	55	15	36	51	122	-	-	68	-	-	10
Peas - human consumption	4	42	17	16	-	-	-	-	-	-	11
Peas - animal consumption	0	25	45	7	-	63	58	-	16	26	21
Beans - animal consumption	2	29	31	0	-	60	65	-	17	20	118
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	56	36	20	0	-	-	-	-	-	-	7
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	49	37	7	42	44	-	-	21	-	-	12
All tillage	93	50	49	14	175	61	71	162	31	35	1669
Grass under 5 years old	74	45	47	10	125	39	73	92	17	35	91
Grass 5 years and over	36	14	16	6	71	24	38	26	3	6	261
All grass	43	20	22	6	88	30	53	38	6	11	352
All crops and grass	86	46	45	13	169	59	70	145	27	32	2021

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

Source: British Survey of Fertiliser Practice 2015

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	82	20	15	2	147	93	76	121	19	11	23
Winter wheat	100	38	45	13	191	67	77	190	25	35	340
Spring barley	99	57	63	11	112	43	59	110	24	37	121
Winter barley	100	51	59	3	138	55	66	138	28	39	85
Oats	91	29	67	0	111	37	73	101	11	49	27
Rye/triticale/Durum wheat	88	0	77	36	-	-	-	-	-	-	5
Potatoes (seed or earlies)	100	87	91	22	141	136	196	141	118	177	9
Potatoes (maincrop)	97	73	79	42	170	147	236	165	107	186	59
Sugar beet	100	47	71	55	98	63	92	98	30	66	65
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	40	45	20	199	69	74	199	28	33	102
Linseed	100	10	19	46	69	-	-	69	-	-	6
Forage maize	92	47	27	29	88	45	145	81	21	39	16
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	94	32	32	0	128	-	-	121	-	-	6
Peas - human consumption	0	23	31	0	-	96	101	-	22	31	29
Peas - animal consumption	10	47	60	32	-	-	52	-	-	31	9
Beans - animal consumption	0	40	41	6	-	50	73	-	20	29	47
Vegetables (brassicae)	78	69	78	22	189	-	92	148	-	72	8
Vegetables (other)	65	44	64	5	116	111	124	75	49	79	23
Soft Fruit	96	39	79	4	30	59	132	29	23	105	20
Top Fruit	91	35	57	7	75	21	71	68	8	40	26
Other tillage	36	22	23	1	82	35	92	30	8	21	30
All tillage	90	43	52	15	158	68	88	143	29	46	1062
Grass under 5 years old	76	41	43	15	97	24	40	73	10	17	60
Grass 5 years and over	41	22	24	6	74	23	30	30	5	7	139
All grass	47	26	27	8	80	23	33	37	6	9	199
All crops and grass	82	40	47	14	150	62	82	123	25	39	1261

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 2015

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	70	38	42	82	92	31	34	65	12	14	14
Winter wheat	91	30	31	63	189	60	73	172	18	23	83
Spring barley	93	65	71	76	83	40	43	77	26	31	60
Winter barley	100	36	51	47	130	47	73	130	17	38	35
Oats	55	32	32	65	91	-	-	50	-	-	14
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	2
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	58	45	35	206	-	-	206	-	-	8
Linseed	-	-	-	-	-	-	-	-	-	-	1
Forage maize	85	63	23	97	67	43	55	57	27	13	98
Rootcrops for stockfeed	91	19	19	93	-	-	-	-	-	-	5
Leafy forage crops	87	57	57	76	63	13	28	55	7	16	8
Arable silage/other fodder crops	44	21	13	79	111	53	35	49	11	5	50
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	0	25	25	33	-	-	-	-	-	-	8
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	3
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	83	47	38	73	118	48	59	98	22	22	400
Grass under 5 years old	91	44	52	85	159	29	55	144	13	28	232
Grass 5 years and over	85	49	53	61	132	22	33	113	11	17	371
All grass	87	47	53	68	140	24	39	122	11	20	603
All crops and grass	86	47	49	69	136	29	42	117	14	21	1003

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

Source: British Survey of Fertiliser Practice 2015

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	45	31	34	71	60	24	28	27	8	10	14
Winter wheat	81	37	38	46	158	51	66	128	19	25	58
Spring barley	95	82	83	56	89	46	52	84	38	44	133
Winter barley	88	53	53	56	142	48	58	124	25	31	55
Oats	80	68	63	50	93	50	61	74	34	38	34
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	86	73	26	98	55	38	47	47	28	12	33
Rootcrops for stockfeed	67	65	65	47	62	52	56	41	33	36	30
Leafy forage crops	69	67	67	44	80	36	49	55	24	33	24
Arable silage/other fodder crops	63	50	54	62	91	40	43	57	20	23	21
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	0	45	45	45	-	-	-	-	-	-	8
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	1
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	83	64	60	58	104	46	54	86	29	32	416
Grass under 5 years old	85	67	67	52	97	27	34	82	18	23	363
Grass 5 years and over	51	40	39	30	67	19	22	34	8	8	1255
All grass	54	43	41	32	72	20	24	39	9	10	1618
All crops and grass	57	44	43	34	75	23	27	43	10	11	2034

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 2015

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	85	24	40	34	125	53	57	107	13	22	15
Winter wheat	98	45	51	42	179	59	77	176	26	39	277
Spring barley	97	76	80	30	110	50	64	107	38	51	195
Winter barley	100	48	59	40	156	57	71	156	28	42	127
Oats	87	75	76	18	113	58	77	98	43	58	48
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	96	96	96	23	-	-	-	-	-	-	5
Potatoes (maincrop)	85	86	86	12	159	141	220	135	121	190	19
Sugar beet	100	15	29	71	91	-	-	91	-	-	6
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	40	41	31	190	61	75	190	24	31	90
Linseed	-	-	-	-	-	-	-	-	-	-	4
Forage maize	85	39	43	86	71	42	89	60	16	38	37
Rootcrops for stockfeed	99	67	77	69	82	96	97	81	64	75	21
Leafy forage crops	45	42	42	21	50	-	-	22	-	-	8
Arable silage/other fodder crops	62	33	46	63	102	61	56	64	20	26	18
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	4
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	4	27	26	7	-	53	66	-	14	17	41
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	90	20	90	5	-	-	-	-	-	-	6
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	1	0	0	27	-	-	-	-	-	-	9
All tillage	93	53	58	36	150	59	77	140	31	45	938
Grass under 5 years old	83	59	60	34	117	28	44	96	16	27	206
Grass 5 years and over	59	39	39	8	82	20	28	48	8	11	332
All grass	66	45	45	15	94	23	34	62	10	15	538
All crops and grass	80	49	52	27	129	43	60	103	21	31	1476

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

Source: British Survey of Fertiliser Practice 2015

Table EW1.1 Total fertiliser use, England & Wales 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	91	32	31	16	146	59	59	133	19	18	104
Winter wheat	98	42	43	21	193	63	72	190	27	31	1312
Spring barley	97	46	50	23	109	45	60	106	21	30	452
Winter barley	99	50	57	19	146	52	67	144	26	38	417
Oats	91	49	59	22	105	54	68	96	27	40	141
Rye/triticale/Durum wheat	68	8	34	28	100	-	82	68	-	28	14
Potatoes (seed or earlies)	100	76	100	39	174	177	244	174	135	244	11
Potatoes (maincrop)	95	77	83	46	162	144	224	153	110	185	74
Sugar beet	98	39	64	54	100	59	98	98	23	63	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	100	45	42	18	192	62	70	192	28	29	465
Linseed	100	27	30	12	81	57	54	81	15	16	33
Forage maize	86	59	27	89	71	43	75	61	25	21	204
Rootcrops for stockfeed	80	47	57	47	83	46	74	66	22	42	50
Leafy forage crops	47	36	36	72	62	24	31	29	9	11	24
Arable silage/other fodder crops	48	21	25	61	111	53	67	53	11	17	89
Vining peas (for human consumption)	1	28	26	5	-	80	100	-	22	26	37
Field peas (harvested dry)	3	30	47	13	-	44	56	-	13	26	34
Field beans (harvested dry)	2	31	31	5	-	57	66	-	18	20	215
Vegetables (brassicae)	83	76	83	17	146	80	82	122	61	68	10
Vegetable Other	63	35	58	6	119	104	132	75	36	76	39
Soft Fruit	96	27	75	5	46	80	128	44	21	96	14
Top Fruit	90	33	58	7	74	22	75	67	7	44	27
Other tillage	33	23	13	18	62	41	88	21	9	11	52
All tillage	90	43	45	23	165	60	75	149	26	33	3920
Grass less than five years old	83	45	49	54	121	28	47	100	12	23	707
Grass five years and over	51	33	33	31	87	21	27	44	7	9	1972
All grass	56	35	35	35	94	22	31	53	8	11	2679
All crops and grass	73	39	40	29	138	43	56	100	17	22	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.2 Use of straight fertiliser, England & Wales 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	86	12	12	148	72	66	128	9	8	104
Winter wheat	97	14	17	190	72	79	185	10	14	1312
Spring barley	86	9	13	104	52	72	89	5	9	452
Winter barley	96	12	19	142	50	68	137	6	13	417
Oats	85	10	22	103	54	74	88	6	16	141
Rye/triticale/Durum wheat	63	0	26	102	-	-	65	-	-	14
Potatoes (seed or earlies)	30	12	21	-	-	-	-	-	-	11
Potatoes (maincrop)	51	7	26	107	90	233	55	6	60	74
Sugar beet	91	7	36	96	83	103	88	6	37	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	99	14	20	186	66	70	185	9	14	465
Linseed	96	5	7	79	-	-	76	-	-	33
Forage maize	59	5	12	79	30	103	46	2	12	204
Rootcrops for stockfeed	37	1	14	101	-	138	37	-	19	50
Leafy forage crops	10	0	0	-	-	-	-	-	-	24
Arable silage/other fodder crops	41	1	6	112	-	-	46	-	-	89
Peas - human consumption	0	25	24	-	81	101	-	20	25	37
Peas - animal consumption	0	20	37	-	39	56	-	8	21	34
Beans - animal consumption	1	13	13	-	57	62	-	8	8	215
Vegetables (brassicae)	47	47	47	-	-	-	-	-	-	10
Vegetables (other)	59	10	42	114	42	122	67	4	51	39
Soft Fruit	96	27	75	46	80	128	44	21	96	14
Top Fruit	49	6	29	60	-	-	30	-	-	27
Other tillage	22	5	6	68	-	-	15	-	-	52
All tillage	86	12	18	164	66	81	140	8	14	3920
Grass under 5 years old	53	2	5	121	57	87	65	1	4	707
Grass 5 years and over	23	1	0	97	65	83	22	0	0	1972
All grass	28	1	1	104	62	86	29	0	1	2679
All crops and grass	56	7	9	149	65	81	84	4	8	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.3 Use of compound fertiliser, England & Wales 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	10	20	21	54	51	51	6	10	11	104
Winter wheat	9	28	27	58	58	67	5	16	18	1312
Spring barley	26	36	37	64	43	56	16	16	21	452
Winter barley	11	37	39	62	53	65	7	20	25	417
Oats	13	39	36	62	54	65	8	21	24	141
Rye/triticale/Durum wheat	4	8	8	-	-	-	-	-	-	14
Potatoes (seed or earlies)	97	76	85	159	174	237	155	133	202	11
Potatoes (maincrop)	70	70	66	140	149	188	98	104	125	74
Sugar beet	21	32	37	47	54	71	10	17	26	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	20	32	22	36	59	70	7	19	15	465
Linseed	8	22	22	-	45	48	-	10	11	33
Forage maize	56	54	17	26	43	50	15	24	9	204
Rootcrops for stockfeed	46	46	46	63	46	51	29	21	23	50
Leafy forage crops	36	36	36	64	24	31	23	9	11	24
Arable silage/other fodder crops	15	20	19	45	52	62	7	10	12	89
Peas - human consumption	1	3	2	-	-	-	-	-	-	37
Peas - animal consumption	3	10	10	-	52	55	-	5	6	34
Beans - animal consumption	0	18	18	-	56	69	-	10	12	215
Vegetables (brassicae)	36	29	36	48	-	59	17	-	21	10
Vegetables (other)	15	25	22	52	128	117	8	32	25	39
Soft Fruit	0	0	0	-	-	-	-	-	-	14
Top Fruit	54	27	54	69	-	50	37	-	27	27
Other tillage	17	17	7	34	44	85	6	8	6	52
All tillage	16	31	28	56	58	69	9	18	19	3920
Grass under 5 years old	44	43	44	81	26	42	35	11	19	707
Grass 5 years and over	33	32	33	67	20	26	22	7	9	1972
All grass	34	34	34	70	21	29	24	7	10	2679
All crops and grass	25	32	31	66	38	47	16	12	15	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.4 Use of lime, England & Wales 2015

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	2.5	-	0.7	-	-	3.2	4.1	-	3.0	-	-	3.8	7	104
Winter wheat	3.2	0.2	0.2	0.7	0.3	4.6	3.7	4.5	2.6	4.1	1.5	3.6	84	1312
Spring barley	7.2	0.7	0.1	-	0.8	8.7	3.4	4.0	5.0	-	0.5	3.2	47	452
Winter barley	7.1	1.2	0.4	0.2	0.1	9.0	4.0	5.9	3.9	5.0	0.6	4.2	37	417
Oats	0.7	-	1.0	-	0.5	2.3	4.3	-	2.5	-	0.7	2.7	7	141
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	14
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	11
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	74
Sugar beet	5.5	1.2	-	18.6	-	25.4	4.2	3.7	-	5.8	-	5.3	25	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Winter oilseed rape	7.9	0.9	1.0	1.0	0.3	11.1	3.6	3.6	3.2	7.5	0.8	3.8	57	465
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	2	33
Forage maize	8.1	1.3	2.4	0.7	1.0	13.5	4.9	5.0	2.3	5.0	0.2	4.1	28	204
Rootcrops for stockfeed	18.0	-	-	0.7	3.7	22.4	6.4	-	-	7.0	0.6	5.4	10	50
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	3	24
Arable silage/other fodder crops	6.8	-	0.2	-	0.2	7.3	4.7	-	2.7	-	1.3	4.6	19	89
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	1	37
Peas - animal consumption	16.0	-	-	-	-	16.0	5.3	-	-	-	-	5.3	5	34
Beans - animal consumption	2.8	-	-	0.5	0.1	3.4	3.6	-	-	7.5	0.3	4.1	5	215
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	4	10
Vegetables (other)	7.8	-	10.8	-	-	18.6	2.7	-	3.9	-	-	3.4	5	39
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	2	14
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	2	52
All tillage	5.1	0.6	0.5	0.9	0.3	7.4	3.8	4.5	3.0	5.5	0.9	3.9	353	3920
Grass under 5 years old	4.4	0.5	0.3	0.1	0.6	5.8	4.3	6.6	4.1	6.0	0.4	4.1	51	707
Grass 5 years and over	1.5	0.0	0.4	0.0	0.4	2.4	3.9	5.0	4.1	2.5	1.3	3.5	71	1972
All grass	1.9	0.1	0.4	0.0	0.4	2.9	4.0	6.0	4.1	4.2	1.1	3.7	122	2679
All crops and grass	3.5	0.3	0.5	0.4	0.4	5.1	3.9	4.7	3.5	5.5	1.0	3.8	475	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	9	1	6	2	4	13	27	13	16	3	3	1	0	3	-	-	-	-	104
Winter wheat	2	0	0	2	3	4	8	15	20	22	13	8	3	1	-	-	-	-	1312
Spring barley	3	1	5	12	14	30	24	9	1	0	1	-	-	-	-	-	-	-	452
Winter barley	1	1	1	4	5	13	25	29	15	3	1	0	1	-	-	-	-	-	417
Oats	9	1	7	8	17	24	29	5	-	-	-	-	-	-	-	-	-	-	141
Rye/triticale/Durum wheat	32	0	16	0	18	4	26	4	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	0	0	0	0	12	0	18	9	27	21	0	12	-	-	-	-	-	-	11
Potatoes (maincrop)	5	0	2	1	20	7	12	20	10	7	7	1	2	0	6	-	-	-	74
Sugar beet	2	2	6	17	18	39	13	3	-	-	-	-	-	-	-	-	-	-	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	0	0	0	3	3	5	7	11	18	28	15	7	2	-	-	-	-	-	465
Linseed	0	7	3	31	26	28	5	-	-	-	-	-	-	-	-	-	-	-	33
Forage maize	14	21	13	14	18	9	7	4	1	1	-	-	-	-	-	-	-	-	204
Rootcrops for stockfeed	20	4	4	34	15	6	12	2	0	0	2	-	-	-	-	-	-	-	50
Leafy forage crops	53	4	14	14	8	7	-	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	52	6	2	2	2	15	15	2	3	1	1	-	-	-	-	-	-	-	89
Peas - human consumption	99	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Peas - animal consumption	97	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
Beans - animal consumption	98	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	215
Vegetables (brassicae)	17	0	29	0	7	0	0	0	0	33	0	14	-	-	-	-	-	-	10
Vegetables (other)	37	3	3	3	6	21	4	23	-	-	-	-	-	-	-	-	-	-	39
Soft Fruit	4	0	83	0	13	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Top Fruit	10	3	32	5	13	38	-	-	-	-	-	-	-	-	-	-	-	-	27
Other tillage	67	9	5	7	5	4	3	-	-	-	-	-	-	-	-	-	-	-	52
All tillage	10	1	2	4	6	9	12	13	13	14	8	5	2	1	-	-	-	-	3920
Grass under 5 years old	17	5	13	8	10	9	9	9	6	7	4	2	2	-	-	-	-	-	707
Grass 5 years and over	49	3	12	12	8	5	4	2	2	1	0	1	-	-	-	-	-	-	1972
All grass	44	3	12	12	8	5	5	3	2	2	1	1	-	-	-	-	-	-	2679
All crops and grass	27	2	7	8	7	7	8	8	8	8	4	3	1	1	-	-	-	-	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	68	4	9	13	4	1	0	0	1	-	-	-	-	-	-	-	-	-	104
Winter wheat	58	2	10	18	8	2	1	-	-	-	-	-	-	-	-	-	-	-	1312
Spring barley	54	7	15	22	1	-	-	-	-	-	-	-	-	-	-	-	-	-	452
Winter barley	50	7	13	23	6	1	-	-	-	-	-	-	-	-	-	-	-	-	417
Oats	51	4	15	22	7	1	-	-	-	-	-	-	-	-	-	-	-	-	141
Rye/triticale/Durum wheat	92	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	24	0	0	0	6	0	18	12	27	0	0	12	-	-	-	-	-	-	11
Potatoes (maincrop)	23	0	4	0	25	5	5	19	2	1	8	7	-	-	-	-	-	-	74
Sugar beet	61	12	8	3	8	8	-	-	-	-	-	-	-	-	-	-	-	-	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	55	5	9	16	13	2	-	-	-	-	-	-	-	-	-	-	-	-	465
Linseed	73	0	14	7	2	5	-	-	-	-	-	-	-	-	-	-	-	-	33
Forage maize	41	21	9	25	3	1	-	-	-	-	-	-	-	-	-	-	-	-	204
Rootcrops for stockfeed	53	4	22	14	7	-	-	-	-	-	-	-	-	-	-	-	-	-	50
Leafy forage crops	64	24	4	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	79	2	8	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	89
Peas - human consumption	72	0	7	7	8	0	0	5	-	-	-	-	-	-	-	-	-	-	37
Peas - animal consumption	70	14	5	8	1	0	0	0	0	2	-	-	-	-	-	-	-	-	34
Beans - animal consumption	69	3	5	19	4	-	-	-	-	-	-	-	-	-	-	-	-	-	215
Vegetables (brassicae)	24	0	24	5	0	47	-	-	-	-	-	-	-	-	-	-	-	-	10
Vegetables (other)	65	4	2	7	3	13	0	0	0	0	6	-	-	-	-	-	-	-	39
Soft Fruit	73	0	13	0	2	12	-	-	-	-	-	-	-	-	-	-	-	-	14
Top Fruit	67	16	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Other tillage	77	6	10	4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	52
All tillage	57	5	10	17	7	2	-	-	-	-	-	-	-	-	-	-	-	-	3920
Grass under 5 years old	55	26	13	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	707
Grass 5 years and over	67	22	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1972
All grass	65	22	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2679
All crops and grass	61	14	10	9	4	1	-	-	-	-	-	-	-	-	-	-	-	-	6599

Source: British Survey of Fertiliser Practice 2015

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	69	4	6	14	5	1	1	-	-	-	-	-	-	-	-	-	-	-	104
Winter wheat	57	3	8	13	12	5	2	1	-	-	-	-	-	-	-	-	-	-	1312
Spring barley	50	4	15	16	10	6	-	-	-	-	-	-	-	-	-	-	-	-	452
Winter barley	43	4	15	16	12	8	0	1	-	-	-	-	-	-	-	-	-	-	417
Oats	41	3	14	20	12	8	0	2	-	-	-	-	-	-	-	-	-	-	141
Rye/triticale/Durum wheat	66	0	2	8	11	12	-	-	-	-	-	-	-	-	-	-	-	-	14
Potatoes (seed or earlies)	0	0	0	0	0	0	0	3	21	31	0	27	0	0	0	6	12	-	11
Potatoes (maincrop)	17	0	0	2	9	1	9	8	1	8	7	10	5	15	3	2	3	-	74
Sugar beet	36	5	5	11	16	5	9	10	4	-	-	-	-	-	-	-	-	-	99
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	58	2	8	14	11	5	2	-	-	-	-	-	-	-	-	-	-	-	465
Linseed	70	0	14	10	6	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Forage maize	73	5	3	7	8	1	2	2	-	-	-	-	-	-	-	-	-	-	204
Rootcrops for stockfeed	43	2	22	12	6	1	9	0	5	-	-	-	-	-	-	-	-	-	50
Leafy forage crops	64	18	4	11	3	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	75	3	6	7	6	0	0	2	-	-	-	-	-	-	-	-	-	-	89
Peas - human consumption	74	0	0	6	9	5	3	2	-	-	-	-	-	-	-	-	-	-	37
Peas - animal consumption	53	2	27	6	9	2	0	1	-	-	-	-	-	-	-	-	-	-	34
Beans - animal consumption	69	2	5	12	8	3	-	-	-	-	-	-	-	-	-	-	-	-	215
Vegetables (brassicae)	17	0	0	31	38	14	-	-	-	-	-	-	-	-	-	-	-	-	10
Vegetables (other)	42	1	6	1	0	17	7	15	3	7	-	-	-	-	-	-	-	-	39
Soft Fruit	25	0	0	0	0	50	13	0	12	-	-	-	-	-	-	-	-	-	14
Top Fruit	42	5	11	25	0	8	0	9	-	-	-	-	-	-	-	-	-	-	27
Other tillage	87	2	2	0	3	1	3	1	1	-	-	-	-	-	-	-	-	-	52
All tillage	55	3	9	13	11	5	2	1	-	-	-	-	-	-	-	-	-	-	3920
Grass under 5 years old	51	18	11	7	6	5	0	1	-	-	-	-	-	-	-	-	-	-	707
Grass 5 years and over	67	18	11	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1972
All grass	65	18	11	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2679
All crops and grass	60	11	10	7	6	3	1	1	-	-	-	-	-	-	-	-	-	-	6599

Source: British Survey of Fertiliser Practice 2015

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	46	29	28	21	77	20	21	35	6	6	1213
Grazed mown	68	44	46	54	105	25	38	71	11	18	1180
All grazings	54	34	34	33	90	22	29	48	8	10	2393
Cut for silage - grazed	78	51	54	65	113	26	40	88	13	22	859
Cut for silage - not grazed	90	39	45	75	143	23	45	129	9	20	167
All cut for silage	80	49	53	67	119	26	41	95	13	22	1026
Cut for hay - grazed	47	30	31	30	72	22	29	34	7	9	373
Cut for hay - not grazed	58	38	43	26	84	24	49	49	9	21	75
All cut for hay	49	31	32	30	74	23	32	36	7	10	448
All mowings	70	43	46	56	110	25	40	78	11	18	1416
All grass	56	35	35	35	94	22	31	53	8	11	2679

Source: British Survey of Fertiliser Practice 2015

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	54	3	13	12	5	3	3	1	1	1	1	1	-	-	-	-	-	-	1213
Grazed mown	32	2	11	11	12	8	7	5	4	3	2	1	1	1	-	-	-	-	1180
All grazings	46	3	13	12	8	5	5	3	2	1	1	1	-	-	-	-	-	-	2393
Cut for silage - grazed	22	2	10	12	14	10	9	7	5	4	2	1	1	1	-	-	-	-	859
Cut for silage - not grazed	10	3	5	8	15	9	6	10	9	16	3	3	3	1	1	-	-	-	167
All cut for silage	20	2	9	11	14	10	9	8	5	6	2	1	1	1	-	-	-	-	1026
Cut for hay - grazed	53	2	17	9	10	4	3	1	1	1	-	-	-	-	-	-	-	-	373
Cut for hay - not grazed	42	4	11	11	12	9	8	1	0	0	1	1	-	-	-	-	-	-	75
All cut for hay	51	2	16	9	10	5	3	1	1	1	-	-	-	-	-	-	-	-	448
All mowings	30	2	11	11	13	8	7	6	4	4	2	1	1	1	-	-	-	-	1416
All grass	44	3	12	12	8	5	5	3	2	2	1	1	-	-	-	-	-	-	2679

Source: British Survey of Fertiliser Practice 2015

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	71	21	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1213
Grazed mown	56	25	16	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1180
All grazings	66	22	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2393
Cut for silage - grazed	49	28	19	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	859
Cut for silage - not grazed	61	27	9	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	167
All cut for silage	51	28	17	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1026
Cut for hay - grazed	70	19	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	373
Cut for hay - not grazed	62	17	20	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
All cut for hay	69	19	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	448
All mowings	57	25	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1416
All grass	65	22	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2679

Source: British Survey of Fertiliser Practice 2015

Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	72	18	8	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1213
Grazed mown	54	19	16	4	4	3	0	1	-	-	-	-	-	-	-	-	-	-	1180
All grazings	66	19	11	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2393
Cut for silage - grazed	46	21	19	5	4	3	0	1	-	-	-	-	-	-	-	-	-	-	859
Cut for silage - not grazed	55	16	13	6	5	3	0	0	1	-	-	-	-	-	-	-	-	-	167
All cut for silage	47	20	18	5	5	3	0	1	-	-	-	-	-	-	-	-	-	-	1026
Cut for hay - grazed	69	16	12	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	373
Cut for hay - not grazed	57	14	10	6	9	5	-	-	-	-	-	-	-	-	-	-	-	-	75
All cut for hay	68	15	12	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	448
All mowings	54	18	16	4	4	3	0	1	-	-	-	-	-	-	-	-	-	-	1416
All grass	65	18	11	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2679

Source: British Survey of Fertiliser Practice 2015

Table EW3.0 Product use by month of application, England & Wales 2015

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	1	0	0	0	0	3	34	40	16	4	2	1
Straight P	19	6	3	1	0	12	34	12	6	1	3	4
Straight K	5	4	1	1	4	12	49	18	3	1	1	1
Compounds	8	6	1	1	1	3	25	28	14	6	3	5
All fertilisers	3	2	0	0	0	4	32	35	14	4	2	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	3	31	41	16	5	2	1
Phosphate	14	8	2	1	1	6	29	21	9	2	2	6
Potash	9	7	1	1	2	7	34	22	8	4	2	3
Total	4	2	0	0	0	4	32	35	14	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 2015.

'Nutrient' refers to the tonnage of each nutrient contained in the products used.

(e.g. 100 kg of a 20:10:10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B, Table B2.6.

Source: British Survey of Fertiliser Practice 2015

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2015

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	39.2	49.6	13.2	24.1	50.6	25.0	44.1	34.6	35.7	35.9	24.9	36.1	42.2
Urea	7.7	11.3	0.2	4.2	14.1	5.3	10.1	5.5	4.6	5.0	0.0	5.4	9.0
Calcium Ammonium Nitrate (CAN)	1.2	1.2	0.0	1.0	0.4	2.0	1.1	2.1	1.1	2.1	0.0	1.9	1.3
Urea Ammonium Nitrate (UAN)	11.8	12.5	2.7	8.3	12.7	5.3	11.3	1.8	3.5	1.8	31.2	2.3	9.2
Other Straight N	1.6	1.5	0.9	2.4	2.1	1.0	1.6	0.7	0.9	0.5	0.9	0.8	1.4
Triple Superphosphate (TSP)	2.7	2.9	1.7	0.6	3.1	6.6	3.1	0.8	0.2	0.7	4.8	0.8	2.6
Other Straight P	0.0	0.0	0.0	1.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1
Muriate of Potash (MOP)	3.1	3.2	9.5	1.6	2.9	9.6	3.9	0.5	0.8	0.8	8.7	0.9	3.2
Other Straight K	0.3	0.2	0.9	18.1	0.4	3.7	1.2	0.1	0.2	0.2	0.0	0.1	0.9
PK	8.2	11.6	2.9	20.1	6.3	12.0	10.3	2.3	4.0	2.2	14.9	2.5	8.5
NK	1.5	1.0	2.9	2.2	0.7	4.3	1.4	6.0	2.9	9.0	0.0	6.3	2.5
Low N (<19% N)	6.1	2.0	60.4	11.2	5.1	15.2	6.8	3.0	2.6	2.1	9.2	2.9	5.9
High N (>=19% N)	16.1	2.5	4.0	3.1	0.6	8.6	4.5	42.2	43.5	39.8	5.4	39.8	12.6
Other	0.5	0.3	0.5	2.1	1.1	1.2	0.6	0.1	0.0	0.1	0.0	0.1	0.5
Total product ('000 tonnes)	**252**	**1550**	**63**	**63**	**487**	**128**	**2544**	**733**	**82**	**448**	**18**	**856**	**3401**

Source: British Survey of Fertiliser Practice 2015

Table EW3.2 Use of product type by crop group, England & Wales 2015

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	9.4	66.4	0.6	1.4	19.1	3.1	78.6	81.5	7.8	52.9	1.3	21.4	1368
Urea	6.9	63.6	0.0	1.1	26.1	2.4	90.1	85.4	7.1	52.6	0.0	9.9	368
Calcium Ammonium Nitrate (CAN)	8.7	74.5	0.0	1.3	6.6	8.9	65.5	94.2	3.8	45.4	0.0	34.5	45
Urea Ammonium Nitrate (UAN)	10.5	63.4	0.6	1.4	22.0	2.0	95.7	60.7	12.1	37.3	34.4	4.3	379
Other Straight N	7.7	54.0	0.7	2.0	33.2	2.4	88.3	70.6	4.6	36.9	2.8	11.7	66
Triple Superphosphate (TSP)	8.9	62.0	0.9	1.0	16.9	10.2	91.2	89.1	0.5	39.5	9.2	8.8	87
Other Straight P	0.0	24.1	0.0	55.0	0.0	20.9	65.9	100.0	0.0	41.4	0.0	34.1	3
Muriate of Potash (MOP)	9.5	52.9	5.4	2.6	16.1	13.4	93.9	51.2	13.2	54.7	22.9	6.1	99
Other Straight K	2.3	17.4	2.7	53.5	3.5	20.6	96.3	100.0	7.6	100.0	0.0	3.7	28
PK	8.9	67.8	0.9	3.6	12.0	6.9	93.9	83.2	9.1	44.3	15.7	6.1	260
NK	9.4	39.6	14.9	4.9	12.8	18.4	39.0	79.3	4.4	83.4	0.0	61.0	85
Low N (<19% N)	10.4	22.3	29.0	4.5	20.1	13.7	84.8	87.4	13.6	42.2	5.1	15.2	141
High N (>=19% N)	38.6	37.6	8.0	2.4	3.4	9.9	15.9	91.1	12.2	49.8	0.6	84.1	455
Other	10.0	38.6	2.4	9.3	28.8	10.9	98.5	100.0	0.0	53.6	0.0	1.5	17
All Fertilisers	**9.9**	**60.9**	**2.5**	**2.5**	**19.2**	**5.0**	**74.8**	**85.6**	**9.6**	**52.3**	**2.0**	**25.2**	**3401**

Source: British Survey of Fertiliser Practice 2015

Table EW3.3 Product use by month of application, England & Wales 2015

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	2.6	32.1	40.3	16.0	5.2	2.1	1.2	0.5	0.2	0.0	0.0	1368
Urea	0.0	5.7	38.2	40.0	11.2	2.6	1.0	0.3	0.9	0.1	0.0	0.0	368
Calcium Ammonium Nitrate (CAN)	0.1	1.0	21.7	43.2	24.4	4.7	3.6	0.9	0.5	0.0	0.0	0.0	45
Urea Ammonium Nitrate (UAN)	0.0	3.7	30.8	43.9	19.1	1.3	0.2	0.3	0.5	0.2	0.0	0.0	379
Other Straight N	0.0	5.5	65.3	23.1	4.4	0.4	0.0	1.1	0.1	0.0	0.2	0.0	66
Triple Superphosphate (TSP)	0.5	12.6	35.4	11.7	6.0	0.3	3.0	3.6	17.3	5.8	3.0	0.7	87
Other Straight P	0.0	0.0	0.0	44.1	13.8	5.9	0.0	0.0	36.2	0.0	0.0	0.0	3
Muriate of Potash (MOP)	1.3	13.9	45.8	20.8	3.0	0.9	0.5	0.3	6.6	4.2	1.3	1.2	99
Other Straight K	13.0	6.5	62.9	7.3	2.4	1.3	1.8	2.4	0.0	1.8	0.5	0.0	28
PK	2.5	6.1	23.0	7.6	1.4	1.2	1.4	8.1	24.3	19.8	2.7	2.0	260
NK	0.0	2.6	27.7	17.2	19.4	21.0	5.1	7.1	0.0	0.0	0.0	0.0	85
Low N (<19% N)	1.4	2.4	38.2	26.6	7.9	2.4	0.1	10.2	8.2	1.9	0.9	0.0	141
High N (>=19% N)	0.0	0.7	21.8	42.2	21.4	7.6	3.9	1.8	0.6	0.0	0.0	0.0	455
Other	0.8	4.4	69.1	18.6	2.7	0.0	0.0	0.0	2.4	2.1	0.0	0.0	17
All Fertilisers	**0.4**	**3.7**	**32.1**	**35.3**	**14.3**	**4.4**	**1.9**	**2.1**	**3.3**	**2.0**	**0.4**	**0.2**	**3401**

Source: British Survey of Fertiliser Practice 2015

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2015

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
North West	All tillage	90	32	69	58	138	55	94	124	18	64	112
	All grass	70	44	45	47	107	24	34	75	10	15	290
	All crops and grass	73	42	49	49	113	28	47	82	12	23	402
North East	All tillage	92	61	67	15	181	66	84	166	40	56	211
	All grass	42	33	33	18	86	22	34	36	7	11	199
	All crops and grass	63	45	48	17	145	48	64	92	21	31	410
Eastern	All tillage	94	44	32	14	167	62	71	157	27	22	538
	All grass	47	17	14	6	74	25	40	35	4	6	77
	All crops and grass	87	40	29	13	160	60	69	140	24	20	615
Yorkshire and the Humber	All tillage	94	46	51	20	174	68	82	163	31	42	703
	All grass	59	32	34	37	93	26	31	54	8	10	268
	All crops and grass	83	42	46	25	156	58	70	130	24	32	971
West Midlands	All tillage	91	35	54	32	156	47	78	142	16	42	438
	All grass	62	38	41	36	84	20	29	52	8	12	238
	All crops and grass	77	36	47	34	128	34	58	98	12	27	676
East Midlands	All tillage	89	42	39	13	170	61	72	151	26	28	607
	All grass	48	24	23	27	82	18	25	39	4	6	191
	All crops and grass	77	37	35	17	155	53	63	120	20	22	798
South West	All tillage	86	45	45	36	142	56	68	122	25	31	713
	All grass	55	32	33	44	106	24	36	59	7	12	703
	All crops and grass	67	37	38	41	124	39	51	83	14	19	1416
South East	All tillage	86	39	37	26	180	58	65	155	22	24	470
	All grass	38	13	14	14	94	27	36	36	3	5	255
	All crops and grass	67	29	27	21	160	52	59	107	15	16	725
Wales	All tillage	94	50	56	51	116	56	74	109	28	42	128
	All grass	58	47	45	36	83	21	25	48	10	11	458
	All crops and grass	61	47	46	37	87	23	30	53	11	14	586

Source: British Survey of Fertiliser Practice 2015

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2015

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Wessex	All tillage	85	36	39	36	145	55	64	123	20	25	364
	All grass	47	15	16	42	111	31	41	52	5	6	266
	All crops and grass	66	26	28	39	134	48	58	89	12	16	630
Anglia	All tillage	94	44	32	14	167	62	71	157	27	22	538
	All grass	47	17	14	6	74	25	40	35	4	6	77
	All crops and grass	87	40	29	13	160	60	69	140	24	20	615
Northern	All tillage	90	45	56	31	164	57	73	147	26	41	188
	All grass	61	44	44	39	97	24	32	59	10	14	369
	All crops and grass	67	44	47	37	115	31	42	77	14	20	557
North East	All tillage	94	50	56	19	175	68	82	165	34	46	789
	All grass	62	35	38	34	91	25	30	56	9	11	339
	All crops and grass	83	41	50	24	154	56	69	128	26	34	1128
North Mercia	All tillage	89	28	61	38	151	49	90	135	13	55	226
	All grass	65	31	36	43	111	19	36	72	6	13	179
	All crops and grass	75	30	46	41	130	30	65	98	9	30	405
South Mercia	All tillage	90	41	48	26	162	54	78	145	22	38	307
	All grass	43	28	29	19	60	24	31	26	7	9	132
	All crops and grass	71	36	40	23	136	44	64	96	16	26	439
East Midland	All tillage	89	42	39	13	170	61	72	151	26	28	607
	All grass	48	24	23	27	82	18	25	39	4	6	191
	All crops and grass	77	37	35	17	155	53	63	120	20	22	798
South East	All tillage	86	39	37	26	180	58	65	155	22	24	470
	All grass	38	13	14	14	94	27	36	36	3	5	255
	All crops and grass	67	29	27	21	160	52	59	107	15	16	725
South West	All tillage	89	63	59	42	127	54	73	113	34	43	303
	All grass	62	44	45	48	105	22	35	65	10	16	413
	All crops and grass	68	48	49	47	112	32	46	76	15	22	716
Wales	All tillage	94	50	56	51	116	56	74	109	28	42	128
	All grass	58	47	45	36	83	21	25	48	10	11	458
	All crops and grass	61	47	46	37	87	23	30	53	11	14	586

Source: British Survey of Fertiliser Practice 2015

Table SC1.1 Total fertiliser use, Scotland 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Winter wheat	100	74	77	18	188	71	80	188	52	62	117
Spring barley	99	97	98	30	104	50	64	103	49	63	256
Winter barley	100	89	87	16	172	67	75	172	59	66	57
Oats	91	72	86	15	110	61	70	101	44	60	44
Potatoes	96	80	80	6	150	133	200	144	107	160	19
Winter oilseed rape	100	82	80	6	206	72	73	206	60	59	38
Other crops	61	54	67	26	85	52	79	52	28	53	96
All tillage	96	85	88	23	136	60	74	130	51	65	627
Grass less than five years old	90	78	79	50	124	29	41	112	23	32	249
Grass five years and over	71	61	61	20	75	17	21	53	10	13	404
All grass	76	65	65	27	88	20	27	67	13	17	653
All crops and grass	83	72	73	26	108	37	47	89	27	34	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.2 Use of straight fertiliser, Scotland 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Winter wheat	99	23	29	177	91	76	175	21	22	117
Spring barley	60	8	11	77	64	71	46	5	8	256
Winter barley	99	15	21	158	71	60	157	11	12	57
Oats	73	2	16	93	-	-	68	-	-	44
Potatoes	32	3	32	173	-	162	55	-	52	19
Winter oilseed rape	100	18	35	185	81	71	185	15	25	38
Other crops	27	13	25	84	46	88	22	6	22	96
All tillage	71	12	19	127	76	78	91	9	15	627
Grass less than five years old	38	2	2	112	30	62	43	1	2	249
Grass five years and over	22	0	0	74	22	38	16	0	0	404
All grass	26	1	1	87	28	55	22	0	0	653
All crops and grass	42	5	7	111	72	76	47	3	5	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.3 Use of compound fertiliser, Scotland 2015

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Winter wheat	22	51	50	57	61	80	13	31	40	117
Spring barley	87	89	89	66	49	62	57	43	55	256
Winter barley	31	73	71	49	66	75	15	48	53	57
Oats	49	70	70	68	62	72	33	43	50	44
Potatoes	78	78	53	115	131	204	89	102	108	19
Winter oilseed rape	67	68	47	31	66	71	21	45	33	38
Other crops	39	41	43	75	55	71	29	22	31	96
All tillage	62	74	71	65	57	70	40	42	50	627
Grass less than five years old	73	76	78	95	29	39	69	22	31	249
Grass five years and over	61	61	61	61	17	21	37	10	13	404
All grass	64	64	65	70	20	26	44	13	17	653
All crops and grass	63	68	67	68	34	43	43	23	29	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.4 Use of lime, Scotland 2015

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Winter wheat	2.2	-	4.7	-	1.5	8.4	3.3	-	5.2	-	0.5	3.8	11	117
Spring barley	8.2	-	5.1	-	1.9	15.1	4.7	-	4.7	-	0.4	4.2	53	256
Winter barley	2.3	-	1.9	-	1.4	5.6	3.6	-	4.0	-	0.9	3.1	6	57
Oats	8.7	-	-	-	3.0	11.7	4.9	-	-	-	0.7	3.8	7	44
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	19
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	38
Other crops	7.7	-	3.0	-	9.6	20.3	3.6	-	3.3	-	0.4	2.1	18	96
All tillage	5.8	-	4.2	-	2.2	12.2	4.5	-	4.5	-	0.5	3.8	99	627
Grass less than five years old	0.8	-	2.5	-	2.7	6.0	4.2	-	4.7	-	0.5	2.7	19	249
Grass five years and over	0.7	-	1.3	-	1.2	3.2	3.2	-	3.9	-	0.5	2.5	25	404
All grass	0.7	-	1.6	-	1.6	3.9	3.5	-	4.2	-	0.5	2.6	44	653
All crops and grass	2.5	-	2.5	-	1.8	6.8	4.3	-	4.4	-	0.5	3.3	143	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	0	0	0	3	4	0	3	15	40	22	11	2	-	-	-	-	-	-	117
Spring barley	1	0	5	9	23	37	21	3	1	-	-	-	-	-	-	-	-	-	256
Winter barley	0	0	0	1	0	0	23	18	38	12	6	-	-	-	-	-	-	-	57
Oats	9	1	1	7	28	24	20	10	-	-	-	-	-	-	-	-	-	-	44
Potatoes	4	0	14	6	3	0	17	8	34	2	12	-	-	-	-	-	-	-	19
Winter oilseed rape	0	0	0	0	0	1	2	5	42	23	13	15	-	-	-	-	-	-	38
Other crops	39	9	12	6	5	16	3	4	7	-	-	-	-	-	-	-	-	-	96
All tillage	4	1	4	6	14	21	15	7	16	7	4	1	-	-	-	-	-	-	627
Grass less than five years old	10	1	10	12	11	21	6	7	9	3	4	5	0	1	-	-	-	-	249
Grass five years and over	29	4	18	25	10	6	2	3	1	1	0	1	-	-	-	-	-	-	404
All grass	24	3	16	22	10	9	3	4	3	2	1	2	-	-	-	-	-	-	653
All crops and grass	17	2	12	16	12	13	7	5	7	4	2	2	-	-	-	-	-	-	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	26	2	10	37	20	2	1	3	-	-	-	-	-	-	-	-	-	-	117
Spring barley	3	8	35	47	5	1	-	-	-	-	-	-	-	-	-	-	-	-	256
Winter barley	11	8	4	45	30	0	0	2	-	-	-	-	-	-	-	-	-	-	57
Oats	28	5	19	26	23	-	-	-	-	-	-	-	-	-	-	-	-	-	44
Potatoes	20	0	0	8	16	2	27	0	26	-	-	-	-	-	-	-	-	-	19
Winter oilseed rape	18	3	5	26	43	3	2	1	-	-	-	-	-	-	-	-	-	-	38
Other crops	46	13	11	16	9	1	1	2	-	-	-	-	-	-	-	-	-	-	96
All tillage	15	6	22	39	14	1	1	1	1	-	-	-	-	-	-	-	-	-	627
Grass less than five years old	22	39	28	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	249
Grass five years and over	39	49	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	404
All grass	35	46	15	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653
All crops and grass	28	32	17	16	5	-	-	-	-	-	-	-	-	-	-	-	-	-	1280

Source: British Survey of Fertiliser Practice 2015

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	23	4	8	12	34	15	3	0	0	0	1	-	-	-	-	-	-	-	117
Spring barley	2	6	21	33	27	12	-	-	-	-	-	-	-	-	-	-	-	-	256
Winter barley	13	8	10	9	50	7	4	-	-	-	-	-	-	-	-	-	-	-	57
Oats	14	3	5	44	28	6	1	-	-	-	-	-	-	-	-	-	-	-	44
Potatoes	20	0	0	8	0	0	8	17	0	13	14	11	3	0	0	5	-	-	19
Winter oilseed rape	20	3	10	18	33	17	-	-	-	-	-	-	-	-	-	-	-	-	38
Other crops	33	9	12	17	12	6	2	2	5	0	0	0	2	-	-	-	-	-	96
All tillage	12	6	14	24	28	11	1	1	0	0	1	-	-	-	-	-	-	-	627
Grass less than five years old	21	28	24	17	6	3	1	-	-	-	-	-	-	-	-	-	-	-	249
Grass five years and over	39	45	11	3	0	1	-	-	-	-	-	-	-	-	-	-	-	-	404
All grass	35	41	14	6	2	2	-	-	-	-	-	-	-	-	-	-	-	-	653
All crops and grass	27	29	14	13	11	5	1	-	-	-	-	-	-	-	-	-	-	-	1280

Source: British Survey of Fertiliser Practice 2015

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2015

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	70	59	59	16	69	15	17	48	9	10	347
Grazed mown	93	87	86	44	124	28	36	116	25	31	130
All grazings	74	64	63	20	80	18	21	59	11	13	477
Cut for silage - grazed	96	92	90	48	128	28	37	123	26	33	110
Cut for silage - not grazed	91	76	80	68	127	31	50	116	24	40	153
All cut for silage	93	83	85	59	128	30	44	119	25	37	263
Cut for hay - grazed	71	51	51	12	85	31	33	60	16	17	21
Cut for hay - not grazed	78	75	77	26	76	29	40	60	22	30	14
All cut for hay	74	61	62	18	81	30	37	60	18	23	35
All mowings	91	81	83	55	124	30	43	114	24	36	297
All grass	76	65	65	27	88	20	27	67	13	17	653

Source: British Survey of Fertiliser Practice 2015

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	30	5	21	27	8	5	1	2	0	0	0	1	-	-	-	-	-	-	347
Grazed mown	7	1	4	10	12	28	12	5	13	5	3	1	-	-	-	-	-	-	130
All grazings	26	4	18	24	9	9	2	3	2	1	1	1	-	-	-	-	-	-	477
Cut for silage - grazed	4	1	4	8	12	29	13	6	14	5	4	1	-	-	-	-	-	-	110
Cut for silage - not grazed	9	0	7	11	20	15	6	9	6	6	4	6	0	1	-	-	-	-	153
All cut for silage	7	1	6	10	16	21	9	7	9	6	4	3	0	1	-	-	-	-	263
Cut for hay - grazed	29	0	6	20	23	16	2	0	5	-	-	-	-	-	-	-	-	-	21
Cut for hay - not grazed	22	0	0	42	20	15	0	0	0	2	-	-	-	-	-	-	-	-	14
All cut for hay	26	0	3	29	21	16	1	0	3	1	-	-	-	-	-	-	-	-	35
All mowings	9	1	5	12	17	21	8	7	9	5	4	3	0	1	-	-	-	-	297
All grass	24	3	16	22	10	9	3	4	3	2	1	2	-	-	-	-	-	-	653

Source: British Survey of Fertiliser Practice 2015

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	41	52	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	347
Grazed mown	13	41	38	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	130
All grazings	36	50	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	477
Cut for silage - grazed	8	43	41	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	110
Cut for silage - not grazed	24	30	34	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	153
All cut for silage	17	36	37	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	263
Cut for hay - grazed	49	25	21	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Cut for hay - not grazed	25	29	33	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
All cut for hay	39	27	26	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
All mowings	19	35	36	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	297
All grass	35	46	15	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653

Source: British Survey of Fertiliser Practice 2015

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2015

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	41	49	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	347
Grazed mown	14	35	26	17	4	2	1	-	-	-	-	-	-	-	-	-	-	-	130
All grazings	37	47	11	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	477
Cut for silage - grazed	10	36	28	18	5	2	1	-	-	-	-	-	-	-	-	-	-	-	110
Cut for silage - not grazed	20	17	28	21	5	9	1	-	-	-	-	-	-	-	-	-	-	-	153
All cut for silage	15	26	28	20	5	6	1	-	-	-	-	-	-	-	-	-	-	-	263
Cut for hay - grazed	49	22	16	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Cut for hay - not grazed	23	29	28	3	13	4	-	-	-	-	-	-	-	-	-	-	-	-	14
All cut for hay	38	25	21	9	5	2	-	-	-	-	-	-	-	-	-	-	-	-	35
All mowings	17	26	27	19	5	5	1	-	-	-	-	-	-	-	-	-	-	-	297
All grass	35	41	14	6	2	2	-	-	-	-	-	-	-	-	-	-	-	-	653

Source: British Survey of Fertiliser Practice 2015

Table SC3.0 Product use by month of application, Scotland 2015

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	1	0	0	0	3	20	37	27	7	2	1
Straight P	4	16	0	0	0	8	15	39	5	4	9	0
Straight K	8	4	0	0	0	6	27	46	7	0	0	0
Compounds	4	1	0	0	0	1	10	53	18	7	3	2
All fertilisers	3	2	0	0	0	2	14	47	21	7	3	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	0	1	0	0	0	1	14	46	25	8	3	2
Phosphate	7	5	0	0	0	3	13	52	11	3	3	3
Potash	7	2	0	0	0	3	16	49	14	4	2	2
Total	3	2	0	0	0	2	14	48	20	6	3	2

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

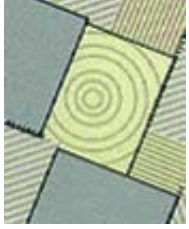
'Product' refers to the total tonnage of the products used by the farmers in the survey year 2015.

'Nutrient' refers to the tonnage of each nutrient contained in the products used.

(e.g. 100 kg of a 20:10:10 compound contains 20 kg of N, 10 kg of P_2O_5 and 10 kg of K_2O, while 100 kg of ammonium nitrate (straight N) contains typically 34.5 kg of N).

Estimates of total nutrients are shown in Section B, Table B2.6.

Source: British Survey of Fertiliser Practice 2015



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2015

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 1,343 farms in the survey, around 65% (923) 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, 2015

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*bio-solids*	*other non-farm*	*total with manure*
Farms in sample	420	702	247	34	16	42	38	66	11	35	27	923
Farms in population	31,857	45,955	15,012	1,354	991	2,258	1,498	5,307	787	1,417	1,063	59,773
Farms in population %	35%	50%	16%	1%	1%	2%	2%	6%	1%	2%	1%	65%
Volume (Mt; Mm^3)	n/a	33.1	38.6	1.7	1.4	0.9	0.7	2.1	1.1	2.0	1.9	83.5
Volume %	n/a	40%	46%	2%	2%	1%	1%	2%	1%	2%	2%	100%

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

Table D1.1b Percentage (%) of farms using each type of manure in Great Britain, 2011 - 2015

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
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
2015	35	50	16	1	1	2	2	6	3

Cattle manure from beef and dairy farms is by far the largest volume of manure type generated in Great Britain. The percentage of farms using cattle FYM has declined by 3% since 2011, whereas the use of cattle slurry is more consistent over the period and used on 16% of farms in 2015.

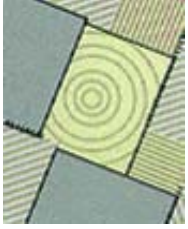


Table D1.1c Dressing cover of organic manure in Great Britain, 2011 - 2015

	all tillage	*grass 5 years and over*	*grass under 5 years old*
2011	22	32	47
2012	23	32	47
2013	23	35	47
2014	22	29	49
2015	23	29	53

Dressing covers of organic manure on grass under five years old have increased over the 5 year period. In 2015 23% 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 D1.2. 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 2015

			percentage of farms						
	farms in sample	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*	*non-broadcast*
Cattle slurry	247	15,012	81	10	9	2	0	0	20
Pig slurry	16	991	50	45	7	0	0	0	50
Grand Total	255	15,668	80	12	9	2	0	0	21

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.

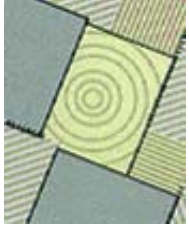


Table D1.3 gives estimates of the volume and area of manure/slurry incorporation on tillage fields by manure type and immediacy of incorporation. Farmyard manure is the most extensively incorporated at 95% of the volume with 83% of it incorporated within a week of spreading on tillage fields. Cattle and pig slurries are less likely to be incorporated with 14% and 55% 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 2015

	incorporation time after spreading										*total*	
	not incorporated		*within 6 hours*		*between 6 and 24 hours*		*between 1 and 7 days*		*more than 1 week*		*applied area*	*volume applied*
	%area	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*'000 ha*	*'Mt; Mm³*
FYM	5	6	13	13	30	28	41	42	10	10	759	17.9
Cattle slurry	19	14	19	27	16	16	28	23	18	19	146	5.1
Pig slurry	52	55	19	19	17	14	6	6	5	5	19	0.6
Poultry FYM	15	15	18	19	57	57	9	9	1	1	180	1.4
Other	14	14	16	10	32	35	32	32	6	10	155	3.6
Total	10	9	15	16	32	28	33	35	9	11	1,260	28.5

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 2015. Where contractors were used they were applying between 86% and 96% of the manure on average.

Table D1.4a Use of contractors to spread manure/slurry in current season, Great Britain 2015

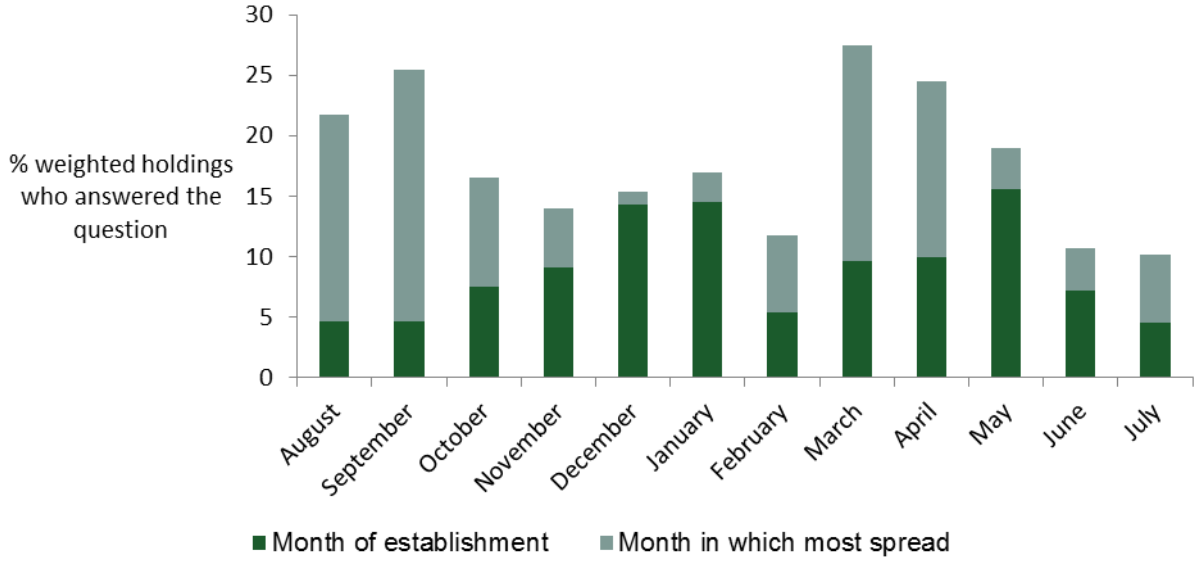
	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	36	32	86
Cattle slurry	30	29	91
Other	51	53	96
Total	34	33	89

Use of contractors to spread manures is fairly consistent over the 5 year period 2011-2015, on 28-36% of farms (Table 1.4b), as was the average amount spread, at 84-89%.

Table D1.4b Use of contractors to spread manure/slurry, Great Britain 2011 - 2015

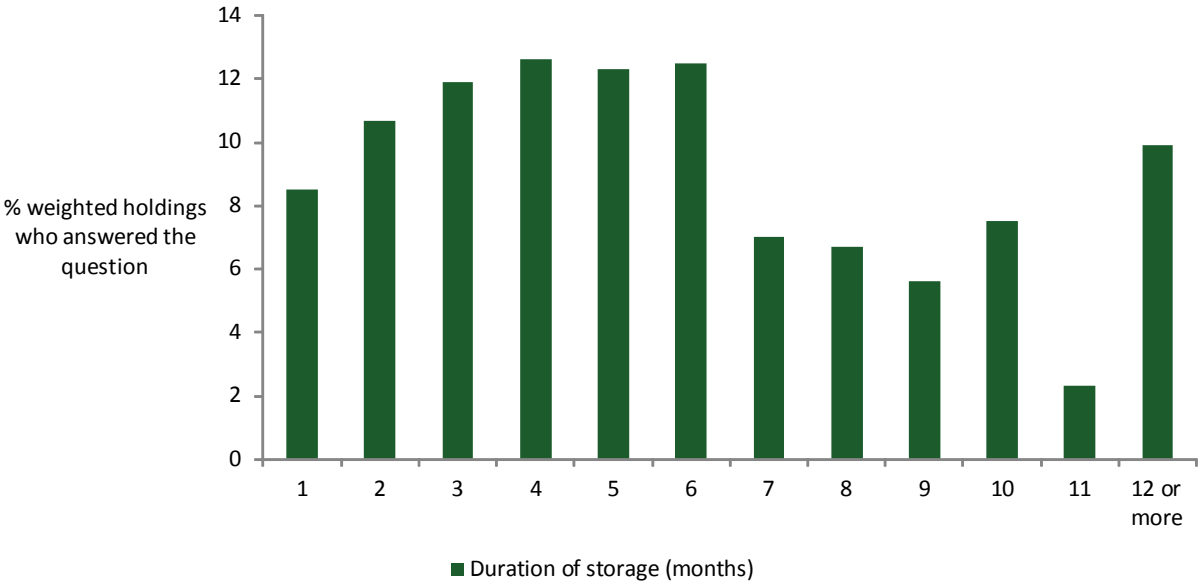
	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
2011	28	29	86
2012	32	32	84
2013	30	30	88
2014	36	39	87
2015	34	33	89

Figure D1.5a Temporary field heaps of manure, month of establishment and month when most spread, Great Britain 2015

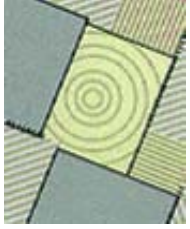


In 2015 farmers were asked, for the first time, when they established temporary heaps of solid manure in their fields and the month in which they subsequently spread most of the manure (Figure D1.5a). The peak months for establishment were December, January and May with between 14% and 15.5% of farms creating them at each of these timings. The peak months for spreading the manure were March at 17.9% of farms and September at 20.8% of farms. This pattern reflects the practice of applying a dressing of manure before establishing spring or winter sown tillage crops.

Figure D1.5b Temporary field heaps of manure, duration of storage in months, Great Britain 2015



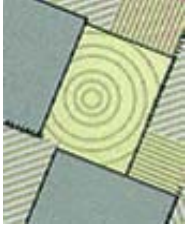
Farmers were also asked on average the duration in months that manure was stored in this way (Figure D1.5b). Storage for 3-6 months accounted for the practice on 49% of farms, with only 9.6% of farms storing for 12 months or more, when all types of manure are taken into account. The recommendation from the Food Standards Agency is that manure should be stacked for 8 weeks to reduce the risk of spreading resistant bacteria.



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 2011 - 2015

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*biosolids*	*other non-farm*
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
2015	14	8	1	0	1	1	1	0	1	1

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 2011 – 2015

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*biosolids*	*other non-farm*
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
2015	53	30	3	1	4	3	5	1	3	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 2015 was 14%, which is slightly lower than the five year average. Cattle FYM and cattle slurry were applied to 83% 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.

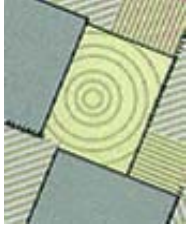


Table D2.2 Typical dry matter and nutrient content of different organic manure types[17]

	dry matter (%)	*total N (kg/t; kg/m^3)*	*total P_2O_5 (kg/t; kg/m^3)*	*total K_2O (kg/t; kg/m^3)*
Cattle FYM	25	6.0	3.2	8.0
Pig FYM	25	7.0	6.0	8.0
Sheep FYM	25	7.0	3.2	8.0
Duck manure	25	6.5	5.5	7.5
Layer hen manure	35	19.0	14.0	9.5
Broiler/turkey litter	60	30.0	25.0	18.0
Cattle slurry	6	2.6	1.2	3.2
Pig slurry	4	3.6	1.8	2.4
Digested liquid sewage sludge	4	2.0	3.0	0.1
Digested cake	25	11.0	18.0	0.6
Thermally dried	95	40.0	70.0	2.0
Lime stabilised	40	8.5	26.0	0.8
Composted	60	11.0	6.0	3.0
Compost-green	60	7.5	3.0	5.5
Compost-green/food	60	11.0	3.8	8.0

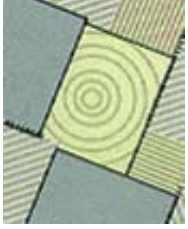
In Table D2.3, crops receiving manure applications have been classified as either “winter sown”, “spring sown” or “grass” and their average treated areas and manure application rates shown.

Table D2.3a Treated areas and average manure field application rates to winter sown and spring sown crops and grassland by manure type, Great Britain 2015

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*
Winter sown										
Treated area %	9.1	1.6	1.8	0.4	2.4	1.7	0.5	-	2.1	1.3
Treated area (ha)	294,294	52,358	56,939	12,396	77,518	54,943	16,860	-	66,802	41,576
Avg manure rate (t; m^3/ha)	24	36	21	31	8	7	13	-	21	26
Volume (Mt; Mm^3)	6.9	1.9	1.2	0.4	0.6	0.4	0.2	-	1.4	1.1
Fields in sample	347	54	27	12	38	33	29	0	40	25
Spring sown										
Treated area %	20.3	5.7	1.6	0.4	1.4	1.4	1.6	-	1.5	1.3
Treated area (ha)	328,396	92,943	26,322	6,333	22,724	23,135	25,349	-	24,355	20,459
Avg manure rate (t; m^3/ha)	25	34	18	28	7	9	19	-	19	29
Volume (Mt; Mm^3)	8.3	3.2	0.5	0.2	0.2	0.2	0.5	-	0.5	0.6
Fields in sample	479	118	31	5	22	29	20	3	15	18
Grass										
Treated area %	21.3	24.1	-	0.4	0.5	0.2	2.1	0.8	0.1	0.2
Treated area (ha)	1,185,049	1,340,692	-	20,747	28,016	11,979	116,703	41,802	6,733	13,192
Avg manure rate (t; m^3/ha)	15	25	-	40	5	10	12	26	19	15
Volume (Mt; Mm^3)	17.6	33.4	-	0.8	0.1	0.1	1.3	1.1	0.1	0.2
Fields in sample	682	491	1	17	14	6	58	18	5	8

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

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



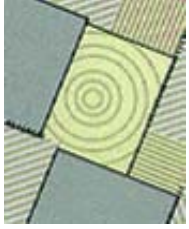
The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure within the farm on which it is produced. Conversely, non-farm manures such as biosolids appear to be favoured on winter sown tillage land. The profile of the % treated area and average manure rates are broadly similar to those reported for 2014.

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 2015

Cattle FYM	*Cereals*	*Dairy*	*General cropping*	*Mixed*	*Other livestock*	*All farm types*
Winter sown						
Treated area %	29.9	13.2	7.7	34.0	15.3	100.0
Treated area (ha)	87,980	38,719	22,613	99,967	45,015	294,294
Avg manure rate (t; m^3/ha)	22	25	22	26	22	24
Volume (Mt; Mm^3)	1.9	1.0	0.5	2.6	1.0	6.9
Fields in sample	75	66	23	118	65	347
Spring sown						
Treated area %	11.4	25.0	11.8	25.3	26.3	100.0
Treated area (ha)	37,371	82,006	38,635	83,004	86,294	328,396
Avg manure rate (t; m^3/ha)	24	25	28	27	22	25
Volume (Mt; Mm^3)	0.9	2.1	1.1	2.3	1.9	8.3
Fields in sample	40	131	43	121	143	479
Grass						
Treated area %	0.3	15.3	0.9	5.6	77.9	100.0
Treated area (ha)	3,441	181,579	10,700	66,602	922,727	1,185,049
Avg manure rate (t; m^3/ha)	20	16	16	18	14	15
Volume (Mt; Mm^3)	0.1	2.9	0.2	1.2	13.2	17.6
Fields in sample	5	93	15	43	526	682

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.

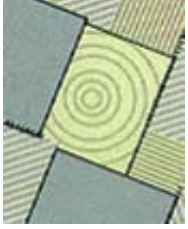
Table 2.3b shows a breakdown of the cattle FYM applications by robust farm type. Mixed farms have the most extensive treatments of cattle FYM on winter sown crops at 34.0% of the treated area. On grass 77.9% of the treated area (with cattle FYM) is on Other Livestock robust classification farms.



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. In 2015 the percentage of pig slurry applied as a top-dressing to winter-sown crops in the spring was 24% a decrease from 2014 where the percentage was 49%, 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 2015

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*
Winter sown										
August	5	1	40	0	5	20	3	0	18	16
September	9	1	18	6	19	22	7	0	37	11
October	2	0	5	0	7	1	0	0	9	5
Winter (Nov, Dec, Jan)	0	0	0	0	0	0	0	0	0	0
Spring (Feb, Mar, Apr)	0	1	0	24	12	10	1	0	5	18
Summer (May, Jun, Jul)	1	0	4	1	0	8	0	0	0	4
Spring sown										
August	0	0	2	0	2	3	0	1	1	0
September	1	0	2	0	3	2	1	1	0	0
October	0	0	0	0	0	0	0	0	3	2
Winter (Nov, Dec, Jan)	2	1	4	1	0	0	1	0	7	0
Spring (Feb, Mar, Apr)	15	5	22	15	17	16	12	2	13	24
Summer (May, Jun, Jul)	1	1	1	0	5	5	2	1	0	3
Grass										
August	5	5	0	0	0	0	15	3	2	2
September	6	4	0	0	3	0	4	3	0	4
October	5	3	0	2	0	0	3	6	0	0
Winter (Nov, Dec, Jan)	9	9	0	0	0	0	4	8	0	0
Spring (Feb, Mar, Apr)	29	45	2	37	17	13	24	44	0	11
Summer (May, Jun, Jul)	10	25	0	14	12	0	24	33	4	2
% of total treated area	46	36	2	1	2	2	4	1	3	2



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[18]. 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.

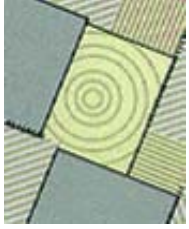
Table D3.1a Dressing cover (%) and application rates (kg/ha) of manufactured fertiliser to tillage crops in Great Britain, with and without applications of organic manure, 2015

	nitrogen		*phosphate*		*potash*		*fields in sample*	
dressing cover (%)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	99	100	32	48	41	48	331	1,078
Spring barley	99	100	67	69	71	71	213	477
Winter barley	100	99	35	59	45	65	110	361
Potatoes (maincrop)	96	95	76	77	81	82	36	46
Sugar beet	98	99	30	51	60	70	48	52
Winter oilseed rape	100	100	26	52	31	46	90	413

	nitrogen		*phosphate*		*potash*		*fields in sample*	
average field rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	180	196	57	65	77	72	331	1,078
Spring barley	96	111	45	49	59	64	213	477
Winter barley	147	149	51	56	59	70	110	361
Potatoes (maincrop)	131	186	149	143	202	246	36	46
Sugar beet	94	106	59	60	109	88	48	52
Winter oilseed rape	174	197	56	64	78	69	90	413

	nitrogen		*phosphate*		*potash*		*fields in sample*	
overall application rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	179	196	18	32	31	35	331	1,078
Spring barley	95	111	30	34	42	45	213	477
Winter barley	147	148	18	33	27	45	110	361
Potatoes (maincrop)	126	178	114	111	163	202	36	46
Sugar beet	92	105	18	30	66	61	48	52
Winter oilseed rape	174	197	14	33	24	32	90	413

[14] Anon. (2010). *Fertiliser Manual (RB209),* Defra, 8th edition. The Stationery Office, London. ISBN 978-0-11-243286-9. For the latest release see the AHDB 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 1 kg/ha for winter barley to 52 kg/ha on potatoes, although the fact that the data derive from low number of 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 58% decrease in the application rate of phosphate on manured winter oilseed rape fields. This decrease was mainly caused by a reduction in dressing cover with only 26% of manured winter oilseed rape fields receiving a dressing of phosphate fertiliser. The survey does not collect reasons why manufactured fertiliser application rates may vary when used with or without organic manures. It is possible that certain fields are being managed to achieve a desired nutrient status and a strategy of this sort may require unusually high or low applications of specific nutrients. Where only a small number of fields are surveyed, such a strategy may exert an influential bias on the overall figures for a crop.

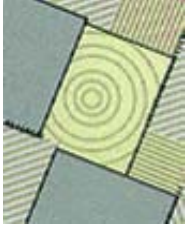
Table D3.1b Overall application rates (kg/ha) of manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2011 - 2015

	2011		*2012*		*2013*		*2014*		*2015*	
nitrogen (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	179	198	170	190	175	187	167	192	179	196
Spring barley	97	107	95	105	96	113	100	113	95	111
Winter barley	137	144	140	145	141	145	137	147	147	148
Potatoes (maincrop)	146	178	133	136	183	167	137	149	126	178
Sugar beet	81	99	89	99	87	103	89	101	92	105
Winter oilseed rape	174	203	166	191	161	187	175	195	174	197

	2011		*2012*		*2013*		*2014*		*2015*	
phosphate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	15	32	13	29	16	29	16	29	18	32
Spring barley	37	35	32	36	28	32	36	37	30	34
Winter barley	24	32	18	33	26	28	22	34	18	33
Potatoes (maincrop)	122	119	108	104	119	126	82	100	114	111
Sugar beet	10	36	13	31	15	34	7	33	18	30
Winter oilseed rape	10	30	8	28	21	28	11	29	14	33

	2011		*2012*		*2013*		*2014*		*2015*	
potash (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	30	34	21	33	22	34	27	36	31	35
Spring barley	47	47	42	51	40	48	46	48	42	45
Winter barley	34	49	27	44	36	43	31	48	27	45
Potatoes (maincrop)	199	213	183	208	203	249	152	191	163	202
Sugar beet	50	93	65	73	72	76	62	75	66	61
Winter oilseed rape	15	29	11	30	15	30	20	28	24	32

Differences in overall application rates with and without manures for nitrogen, phosphate and potash for the period 2011 to 2015 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 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 2015

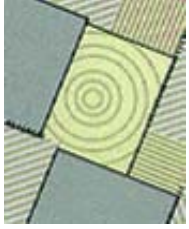
	nitrogen (kg/ha)		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Cereals								
Grass under 5 years old *	108	126	35	40	101	67	8	83
Grass 5 years and over *	101	69	63	23	63	37	9	245
All grass	104	87	42	29	94	48	17	328
Dairy								
Grass under 5 years old	165	141	28	27	55	50	158	52
Grass 5 years and over	141	120	23	20	37	28	201	141
All grass	150	122	25	20	44	30	359	193
General cropping								
Grass under 5 years old *	114	94	20	24	33	41	8	51
Grass 5 years and over *	91	71	30	22	34	30	13	114
All grass	98	77	28	23	33	33	21	165
Mixed								
Grass under 5 years old *	121	115	26	29	40	47	47	150
Grass 5 years and over *	69	83	21	20	32	28	26	292
All grass	109	91	25	22	38	33	73	442
Other livestock								
Grass under 5 years old	108	85	26	28	34	34	177	154
Grass 5 years and over	78	60	21	18	26	19	499	673
All grass	84	64	22	20	28	21	676	827
All farm types								
Grass under 5 years old	137	105	27	29	45	44	400	492
Grass 5 years and over	101	74	22	19	30	23	755	1476
All grass	112	79	23	21	35	27	1155	1968

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 47 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 2015

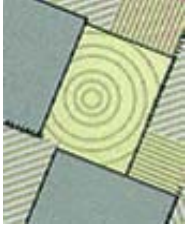
	nitrogen (kg/ha)		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
All cut for hay	117	107	34	23	32	24	17	13
All cut for silage	157	141	26	29	50	50	246	67
All grazings	143	122	25	20	41	30	280	186

Application rates of mineral fertilisers are consistently higher for grass to be cut for silage. Average field rates tend to be higher on those fields receiving a dressing of manure.

Table D3.3b Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2011 – 2015

all cut for hay	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2015	117	107	34	23	32	24	17	13
all cut for silage	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2015	157	141	26	29	50	50	246	67
all grazings	*nitrogen (kg/ha)*		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
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
2015	143	122	25	20	41	30	280	186

Mineral fertiliser application rates of nitrogen are variable over the 5 year period 2011-15 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 26-28 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, SOIL TESTING

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 2015, 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 four 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 2011 – 2015

	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*
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
2015	12	9	4	12	37	24	13	1

Practices of checking are generally consistent over the five year period 2011-2015, 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 2014/15 crop year, Great Britain 2015

	manufactured fertilisers				*organic manures*			
	farms	*farms %*	*area (ha)*	*area %*	*farms*	*farms %*	*area (ha)*	*area %*
Computer program	17,178	23.2	3,449,516	37.4	8,859	17.0	1,913,612	29.0
Farm diary	40,368	54.6	4,389,481	47.6	28,305	54.3	3,230,234	48.9
Farm notebook/pocketbook	14,583	19.7	1,586,044	17.2	10,884	20.9	1,186,847	18.0
File record sheet (file in the office)	14,345	19.4	1,841,261	20.0	9,595	18.4	1,269,665	19.2
Other paper record	2,548	3.4	340,141	3.7	1,839	3.5	259,604	3.9
No records kept	2,946	3.8	285,524	3.0	7,565	12.7	700,720	9.6

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 23% of farms, but this equates to 37% in area terms. No records were kept on 4% 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 43%, and lowest, at less than 16% on dairy and other livestock farms, where a higher proportion use farm diaries. Farms of all types, except cereals, 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.

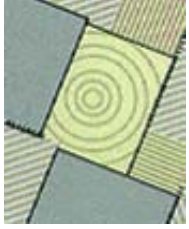


Table E1.2b Record keeping methods for fertiliser and manure applications on farms where each nutrient type was applied during the 2014/15 crop year, by farm type, Great Britain 2015

	manufactured fertilisers		*organic manures*	
Cereals	*farms*	*farms %*	*farms*	*farms %*
Computer program	7,405	42.6	2,627	40.7
Farm diary	7,379	42.5	2,154	33.3
Farm notebook/pocketbook	3,460	19.9	1,617	25.0
File record sheet (file in the office)	3,833	22.1	1,250	19.3
Other paper record	627	3.6	182	2.8
No records kept	0	0.0	693	9.7
	manufactured fertilisers		*organic manures*	
Dairy	*farms*	*farms %*	*farms*	*farms %*
Computer program	1,347	16.2	1,142	13.8
Farm diary	4,988	60.1	4,957	60.0
Farm notebook/pocketbook	1,418	17.1	1,229	14.9
File record sheet (file in the office)	1,569	18.9	1,624	19.7
Other paper record	293	3.5	293	3.5
No records kept	432	4.9	1,005	10.8
	manufactured fertilisers		*organic manures*	
General cropping	*farms*	*farms %*	*farms*	*farms %*
Computer program	3,807	39.5	1,561	34.6
Farm diary	4,625	48.0	2,449	54.3
Farm notebook/pocketbook	1,552	16.1	979	21.7
File record sheet (file in the office)	3,204	33.3	1,406	31.2
Other paper record	24	0.3	24	0.5
No records kept	24	0.3	194	4.1
	manufactured fertilisers		*organic manures*	
Mixed	*farms*	*farms %*	*farms*	*farms %*
Computer program	3,065	28.2	2,333	28.0
Farm diary	4,881	45.0	3,832	45.9
Farm notebook/pocketbook	2,932	27.0	1,907	22.9
File record sheet (file in the office)	2,035	18.7	1,493	17.9
Other paper record	348	3.2	293	3.5
No records kept	0	0.0	56	0.7
	manufactured fertilisers		*organic manures*	
Other livestock	*farms*	*farms %*	*farms*	*farms %*
Computer program	1,127	4.2	871	3.7
Farm diary	17,913	66.7	14,330	60.5
Farm notebook/pocketbook	5,198	19.4	5,073	21.4
File record sheet (file in the office)	3,547	13.2	3,767	15.9
Other paper record	1,257	4.7	1,046	4.4
No records kept	2,489	8.5	5,514	18.9
	manufactured fertilisers		*organic manures*	
All farm types	*farms*	*farms %*	*farms*	*farms %*
Computer program	17,178	23.2	8,859	17.0
Farm diary	40,368	54.6	28,305	54.3
Farm notebook/pocketbook	14,583	19.7	10,884	20.9
File record sheet (file in the office)	14,345	19.4	9,595	18.4
Other paper record	2,548	3.4	1,839	3.5
No records kept	2,946	3.8	7,565	12.7

Note: more than one method may be used

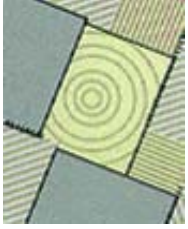


Table E1.2c Record keeping methods percentage (%) of farms, for fertiliser and manure applications on farms where each respective nutrient type was applied in the crop year, Great Britain 2011-2015

		computer program	*farm diary*	*farm notebook/pocket-book*	*file record sheet (file in the office)*	*other paper record*	*no records kept*
manufactured fertilisers	*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
	2015	23.2	54.6	19.7	19.4	3.4	3.8
organic manures	*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
	2015	17.0	54.3	20.9	18.4	3.5	12.7

Note: more than one method may be used

Recording methods for manufactured fertilisers show minor variations across the five year period 2011-15 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 Soil testing percentage (%) of tillage and grass area, Great Britain 2015

	tillage area %	*grass area %*
Standard P, K, Mg, pH	24.7	5.2
Nitrogen	10.1	1.8
pH (lime only)	10.0	2.9
Precison farming purposes	6.5	0.4

Table E1.3 shows the percentage of the tillage and grass area that was soil tested in the 2015 cropping year. It is usual practice, especially on tillage fields to test a sub set of them in any given year. Standard P, K, Mg, pH was the most commonly used soil test in 2015, at 25% of the tillage area and 5% of the grass area. All types of soil tests were more prevalent on tillage than on grass.

Soil testing questions were asked in the 2014 survey, but the results are not shown here. The decision has been taken that the data needs to be collected over a number of years, before publishing a time series.

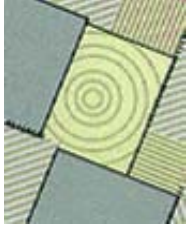


Figure E1.4a Security guidance unpromoted awareness, Great Britain 2013 and 2015

In 2013 and again in 2015 farmers were asked about the guidance they were aware of on storing fertilisers to minimise the risk of theft (Figure E1.4a). When asked without prompting awareness had improved for all sources over the period.

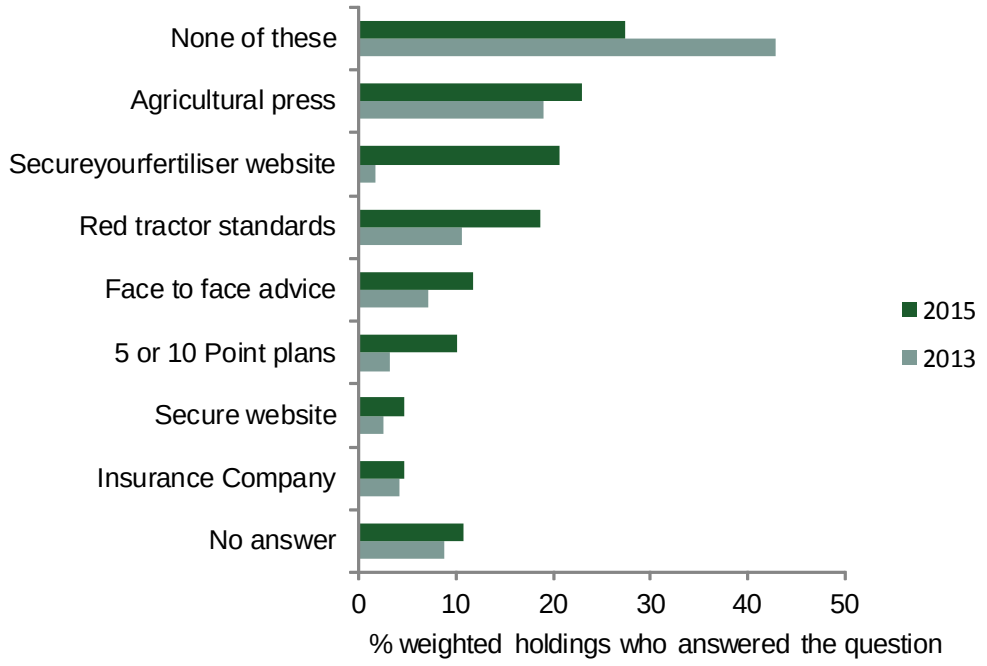
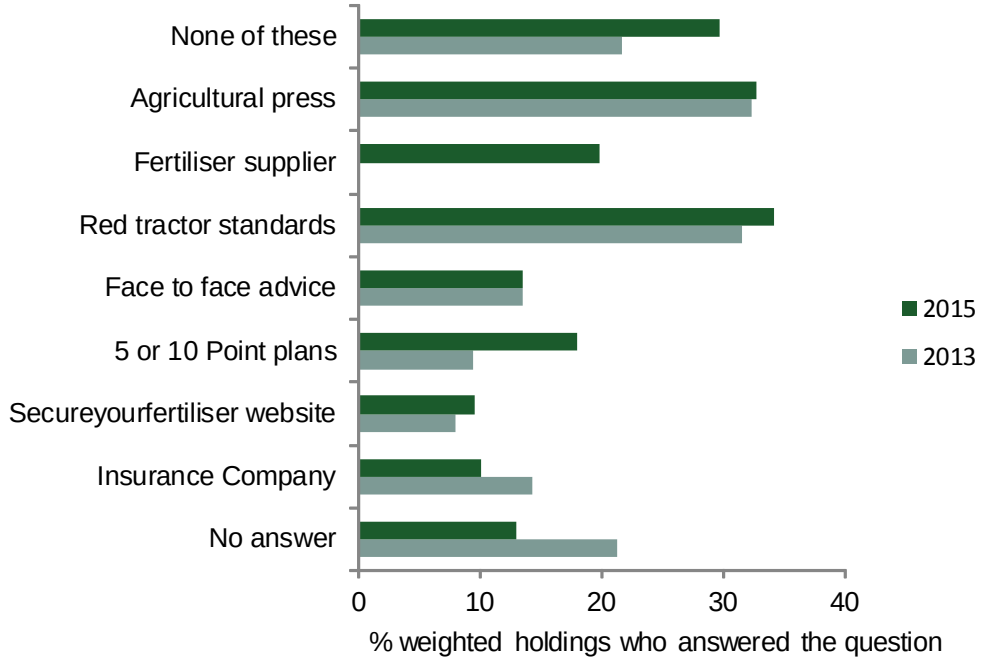
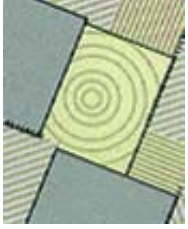


Figure E1.4b Security guidance promoted awareness, Great Britain 2013 and 2015



With prompting the responses were closer for the two years, but it is a reflection of greater awareness without prompting. Fertiliser suppliers were not included as a guidance source in 2013.



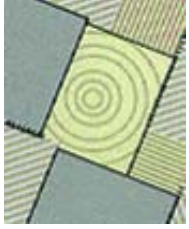
APPENDIX 1 - SURVEY STATISTICS

APP 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2015

Great Britain	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	2.2	2.5	1.1	1.4	1.6	1.3	2.0	2.1	5.2	1.6	1.7	1.5	1429
oilseed rape	2.6	2.6	0.9	1.8	2.1	2.5	2.6	2.5	2.9	2.0	2.5	2.3	506
winter barley	2.3	2.7	1.4	1.8	2.4	1.8	2.1	2.2	5.1	1.9	2.5	2.1	474
spring barley	1.8	2.4	1.7	1.3	1.6	1.2	1.7	2.0	2.0	1.3	1.6	1.8	708
m/c potatoes	8.8	9.3	10.0	9.7	14.6	10.7	7.3	11.9	9.6	8.5	12.2	37.3	84
sugar beet	4.0	4.0	2.3	4.7	6.0	7.2	3.6	3.1	7.8	8.0	6.5	13.3	100
all tillage crops	2.0	2.3	1.0	0.9	1.2	1.0	1.9	1.9	1.8	1.2	1.5	1.7	4547
all grass	1.8	1.5	1.1	0.4	0.6	0.3	1.9	2.4	1.7	0.8	1.2	1.9	3332
England & Wales	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	2.4	2.6	1.1	1.4	1.6	1.4	2.1	2.3	5.6	1.7	1.8	1.5	1312
oilseed rape	2.7	2.8	1.0	1.8	2.1	2.6	2.7	2.6	3.6	2.2	2.7	2.4	468
winter barley	2.4	2.9	1.5	1.8	2.5	1.8	2.3	2.3	5.9	2.1	2.9	2.1	417
spring barley	2.3	2.8	1.8	1.4	1.9	1.5	2.1	2.2	2.7	1.7	2.2	2.1	452
m/c potatoes	9.6	9.8	10.8	10.6	15.7	6.7	8.2	11.9	10.7	9.6	13.6	20.5	74
sugar beet	4.0	4.0	2.3	4.8	6.0	6.5	3.7	3.1	7.8	8.2	6.6	12.0	99
all tillage crops	2.2	2.5	1.0	1.0	1.3	1.0	2.1	2.0	2.4	1.5	1.9	1.4	3920
all grass	2.0	1.7	1.1	0.4	0.7	0.4	2.2	2.7	2.1	1.0	1.6	2.1	2679
Scotland	standard errors for overall application rates (kg/ha)						standard error for average field rates (kg/ha)						fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total SO_3*	
winter wheat	5.0	7.1	5.3	4.8	5.5	5.7	5.0	5.9	13.2	4.1	4.8	6.4	117
oilseed rape	5.6	4.7	3.3	6.7	7.1	10.1	5.6	4.7	2.8	4.9	5.8	8.0	38
winter barley	6.1	7.7	4.4	5.1	5.7	6.4	6.1	7.1	9.2	4.6	4.8	7.2	57
spring barley	3.0	3.7	3.1	1.9	2.4	2.1	2.7	3.3	2.9	1.7	2.2	3.7	256
all potatoes	19.1	20.1	19.4	16.7	28.2	37.7	15.5	34.3	18.2	12.5	23.1	110.1	19
all tillage crops	3.8	4.8	2.9	2.0	2.4	2.7	3.7	5.0	2.8	1.9	2.3	8.0	627
all grass	3.8	3.1	2.9	0.8	1.2	0.8	3.6	5.3	3.1	1.0	1.7	4.0	653

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.

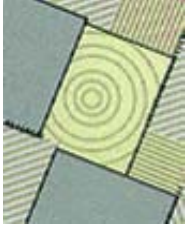
Table App 1.2 Response to main and reserve samples in 2015

	2015	*% total*
Target sample	1500	100
2014 panellists agreeing to re-contact in 2015	1284	86
Achieved 'Main' sample from 2014 panel	923	62
Achieved additional 'Main' sample	166	11
Achieved '1st reserve' sample	137	9
Achieved '2nd reserve' sample	74	5
Achieved '3rd reserve' sample	43	3
Total achieved	**1343**	**90**
Total number of refusals/non-contact	1211	
Total number of farms approached	***2554***	

Table App 1.3 Response to main and reserve samples for 2011 - 2015

Net response rate	*2011 %*	*2012 %*	*2013 %*	*2014 %*	*2015 %*
Overall achieved rate	95	94	91	91	90
Achieved % of total contact attempts	59	53	51	52	53
Main sample	81	82	78	76	81
Reserve sample(s)	19	18	12	14	19
Main reason for refusal	*2011 %*	*2012 %*	*2013 %*	*2014 %*	*2015 %*
Too busy	20	22	25	22	17
Not interested	13	13	16	17	14
Do not do surveys	4	4	5	5	4
Want payment	0	0	1	0	0
Too much paperwork	1	0	1	1	1
Non contact	40	41	32	41	45
Other [a]	22	20	20	13	20

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

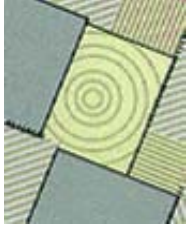


APP 1.3 INFORMATION ON HOLDINGS BELOW 20 HECTARES

Holdings of less than 20 hectares in size are excluded from the BSFP sample. These smaller farms account for a significant proportion of the number of holdings but a much smaller proportion of the area of crops and grass. At Great Britain level, the total number of holdings in the population for 2014 was 190,422. 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.

2014	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	6,081,277	89,063	243,212	39,100	4%	44%	101,359	190,422
of which crops	4,831,583	65,604	183,005	27,595	4%	42%	124,818	190,422
of which temporary grass< 5 years old	1,249,694	56,507	259,387	37,809	21%	67%	133,915	190,422
Total grass	6,432,148	160,700	615,355	86,069	10%	54%	29,722	190,422
grass < 5 years old	1,249,694	56,507	259,387	37,809	21%	67%	133,915	190,422
grass ≥ 5 years old	5,182,454	152,827	619,437	87,873	12%	57%	37,595	190,422

Note: Includes bare fallow and uncropped land.

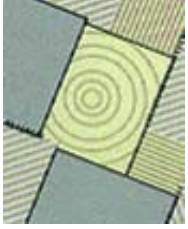


APPENDIX 2

APP 2.1 ENGLISH COUNTIES WITHIN BSFP AND DEFRA REGIONS

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

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



APPENDIX 3

APP 3.1 UK FARM CLASSIFICATION SYSTEM

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

Robust types	Main types	Constituent EC types [1]
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 [2]	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 [3]	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]

[1] 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.

[2] 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.

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