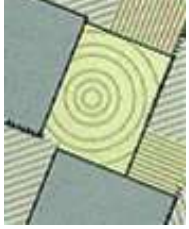
THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2020



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National Statistics Status

National Statistics status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

The continued designation of these statistics as National Statistics was confirmed in 2012 following a full assessment by the UK Statistics Authority against the Code of Practice for Statistics.

Since the last review of these statistics in 2012, we have continued to comply with the Code of Practice for Statistics, and have made improvements including:

- •Incremental improvements to the sample selection to optimise coverage for key survey data items
- •Improvements to the wording of questions in light of feedback from interviewers
- •Flexible use of the survey platform to collect additional data to meet needs of data users (the modular questions)

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

Limited extracts from this publication may be reproduced provided that the source is acknowledged. Further statistical analyses of the survey results are also available. For details and other enquiries please contact:

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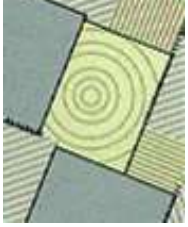
https://www.gov.uk/government/collections/fertiliser-usage



FOREWORD

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

The 2020 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 2020, the Survey was co-ordinated by 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 and the environment. 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.

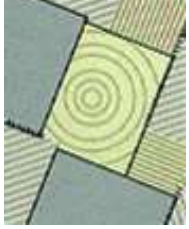
Contact information and feedback

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 2020.

August 2021



ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2020 British Survey of Fertiliser Practice.

This Survey this year was particularly challenging given that it was conducted in accordance with Government restrictions due to the Global Covid-19 pandemic.

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).

Warrick Steptoe[1]

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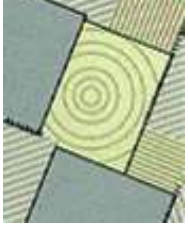

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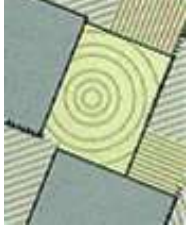

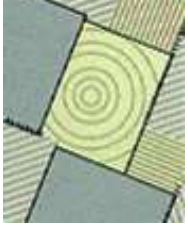

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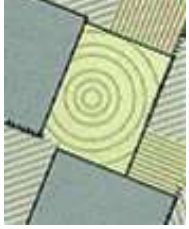
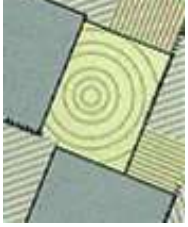
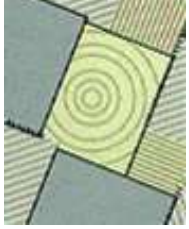






EXECUTIVE SUMMARY

The British Survey of Fertiliser Practice (BSFP) 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.

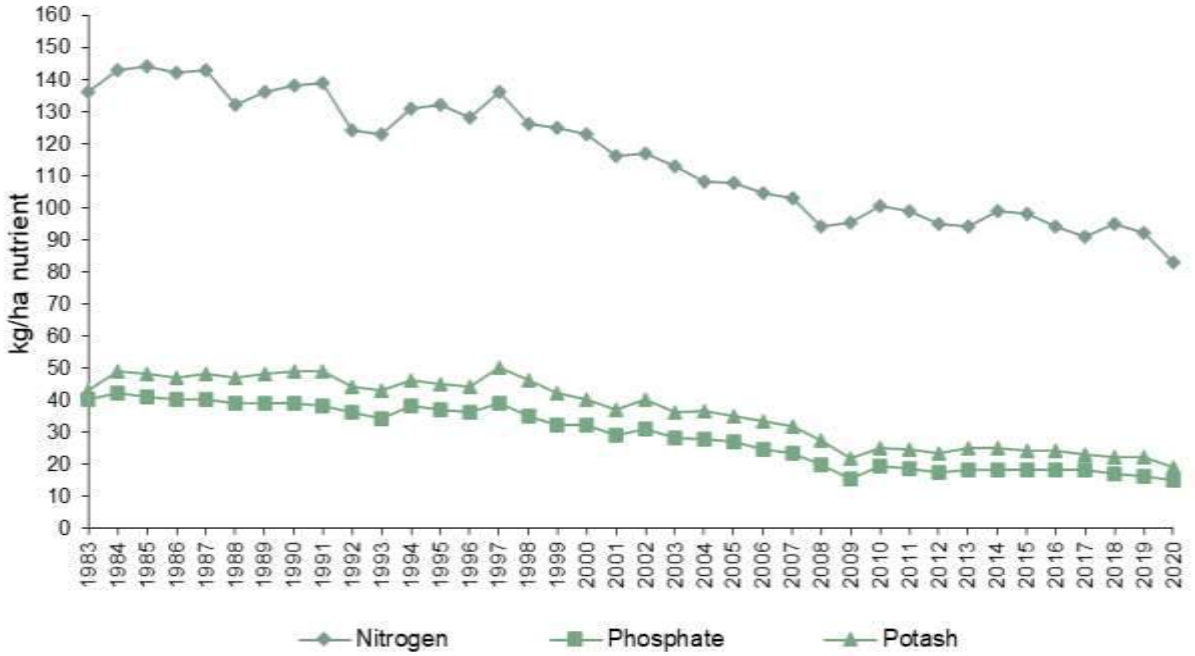
The main findings from the 2020 Survey on the use of the nutrients nitrogen, phosphate, potash, and sulphur in Great Britain are summarised below (Table ES1).

Cropping patterns can influence fertiliser rates and dressing covers observed. In 2020 there was a 5.1% decrease in the total area of tillage crops planted. In addition, there was a 26% reduction in the area planted to winter wheat, winter barley and winter oilseed rape, a consequence of the fifth wettest winter on record since 1862. Conversely, the cropped areas of spring barley and peas/beans increased by 52% and 31%, respectively. 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 2020.

	All Tillage	All Grass	All Crops and Grass
Total Nitrogen - N			
Overall application rate, 2020 (kg/ha)	121	53	83
Mean overall application rate, 2016-2020 (kg/ha)	136	55	91
Crop area receiving dressing, 2020 (%)	89	56	70
Average field rate, 2020 (kg/ha)	136	96	118
Total Phosphate - P_2O_5			
Overall application rate, 2020 (kg/ha)	24	8	15
Mean overall application rate, 2016-2020 (kg/ha)	27	8	17
Crop area receiving dressing, 2020 (%)	46	35	40
Average field rate, 2020 (kg/ha)	52	22	37
Total Potash - K_2O			
Overall application rate, 2020 (kg/ha)	29	11	19
Mean overall application rate, 2016-2020 (kg/ha)	35	12	22
Crop area receiving dressing, 2020 (%)	44	37	40
Average field rate, 2020 (kg/ha)	66	31	48
Total Sulphur - SO_3			
Overall application rate, 2020 (kg/ha)	31	5	16
Mean overall application rate, 2016-2020 (kg/ha)	33	4	17
Crop area receiving dressing, 2020 (%)	59	15	34
Average field rate, 2020 (kg/ha)	53	33	48

Figure ES1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2020

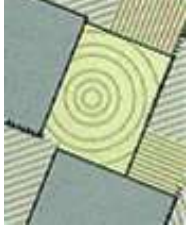


Nitrogen

- Nitrogen usually has a large immediate effect on crop growth, yield and quality. Most agricultural soils in Great Britain contain too little naturally occurring plant-available nitrogen to meet the needs of a crop so supplementary nitrogen applications must be made each year.
- The 9 kg/ha decrease in total nitrogen use on all crops and grassland in 2020 resulted from a 16 kg/ha decrease in the overall rate on tillage crops to 121 kg/ha and a 1 kg/ha decrease on grass to 53 kg/ha. These changes especially for tillage crops, reflect exceptional changes in the balance of winter and spring cropping for the 2019-20 season.
- Mineral fertiliser nitrogen levels applied to grassland have been consistently lower than on tillage crops. Whereas overall nitrogen rates on tillage have remained relatively 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. Please refer to table B2.1
- Except for spring barley, the overall application rates of nitrogen decreased for all other major tillage crops in 2020. The overall nitrogen rate on winter wheat and winter barley decreased by 8 kg/ha (to 177 kg/ha) and 4 kg/ha (to 139 kg/ha), respectively. The overall rate for oilseed rape decreased by 12 kg/ha (to 168 kg/ha), and for sugar beet by 5 kg/ha (to 69 kg/ha). For spring barley, the overall rate of nitrogen increased by 4 kg/ha to 99 kg/ha, almost reversing the changes between 2018 and 2019.

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.
- 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 (51% for grass <5 years old,



32% for grass of 5 years or more) than on tillage crops (25% cover) and grazed grassland also receives manure as it is grazed.

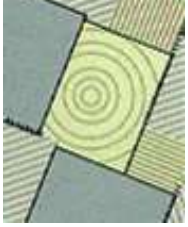
- Overall phosphate usage on tillage crops declined gradually between 1984 and 1996. Thereafter the decline in rates became more marked until 2009, after which there was some recovery and relative stability until 2018, when a 3 kg/ha decrease to 27 kg/ha was recorded. In 2020 there was a 2 kg/ha decrease to 24 kg/ha. 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 8 kg/ha in 2020.
- 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 2014 and 2018 overall potash application rates were reasonably stable in the range 35-40 kg/ha, but declined again in 2020 by 5 kg/ha to 29 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 2008. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, tended to decline, although have now achieved some stability in the range of 11-12 kg/ha since 2015.
- 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 & Wales, and although there has been a reduction in dressing covers and overall rates since 2004, they were relatively stable again on tillage by 2010. 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

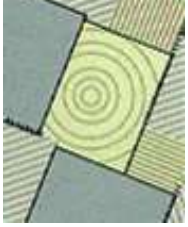
- Sulphur is an essential plant nutrient and is a component of most proteins as well as activating certain enzyme systems. In the past sulphur demand was satisfied through atmospheric deposition but this contribution is now hardly significant. Therefore, there is a need for sulphur application to crops 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 common scab (*Streptomyces scabiei)* 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 static until 2002, and then increased steadily to 2007. Dressing covers reduced in 2008 and 2009 for all cereals except winter barley. In 2020, sulphur dressing covers in cereals were in the 54%-76% range.
- The 83% dressing cover for winter oilseed rape was 1% higher than observed in 2019, and 13% higher than observed in 2016.
- In 2020, 34% of all crops and grass received a dressing of sulphur; this figure was 58% for tillage crops. On tillage crops the overall application rate for sulphur was 31 kg/ha, 2 kg/ha below the five-year average between 2016-2020 of 33 kg/ha. Applications on grass were unchanged in 2020 at 5 kg/ha as was dressing cover, with 14% 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 recycled source of nitrogen, phosphorus, potassium and sulphur. Where used, applications of manufactured fertiliser can usually be reduced.



- In 2020, around 70% of farms 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. In 2020, 60% of cattle manure and 91% of all 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 dressed predominantly in spring and summer.



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 and environmental 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 use which are given in Table B2.7. 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.[2, 3, 4, 5] Since 1992 the Survey has reported amalgamated data for Great Britain, in addition to the results for England & Wales and for Scotland. Weighted results for the major combinable crops and grassland were also recalculated from the national surveys to provide additional data for these crops for Great Britain from 1983.

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 Kynetec (formerly GfK Kynetec), who also retained responsibility for conducting the fieldwork. Under government rules, the contract for the Survey was retendered in 2018 and Kynetec were awarded the contract again.

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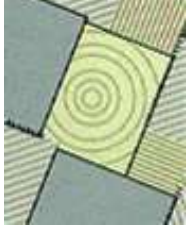
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

[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 less than 5% of the total crop area and around 9% 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.

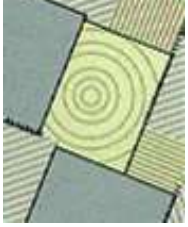
In 2020, the target sample size is 1,500 farms. This sample size has been designed in order to achieve a statistically representative sample at the national level. The farms are allocated to each of the combinations of farm type and size in proportion to the total area of crops and grass recorded in the June Survey (the latest available data). The exception to this is that in England & Wales where 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 1,336 holdings in 2020. This is a 0.7% increase on the sample size from last year. It should be noted that, due to Government restrictions following the global Covid-19 pandemic, the vast majority of all interviews were conducted via phone, with the remaining face to face interviews being conducted in line with Government protocols at the time of fieldwork. 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 completes 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 2020, 77% of the panel had responded in the previous year. The profile of the Survey panel in terms of farm size was 77% >200ha, 80% 100-200ha, 74% 50-100ha and 73% >20-50ha.

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 is 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 2020 Survey, England & Wales

	farm holdings in population in 2020	total crops and grass in 2020 (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	16,454	6.2	0.47	77	92	0.56
51-100 ha	13,965	11.3	1.00	140	132	0.95
101-200 ha	9,718	15.2	1.93	187	172	1.77
200+ ha	4,812	20.1	5.16	248	241	5.01
Total livestock & mixed	44,949	52.8	1.45	652	637	1.42
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	7,213	2.7	0.47	34	41	0.57
51-100 ha	6,737	5.4	0.99	67	61	0.91
101-200 ha	6,006	9.6	1.98	119	117	1.95
200+ ha	5,991	27.8	5.73	344	235	3.92
Total crops	25,947	45.6	2.17	563	454	1.75
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	780	0.3	0.83	7	10	1.28
51-100 ha	430	0.3	1.80	8	6	1.40
101-200 ha	249	0.4	3.60	9	6	2.41
200+ ha	113	0.5	10.41	12	5	4.42
Total horticulture	1,572	1.5	2.23	35	27	1.72
Total for England & Wales	**72,468**	**100**		**1,250**	**1,118**	**1.54**

[1] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2020.*

[2] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2020.*

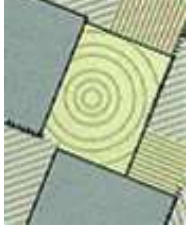


Table A2.2 Derivation of the stratified random sample for the 2020 Survey, Scotland

	farm holdings in population in 2020	total crops and grass in 2020 (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	692	1.3	0.48	3	6	0.87
51-100 ha	915	3.8	1.04	10	7	0.77
101-200 ha	945	7.7	2.03	19	16	1.69
200+ ha	595	11.9	5.01	30	19	3.19
Total cereal/general	3,147	24.8	1.97	62	48	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	4,325	8.1	0.47	20	18	0.42
51-100 ha	3,586	14.7	1.02	37	37	1.03
101-200 ha	2,955	23.4	1.98	58	52	1.76
200+ ha	1,532	29.1	4.76	73	63	4.11
Total livestock & mixed	12,398	75.2	1.52	188	170	1.37
Total for Scotland	**15,545**	**100**		**250**	**218**	**1.40**

[1] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2020.*

[2] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2020.*

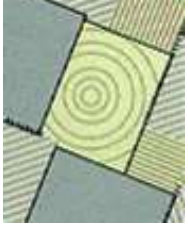
A2.2 DATA COLLECTION

To comply with English, Scottish and Welsh Government Covid-19 regulations, data collection was done between July 2020 and November 2020 almost exclusively via telephone interviews 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 1966 are shown in Table B2.7. These data are based on BSFP findings, HMRC import/export statistics and confidential trade and sales data which are contributed by Agricultural Industries Confederation (AIC) industry members who represent approximately 90% of the market. They are compiled by the AIC 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.

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. 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 50% was achieved in 2020. 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 the grouped 'all tillage' and 'all crops and grass', and for 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 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 because 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 their own farm, are not captured in the Survey.

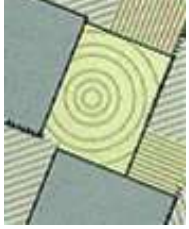
The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England and Wales due to its greater area of total crops and grassland: about 9.37 million hectares in England and Wales and about 1.85 million hectares in Scotland. The estimates of the average 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 considers both the average field rate and the proportion of the crop area treated, giving an overview of the crop in total. 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, thus may not be wholly representative of manure use. 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 1966 are shown in Table B2.7. 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 AIC 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 considers use on small farms (<20 ha) and use in Northern Ireland.

The AIC survey their relevant 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.

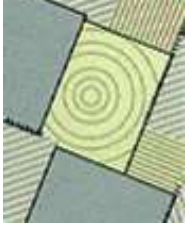
These AIC usage figures are compared to usage figures derived from BSFP and June crop area figures and the relationship between the ratios of N, P and K from both sets of data are checked and compared. Any inconsistencies or anomalies identified in the data are identified and followed up and any necessary 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, considering 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. Information will be provided on any further revisions made to the report or to the datasets if any inaccuracies or errors are found.



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 2019 to autumn 2020, corresponding to the 2020 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 2019. 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 and fertilisers) were recorded separately. Agricultural land which had been set-aside under the Basic 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 Basic Payment Scheme. **Grass** refers to all forms of grassland which may be grazed, conserved, or grown for seed production; rough grazing is excluded.

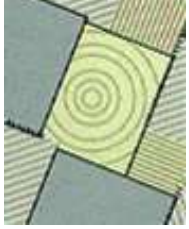
5. The abbreviation **N** is used for nitrogen, **P_2O_5** for phosphate, **K_2O** for potash, **SO_3** for sulphur, and **FYM** for all types of organic manure e.g., slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. 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 Nutrient Management Guide (RB209) which is available at https://ahdb.org.uk/nutrient-management-guide-rb209.

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 based on 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:

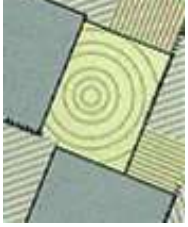
   https://www.gov.uk/structure-of-the-agricultural-industry-survey-notes-and-guidance

   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 2020. 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 for crops to achieve their optimal 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 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.

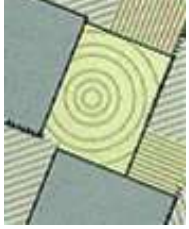
Nitrogen is important for building DNA and proteins in plants. It encourages growth of stems and leaves by promoting protein and chlorophyll. Provided there are adequate supplies of water and other nutrients, nitrogen usually has a large effect on crop growth, yield and quality. Whatever the source, to be usable by plants, it must 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 in this Report as P_2O_5. Phosphate fertilisers include ammonium phosphate and superphosphate. The majority of phosphorus in most soil is in essentially insoluble forms, and unavailable to plants. Phosphorus is very immobile in soil, and the forms that are created and their availability, are dependent on factors such as the soil pH, temperature, and moisture. Plant roots take up nearly all phosphorus as either the primary or secondary orthophosphate anion ($H_2PO_4^-$ or HPO_4^{-2}, respectively). Generally, the maximum availability of phosphorus occurs in soils within a pH range of 6.0-7.0.

Potassium contributes to many plant functions apart from managing the water status, including shoot and root tip growth, cell extension, photosynthesis and the reduction of drought and disease stress. It is used in the process of building and transporting starches, sugars, and proteins, so is important for grain and fruit yield. Potassium chloride (commonly called muriate of potash) is the most common form of potassium fertiliser used in agriculture. Other forms include potassium sulphate, potassium magnesium sulphate and potassium nitrate. In the context of fertilisers, it is measured and defined in this Report as K_2O. It is usually taken up from the soil in greater quantities than the other main fertilisers. 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. It is measured and defined in this Report as SO_3.

More details are provided in the Nutrient Management Guide (RB209). Agriculture and Horticulture Development Board (AHDB). https://ahdb.org.uk/nutrient-management-guide-rb209



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 2018/19 and 2019/20 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 2020, of which 4.4 million hectares (40%) were cultivated for tillage cropping and the remainder, 6.5 million hectares, were grassland (excluding rough grazing).

The Basic Payment Scheme was introduced in 2015 and replaced the Single Farm Payment, (introduced in 2005 to replace 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 may remain un-cropped. In this report, as was the case for the last 10 years, all calculations of fertiliser rates have been made based on sown area rather than field size.

Table A3.1 Cropping and grassland areas ('000 ha) in Great Britain, 2019 – 2020

Crops	June 2019 '000s ha	June 2020 '000s ha	% change since 2019	% change since 2015	2020 crop areas as % of total tillage area
Wheat	1,808	1,380	-23.7	-24.4	31.5
Barley – winter	444	304	-31.7	-30.0	6.9
– spring	698	1,063	52.3	65.1	24.2
Total cereals[1]	*3,181*	*3,009*	*-5.4*	*-1.9*	*68.6*
Oilseed rape – total	*529*	380	-28.3	-41.7	8.7
– winter	524	365	-30.5	-43.4	8.3
– spring	5	14	180.0	100.0	0.3
Sugar beet	108	111	2.8	23.3	2.5
Potatoes[2]	140	138	-1.4	10.6	3.2
Linseed	15	33	120.0	120.0	0.8
Peas/beans[3]	177	233	30.9	9.4	5.3
Maize/other fodder	320	330	3.7	27.5	7.5
Vegetables	113	117	2.6	-25.6	2.7
Total tillage[4]	*4,623*	*4,386*	*-5.1*	*-5.0*	*100.0*
Bare fallow[5]	234	362	61.6	70.0	
Grassland					2020 grass areas as % of total grass area
Less than 5 years old	1,045	1,040	-0.4	2.2	16.0
5 years and older	5,547	5,443	-1.9	0.3	84.0
Total grass[6]	*6,592*	*6,483*	*-1.6*	*0.6*	*100.0*
Total crops and grass[7]	*11,215*	*10,869*	*-3.1*	*-1.8*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not fruit, protected cropping, ornamentals or bare fallow.
[5] Historically including set-aside.
[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 2019 and 2020 cropping years, the area sown to cereals remains largely consistent. Summarised below, the marked swing to spring barley (52%) reflected difficulties in establishing winter wheat and barley crops during autumn 2019. Oilseed rape has declined further again reflecting weather-related challenges during planting and in part due to difficulty in managing pests on this crop. An increase in the areas of pulses (31%) and linseed (120%) were observed in 2020.

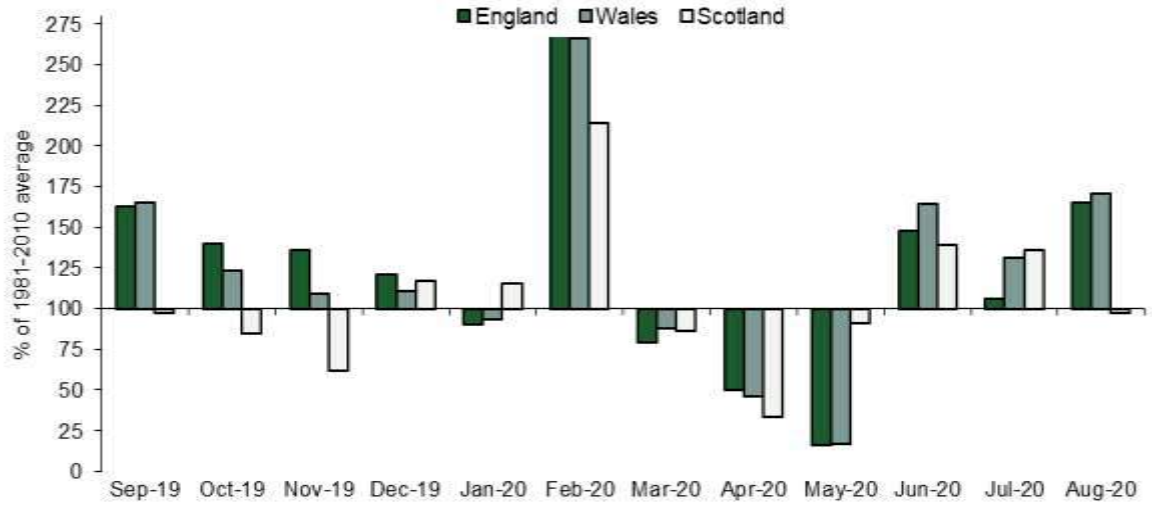
Unusual seasonal weather conditions can influence fertiliser usage in some years. For example:

- 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.

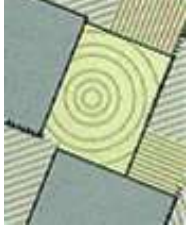
Autumn 2019 was very wet in England and Wales. After a settled, dry, and sunny spell in mid-September, most of the UK was very wet by the end of September, and this unsettled theme persisted for most of October and November. With the jet stream regularly tracking further south than usual, much of England and Wales were wetter and duller than average for October and November, but parts of Scotland were relatively sunny and dry. The winter was notably milder than average, and broadly unsettled, though with a few interludes of quieter weather. February was particularly wet and stormy, and included three named storms, with widespread high rainfall totals and associated impacts. Frosts were fewer than average, and, although there were some snowfalls in certain areas, these were of limited severity. Overall, it was the fifth mildest winter in a series from 1884, and the fifth wettest since 1862. This wet weather in autumn and winter led to the largest shift away from winter drilled crops of the 21st Century.

The spring was warmer than average, mostly due to a very warm April, and also drier and much sunnier than average. The first half of March continued the unsettled theme of the preceding winter, but after that any interludes of unsettled weather were short-lived and rainfall was notably below average. The summer saw temperatures averaging out slightly above average, especially in the south-east, with June and August being warmer than average, but July rather cooler. After the sunny and dry spring, these three months were mostly unsettled, but each summer month did contain some hot weather. Many places had plenty of rain through the summer, and sunshine was below average for most areas.[6]

Figure A3.1 Monthly rainfall as a percentage of the long-term average[7]



[6] https://www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index
[7] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-temperature-rainfall-and-sunshine-anomaly-graphs



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 2016-20. 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 2019-20 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 considers 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 9.0 million hectares in England & Wales and about 1.9 million hectares in Scotland. In what is otherwise a commentary on Britain as a whole, remarks on the separate regions are only made to highlight particular trends of interest. Readers interested in more detailed recent trends for individual crops in England & Wales or in Scotland can refer to tables presented in Section C. A summary of data from earlier years is available in Chalmers 2001[8] and historic data for the key data series are also available at https://www.gov.uk/government/collections/fertiliser-usage.

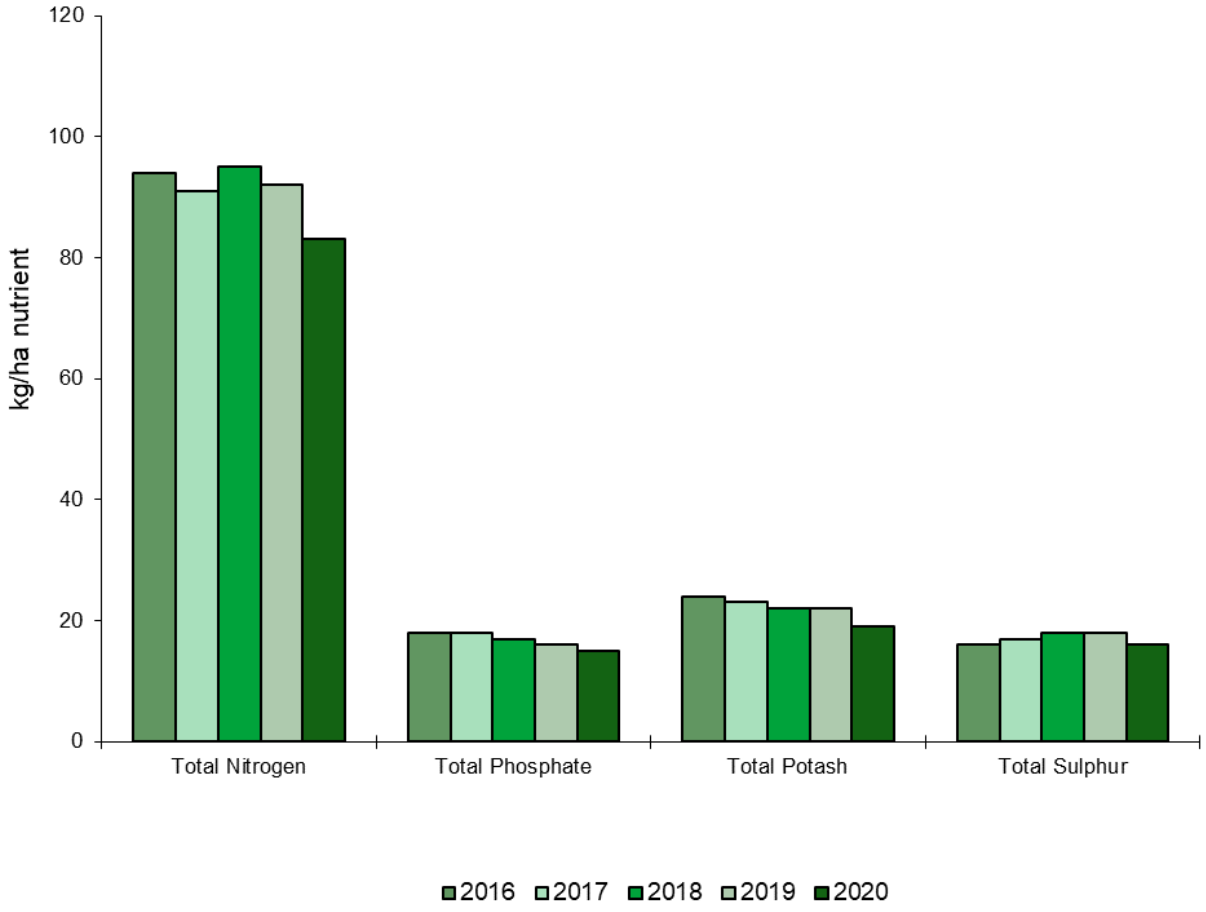
[8] Chalmers A. G. (2001) A Review of fertiliser, lime and organic manure use on farm crops in Great Britain from 1983 to 1997. *Soil Use and Management* **17**, 254-262.

B1 2020 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, potash and sulphur in Great Britain over the last five years are illustrated in Figure B1.1. The 2020, overall rate of nitrogen for all crops and grass is 83 kg/ha, a decrease of 9 kg/ha from 2019. Overall rates for phosphate, potash and sulphur in 2020 were 15 kg/ha, 19 kg/ha and 16 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 2016 – 2020



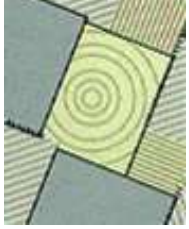
B1.1.1 Nitrogen

All crops and grassland

Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2016 – 2020

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2016	141	56	94
2017	137	54	91
2018	142	57	95
2019	137	54	92
2020	121	53	83



Straight nitrogen

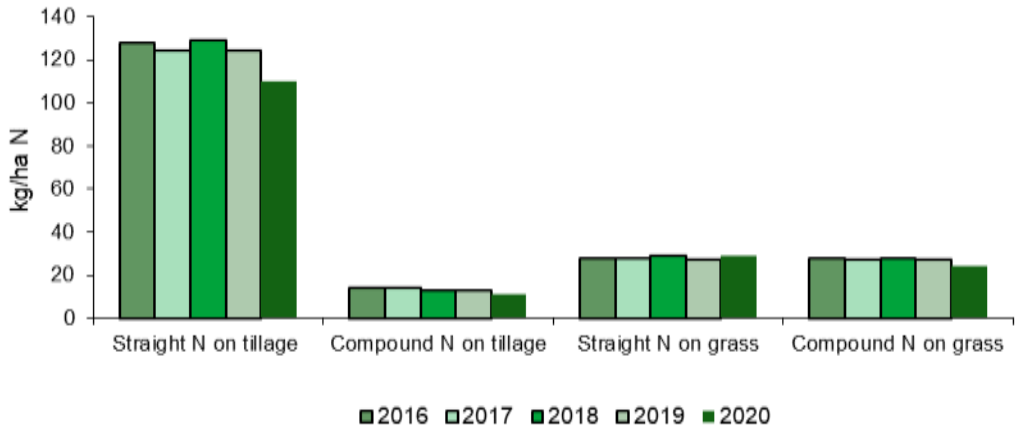
	tillage crops	*grass*	*all crops and grass*
2016	128	28	73
2017	124	28	70
2018	129	29	74
2019	124	27	71
2020	110	29	65

Compound nitrogen

	tillage crops	*grass*	*all crops and grass*
2016	14	28	21
2017	14	27	21
2018	13	28	21
2019	13	27	20
2020	11	24	18

Overall, the 9 kg/ha decrease in the rate of nitrogen for all crops and grass in 2020 (Figure B1.1) was caused by a 16 kg/ha decrease on all tillage crops and a 1 kg/ha decrease on grass. When compared with 2019, the rate of straight N decreased by 14 kg/ha for tillage crops but increased by 2 kg/ha for grass (Figure B1.2). The rate of compound N decreased by 2 kg/ha on tillage crops and by 3 kg/ha on grass. The mean rate of use of total N, straight N and compound N on all crops and grass over the five-year period (2016-2020), is 91 kg/ha, 71 kg/ha and 20 kg/ha, respectively.

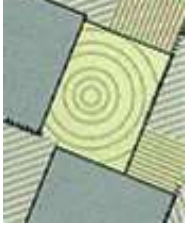
Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2016 – 2020



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 82% in 2020. This was down 2% from 2019. The average field rate of straight N on tillage crops decreased by 13 kg/ha to 136 kg/ha. This resulted in a 3 kg/ha decrease in the overall application rate of straight N which was 121 kg/ha in 2020.

There are a several 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 47% of the tillage area was sown to winter cereals and winter oilseed rape in 2020. These crops can 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 separation of nitrogen applications from those of phosphate and potash for spring-sown crops, especially spring cereals and sugar beet. Thus, a continuing increase in the use of straight nitrogen now applies to most spring-sown crops for agronomic and environmental reasons, as well as for the optimisation of logistics and the efficient use of time in the spring. The exception is maincrop potatoes where compound nitrogen accounted for 86% of dressing cover in 2020.



In the context of this report and elsewhere, straight nitrogen includes nitrogen plus sulphur fertiliser products. The term “straight nitrogen” denotes a nitrogen-containing product without any associated phosphate or potash.

Grassland

In 2020, the overall application rate for nitrogen on grass decreased by 1 kg to 53 kg/ha. Whilst the proportion of grass receiving a dressing of straight N has remained unchanged at 27% since 2015, the average field rate increased by 5 kg/ha to 108 kg/ha. In contrast, the crop area dressed with compound N decreased 2% to 36% and the average field rate declined by 3 kg/ha to 67 kg/ha. Overall, this resulted in a 3 kg/ha decrease to 24 kg/ha in the overall application rate of compound N in 2020.

B1.1.2 Phosphate, Potash and Sulphur

Phosphate

Table B1.2a shows overall phosphate applications for the past five years. Compared with 2019, the overall rate of use on tillage crops decreased to 24 kg/ha. This resulted from a 2% decrease in dressing cover to 46% and a decreased average field rate of 52 kg/ha of phosphate on all tillage crops in 2020. For grassland, whilst the overall rate is unchanged (8 kg/ha) since 2017, the dressing cover decreased by 2% to 35% and the average field rate increased 1 kg/ha to 22 kg/ha. The five year means for overall phosphate rates for tillage crops and grass were 27 kg/ha and 8 kg/ha, respectively.

Table B1.2a Overall phosphate and potash use (kg/ha), Great Britain 2016 – 2020

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2016	29	9	18
2017	30	8	18
2018	27	8	17
2019	26	8	16
2020	24	8	15

Total potash

	tillage crops	*grass*	*all crops and grass*
2016	39	12	24
2017	37	12	23
2018	35	12	22
2019	34	11	22
2020	29	11	19

Potash

On tillage crops, the decline in the overall potash rate was caused by a 3 kg/ha reduction in the average field rate to 66 kg/ha alongside a 6% decrease in dressing cover to 44% in 2020. On grassland, dressing cover reduced by 2% to 39% and overall rate of use was unchanged at 11 kg/ha, whilst the average field rate increased by 2 kg/ha to 31 kg/ha. The five year means for overall potash rates for tillage crops and grass were 35 and 12 kg/ha, respectively.

Sulphur

Table B1.2b shows overall sulphur (SO_3) applications for the past five years. In 2020, the overall application rate of sulphur on tillage crops reduced by 4 kg/ha to 31 kg/ha, but remained unchanged on grass at 5 kg/ha. The proportion of the tillage area receiving a sulphur dressing decreased by 3% to 59%. However, average field rate decreased by 3 kg/ha to 53 kg/ha, leaving the overall rate at 31 kg/ha. The overall rate of sulphur on grass was unchanged (5 kg/ha). The low overall rate of sulphur on grass is caused by a combination of lower dressing cover percentages and average field rates on grass than on tillage crops.

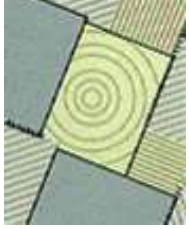


Table B1.2b Overall sulphur use (kg/ha SO_3), Great Britain 2016 – 2020

Total sulphur

	tillage crops	*grass*	*all crops and grass*
2016	31	3	16
2017	34	3	17
2018	35	4	18
2019	35	5	18
2020	31	5	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 2020 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.

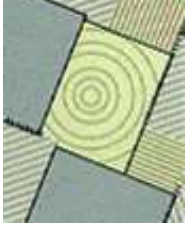


Table B1.3a Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2016 – 2020

Total nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	188	104	146	134	180	97
2017	185	100	149	136	180	92
2018	186	101	143	143	188	82
2019	185	95	143	150	180	74
2020	177	99	139	118	168	69

Straight nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	182	71	137	36	171	86
2017	177	70	140	39	170	83
2018	179	74	137	42	179	73
2019	178	70	135	81	170	69
2020	172	80	131	27	158	58

Compound nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	6	33	9	98	9	11
2017	6	30	8	97	10	10
2018	7	27	6	101	9	9
2019	8	25	9	69	10	6
2020	5	19	8	91	9	11

Total phosphate	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	27	33	29	110	29	17
2017	29	32	30	114	33	17
2018	26	31	27	101	27	18
2019	24	30	27	89	29	17
2020	24	25	26	91	27	22

Total potash	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	33	46	41	186	29	51
2017	36	43	40	206	31	46
2018	31	42	34	208	27	44
2019	31	39	37	164	27	50
2020	29	29	38	159	26	44

Total sulphur	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	36	24	34		59	28
2017	40	24	40		64	39
2018	41	25	34		61	25
2019	42	24	38		63	31
2020	42	24	36		64	33

[1] 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.
[2] Single crop grouping for the combined winter and spring oilseed rape areas.

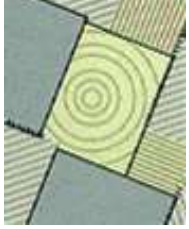


Table B1.3b Average field rates (kg/ha) on major tillage crops, Great Britain 2016 – 2020

Total nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	192	106	148	142	183	99
2017	188	103	152	136	181	96
2018	189	104	146	144	190	83
2019	187	97	145	153	181	78
2020	179	102	141	130	169	71

Straight nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	190	95	144	101	177	89
2017	184	93	147	91	174	88
2018	185	96	143	99	182	78
2019	183	87	141	147	173	80
2020	176	94	137	94	161	66

Compound nitrogen	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	51	64	61	118	39	50
2017	80	56	67	119	34	42
2018	60	56	50	116	37	49
2019	62	50	55	107	34	31
2020	45	53	43	105	34	30

Total phosphate	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	60	50	56	125	57	48
2017	64	49	60	130	58	40
2018	60	50	61	114	57	41
2019	57	48	53	112	57	47
2020	55	47	50	107	54	42

Total potash	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	71	68	70	213	67	88
2017	75	62	74	226	64	78
2018	70	66	74	218	65	79
2019	67	61	68	185	61	88
2020	63	59	67	175	60	75

Total sulphur	winter wheat	spring barley	winter barley	maincrop potatoes [1]	oilseed rape [2]	sugar beet
2016	56	42	59		84	49
2017	58	44	60		84	74
2018	56	45	50		77	39
2019	59	41	55		77	49
2020	57	43	47		77	47

[1] 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.
[2] Single crop grouping for the combined winter and spring oilseed rape areas.

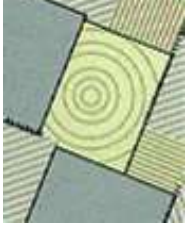


Table B1.4 Dressing cover (% area) on major tillage crops, Great Britain 2016 – 2020

Total nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	98	98	99	94	98	98
2017	99	97	98	100	100	96
2018	98	97	98	100	99	98
2019	99	98	99	98	99	95
2020	99	98	98	91	99	98

Straight nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	96	75	95	35	97	97
2017	96	75	95	43	98	94
2018	97	77	95	43	98	93
2019	97	80	96	55	98	87
2020	98	85	95	29	99	88

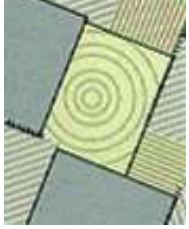
Compound nitrogen	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	11	52	15	83	23	22
2017	10	54	12	82	28	23
2018	11	47	12	87	25	18
2019	12	50	16	64	29	18
2020	11	36	19	86	27	37

Total phosphate	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	45	65	52	88	51	35
2017	46	66	50	88	57	43
2018	42	63	44	88	47	43
2019	42	63	50	79	52	37
2020	44	52	52	85	50	52

Total potash	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	46	67	58	87	43	58
2017	47	70	54	91	48	59
2018	44	64	46	95	41	56
2019	46	64	54	88	44	57
2020	46	50	57	91	43	59

Total sulphur	*winter wheat*	*spring barley*	*winter barley*	*maincrop potatoes* [1]	*oilseed rape* [2]	*sugar beet*
2016	63	56	57	29	70	58
2017	69	55	66	20	76	53
2018	73	56	67	27	80	63
2019	72	59	70	32	82	63
2020	73	54	76	14	83	69

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



B1.2.1 Nitrogen

In 2020, overall rates of total nitrogen (Table B1.3a) decreased for all major crops except spring barley where the rate increased 4 kg/ha to 99 kg/ha over 2019. Average field rates (Table B1.3b) followed a similar pattern with decreases on all of the major crops except spring barley where straight N rates increased by 7 kg/ha to 94 kg/ha and compound N by 3 kg/ha to 53 kg/ha. For all major arable crops dressing cover approached 100% except maincrop potatoes, which tend to be more variable (Table B1.4).

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 2016 – 2020

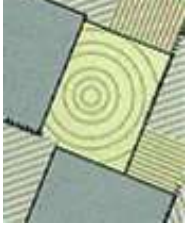
Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2016	206	185	112	100	127	153
2017	204	179	108	97	134	157
2018	207	180	108	99	126	152
2019	201	179	100	94	129	149
2020	194	169	102	101	126	146

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 to avoid any risk of lower grain protein due to a high yield diluting the grain nitrogen concentration for a first wheat in the rotation. The average field application rate on milling wheat decreased by 7 kg/ha to 194 kg/ha, and the rate on non-milling wheat decreased by 10 kg/ha to 169 kg/ha compared with 2019. Many crops emerged from a wet winter with low plant populations in 2020. The non-milling crop continues to dominate the wheat crop area (Table B1.6) with 59% of the crop year (5-year mean: 64%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2016 – 2020, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2016	34	66	53	47	19	81
2017	36	64	54	46	22	78
2018	34	66	57	43	21	79
2019	36	64	60	40	18	82
2020	41	59	51	49	23	77



Spring barley

Overall use of total nitrogen on spring barley increased by 4 kg/ha to 99 kg/ha, just below the five-year mean (2016-2020) of 100 kg/ha. The rate of straight N decreased by 10 kg/ha to 80 kg/ha whilst the overall application rate of compound N decreased by 6 kg/ha compared with 2019 to 19 kg/ha. The average field rate for straight N increased by 7 kg/ha and the rate for compound N increased by 3 kg/ha compared with 2019. The percentage of the spring barley area receiving a dressing of straight N increased by 5% to 85%, and dressing cover with compound N decreased by 14% to 36% (Table B1.4).

Further analysis of the data by crop type (Table B1.5) shows the average field rate applied to malting barley was increased by 2 kg/ha to 102 kg/ha and to non-malting by 7 kg/ha to 101 kg/ha. In the case of the spring malting crop the five-year mean is 106 kg/ha, whilst for non-malting crops the mean is 98 kg/ha.

Estimated nitrogen rates on spring barley crops has been consistently a little higher on malting than non-malting crops. 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 in the range recommended for mineral soil types with low nitrogen residues (70 - 120 kg/ha)[9]. Feed crops on the other hand are often grown within mixed rotations, which tend to have a higher soil nitrogen fertility, with consequently less need for nitrogen fertiliser.

The proportion of spring barley grown for malting has fluctuated during the last five years (Table B1.6). The mean for the period 2016-20 is 55%, with the lowest proportion recorded in 2020 at 51%.

Winter barley

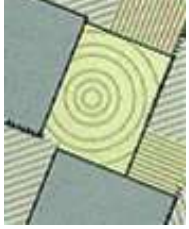
In the period 2002-08 overall total nitrogen use on winter barley decreased from year to year, down to 132 kg/ha in 2008. This rate then increased albeit with some fluctuations to 2017, but in 2018 the rate decreased by 6 kg/ha to 143 kg/ha. In 2020, overall total N rate decreased by 4 kg/ha to 139 kg/ha. The rate of straight N, which was used on 95% of the winter barley crop area, decreased by 4 kg/ha to 131 kg/ha in 2020, lower than the five year (2016-20) mean of 136 kg/ha. The compound N overall rate decreased by 1 kg/ha to the five year (2016-20) mean of 8 kg/ha.

As with the spring sown crop, nitrogen requirements for winter barley depend on a range of agronomic factors, such as the intended market for the grain. Average field rates of nitrogen on malting crops decreased by 3 kg/ha over 2019 to 126 kg/ha, below the five-year mean of 128 kg/ha. For non-malting crops, the average field rate also decreased by 3 kg/ha to 146 kg/ha (Table B1.5), again below the five-year average of 151 kg/ha.

The higher application rates of nitrogen (five-year mean of +20 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 crop area grown for malting was 23% in 2020, 5% higher than 2019, with the five-year mean calculated as 21%. (Table B1.6).

[9] Anon. (2018). Nutrient Management Guide (RB209). Agriculture and Horticulture Development Board (AHDB). https://ahdb.org.uk/nutrient-management-guide-rb209



Maincrop potatoes

Total nitrogen use on maincrop potatoes has fluctuated over the last five years. Part of the reason for recent apparent fluctuations in the estimates of nutrient application rates may be because proportionally fewer fields of potatoes are covered by the Survey. This is because fields of potatoes on respondents' 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 2020, the overall rate of nitrogen decreased by 32 kg to 118 kg/ha, which is below the five-year mean of 136 kg/ha (Table B1.3a).

Oilseed rape

In 2020, overall total nitrogen and average field rate use on oilseed rape, as a combined category for both the autumn and spring sown crop, decreased by 12 kg/ha to 168 kg/ha and to 169 kg/ha, respectively; five-year means of 179 kg/ha and 181 kg/ha, respectively (Table B1.3a, B1.3b). Whilst the crop area dressed with straight N increased by 1% (to 99%), and decreased by 2% for compound N (to 27%) (table B1.4), the change in overall N of 12 kg/ha (to 168 kg/ha) was caused by a decrease in average field rates of 8 kg/ha in straight N, average rates for compound N being unchanged (34 kg/ha) (Table B1.3b).

A more detailed breakdown of the data for oilseed rape (Table B1.7) shows that the average field rate of nitrogen on winter oilseed rape decreased by 10 kg/ha to 172 kg/ha. Compared with 2019, the rate for the spring crop decreased 13 kg/ha to 87 kg/ha. In a normal year spring rape represents only about 1-2% 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 2016 – 2020

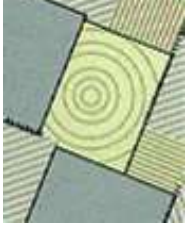
Total nitrogen (kg/ha)

	winter oilseed rape	*spring oilseed rape* [1]
2016	184	132
2017	181	116
2018	191	91
2019	182	120
2020	172	87

[1] Spring oilseed rape data are more variable due to smaller crop area

Sugar beet

The overall nitrogen use on sugar beet decreased by 5 kg/ha in 2020 to 69 kg/ha, considerably below the five-year mean (83 kg/ha). Use of straight N, by far the most widely used form of nitrogen in this crop (five-year mean: 92% of the dressed area), was down 11 kg/ha to 58 kg/ha (Table B1.3a, B1.4). The average field rate of straight N decreased to 66 kg/ha, or 14 kg/ha below the five-year mean of 80 kg/ha, whereas the average rate of the less used compound N decreased by 1 kg/ha to 30 kg/ha (Table B1.3b).



B1.2.2 Phosphate and Potash

Phosphate

In 2020, the overall rate of phosphate decreased for barley (spring and winter) and oilseed rape, was unchanged for winter wheat, and increased for maincrop potatoes and sugar beet (Table B1.3a). Except potatoes and sugar beet, where the average field rate decreased by 5 kg/ha, average field rates for all other major crops decreased by 1 to 3 kg/ha, the latter rate for winter barley and oilseed rape (Table B1.3b). In 2020, the overall phosphate rate declined 2 kg/ha to 24 kg/ha (Table B1.2a), below the 2015-19 five-year average (27 kg/ha), and may be due to the abnormal crop mix caused by the weather in autumn 2019.

Potash

Overall, potash use on tillage crops decreased in 2020 by 5 kg/ha to 29 kg/ha, below the 2015-2019 five-year average of 35 kg/ha (Table B1.2a). This decline was due to a reduction in dressing cover from 50% to 44% and in the average field rate from 69 kg/ha to 66 kg/ha. For major tillage crops except winter barley, the overall rate of potash decreased by up to 10 kg/ha, being greatest for sugar beet (-6 kg/ha) and for spring barley (-10 kg/ha); a small increase in overall rate of potash of 1 kg/ha was recorded for winter barley (Table B1.3a). Dressing covers increased by 3% for winter barley and potatoes and by 2% for sugar beet, remained unchanged for winter wheat, and decreased by 1% and 14% for oilseed rape and spring barley, respectively (Table B1.4). For all major tillage crops, average field rates decreased between 1 and 13 kg/ha, the decrease in rate being greatest for potatoes (-10 kg/ha) and sugar beet (-13 kg/ha) (Table B1.3b).

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 2020, sulphur dressing cover increased on winter wheat and barley, but were lower on other tillage crops (Table B1.8). The average field rates for tillage crops were generally lower than in 2019.

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2016 – 2020

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*	*all tillage*
2016	63	57	56	70	54
2017	69	66	55	76	57
2018	73	67	56	80	62
2019	72	70	59	82	62
2020	73	76	54	83	59

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*	*all tillage*
2016	56	59	42	84	58
2017	58	60	44	84	60
2018	56	50	45	77	57
2019	59	55	41	77	56
2020	57	47	43	77	53

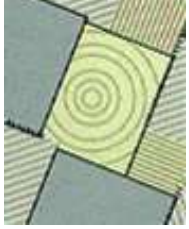


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically, a higher proportion of cereal and oilseed rape crops were treated with sulphur in Scotland than in England & Wales. This may have been due to the greater awareness 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. Dressing covers are now much more closely aligned, and in some cases exceed those recorded in Scotland. Spring barley is an example of this trend, with this possibly being due to the manure which is more commonly applied to this crop in Scotland being assumed to satisfy the sulphur demand. In 2020, 40% of Scottish spring barley received manure compared with 23% in England and Wales.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2016 – 2020

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2016*	65	56	57	71
	2017	69	66	59	77
	2018	72	66	58	79
	2019	72	70	60	82
	2020	73	75	53	83
Scotland [1]	*2016*	49	63	54	59
	2017	68	64	49	66
	2018	79	80	53	88
	2019	69	71	57	73
	2020	79	83	60	78

[1] 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 2016 – 2020

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2016	28	28	56	9	12	3
2017	28	27	54	8	12	3
2018	29	28	57	8	12	4
2019	27	27	54	8	11	5
2020	29	24	53	8	11	5

In 2020, dressing cover for total nitrogen on grass decreased 2% to 56% (Table B1.11). The long-term trend has been for declining dressing cover for total nitrogen and the proportion receiving a dressing is the same as the previous low level 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 62% while for straight N it was 108 kg/ha.

In 2020, the overall application rates for phosphate and potash were the same as in 2019 at 8 kg/ha and 11 kg/ha, respectively (Table B1.10).

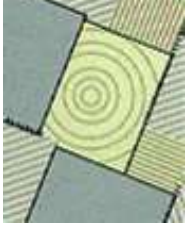


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2016 – 2020

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2016	27	39	58	38	39	9
2017	27	37	56	37	38	10
2018	27	39	59	38	40	12
2019	27	38	58	37	39	14
2020	27	36	56	35	37	15

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*	*total sulphur*
2016	105	71	97	23	31	35
2017	103	73	97	23	31	35
2018	106	72	96	22	29	37
2019	103	70	93	21	29	33
2020	108	67	96	22	31	33

The proportion of the grass area receiving a straight nitrogen dressing was the same as in 2015 at 27% and the compound N dressing cover decreased by 2% to 36% in 2020 (Table B1.11). The dressing cover of phosphate and potash on grass decreased by 2% since 2019 to 35 and 37%, respectively. The five-year means are 37% and 39%, respectively. The sulphur dressing cover increased to a high of 15%.

In 2020, the average field rates for phosphate increased by 1 kg/ha to 22 kg/ha and for potash by 2 kg/ha to 31 kg/ha. The sulphur average field rate was unchanged at 33 kg/ha, below the five-year average of 35 kg/ha.

B1.3.1 Nitrogen

Cutting and grazing management

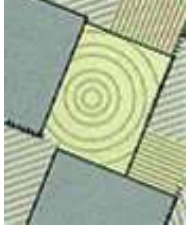
Fertiliser requirements for grassland vary according to the type of livestock enterprise, intensity of production and the associated cutting and grazing regimes used for sward management. Fertiliser use on dairy, other livestock, and mixed farms in Great Britain in 2020 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2016 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 2016 – 2020

	grazed [1]	*silage* [2]	*hay* [2]
2016	92	28	9
2017	93	29	10
2018	93	31	10
2019	93	31	10
2020	94	30	9

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2020 is slightly above the five-year mean of 93%.

[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 generally 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 2016 – 2020

Total nitrogen

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2016	52	103	38	*2016*	93	127	75
2017	52	100	44	*2017*	94	126	83
2018	53	104	50	*2018*	91	126	79
2019	50	100	44	*2019*	89	118	76
2020	50	102	39	*2020*	91	124	75

Straight nitrogen

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2016	26	53	20	*2016*	102	119	93
2017	26	51	27	*2017*	100	120	91
2018	25	55	18	*2018*	100	125	84
2019	24	51	19	*2019*	97	117	82
2020	26	60	20	*2020*	102	128	94

Compound nitrogen

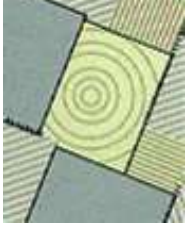
	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2016	26	50	18	*2016*	69	95	55
2017	26	49	17	*2017*	71	96	64
2018	28	48	33	*2018*	71	95	72
2019	26	49	25	*2019*	69	88	65
2020	24	42	19	*2020*	65	82	58

In 2020, the overall total nitrogen rates were unchanged for grazed (50 kg/ha), increased by 2 kg/ha for silage to 102 kg/ha, and decreased by 5 kg/ha for hay to 39 kg/ha. Rates reported on grass cut for hay need to be treated with caution due to the relatively small numbers of grass fields being managed this way (Table B1.13).

The average field rates of straight nitrogen increased for all categories of grass. The five-year means for overall straight nitrogen rate are 25, 54 and 21 kg/ha for grazed grass, silage, and hay, respectively. In contrast, compound nitrogen average field rates decreased in 2020. The five-year means for the overall compound nitrogen rates are 26, 48 and 22 kg/ha for grazed grass, silage, and hay, respectively.

The fall in nitrogen use over the long term on grassland until 2008 is likely to be related in part to decreases in ruminant livestock numbers which may have reduced herbage production requirements. Since that date, the rate of nitrogen application to grassland has remained relatively constant, with the 2020 overall nitrogen rate being 53 kg/ha.

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



B1.3.2 Phosphate and Potash

As for nitrogen, phosphate and potash requirements for grassland depend 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 2016 – 2020

Total phosphate

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2016	8	14	8	*2016*	22	28	23
2017	8	14	8	*2017*	23	28	27
2018	8	14	11	*2018*	22	28	23
2019	8	14	9	*2019*	21	26	23
2020	8	13	8	*2020*	21	28	22

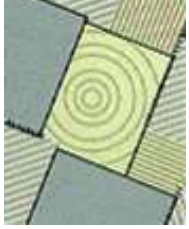
Total potash

	overall application rate				*average field rate*		
	grazed [1]	*silage* [2]	*hay* [2]		*grazed* [1]	*silage* [2]	*hay* [2]
2016	11	24	9	*2016*	29	46	27
2017	11	23	8	*2017*	29	43	29
2018	11	23	14	*2018*	28	41	31
2019	11	22	10	*2019*	28	39	25
2020	11	23	9	*2020*	29	43	26

In 2020, the overall phosphate rate was unchanged for grazed, but decreased by 1 kg/ha for silage and hay. The corresponding five-year means for grazed grass, silage and hay were 8, 14 and 9 kg/ha, respectively. The average field rate for grazed grass was unchanged, increased by 2 kg/ha for silage, and decreased by 1 kg/ha for hay in 2020. Overall, the long-term decline in application rates on grazed grass appears to have levelled out.

Overall potash rates in 2020 remained static for grazed grass (11 kg/ha since 2015), increased by 1 kg/ha for silage and decreased 1 kg/ha for grass cut for hay. The average field rate of potash increased by 1 kg/ha on grazed grass and grass cut for hay, and increased by 4 kg/ha on silage grass.

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



B1.3.3 Sulphur

In 2020, 15% of the total grassland area received a sulphur dressing (mean 12% for 2016-20 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 between 1 and 2% increases for grazed grass and silage grass, respectively and a 2% reduction in hay grass in 2020.

The significant proportion of heavier textured soil types which occur in the main grassland farming areas, together with 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 2016 – 2020

Dressing cover (%)

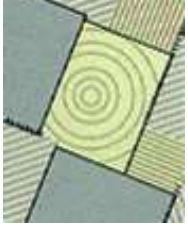
	grazed [1]	*silage* [2]	*hay* [2]	*all grass*
2016	9	16	5	9
2017	9	16	9	10
2018	11	19	12	12
2019	14	25	16	14
2020	15	27	14	15

Average application rate per year (kg/ha SO_3)

	grazed [1]	*silage* [2]	*hay* [2]	*all grass*
2016	35	37	41	35
2017	33	41	42	35
2018	37	41	29	37
2019	33	37	30	33
2020	32	38	28	33

Estimated average field rates of sulphur application peaked for grazed and silage grass in 2007 at 45 kg/ha and 47 kg/ha, respectively and for hay in 2008 at 47 kg/ha. In 2020, compared to 2019 values, average field rates decreased for grazed and hay grass by 1 and 2 kg/ha respectively, and increased by 1 kg/ha for silage grass. The five-year means are 34, 39 and 34 kg/ha SO_3 for grazed, silage and hay grassland, respectively (Table B1.15). Note that the average application rates in Table B1.15 are annual totals, not rates per cut.

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



B2 LONGER TERM TRENDS FOR GREAT BRITAIN

B2.1 NITROGEN USE

The BSFP commenced as an integrated British Survey in 1992. Before then, the annual Survey of Fertiliser Practice had been completed separately for England & Wales and for Scotland. Some survey statistics from those earlier surveys have since been collated 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 1980 - 2020 and Scotland and Great Britain 1983 – 2020

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2016	145	118	141	53	69	56	96	86	94
2017	141	118	137	51	68	54	92	86	91
2018	145	118	142	54	67	57	97	85	95
2019	141	109	137	51	67	54	94	82	92
2020	123	109	121	53	56	53	85	73	83

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 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 major changes in the CAP, the overall rate of total nitrogen on tillage land stayed within the range 140-150 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 estimate for 2020 falls outside of this range, with the overall rate of nitrogen on tillage crops for Great Britain being 121 kg/ha. As with 2013, the low rate recorded in 2020 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. Setting aside the results from the 2020 Survey, where the replacement of winter cereals and rape by spring barley (see Table A3.1) resulted in an overall nitrogen rate of 68 kg/ha, during the last five years the average difference in overall nitrogen rate has remained relatively constant at 85 kg/ha.

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 – 2020

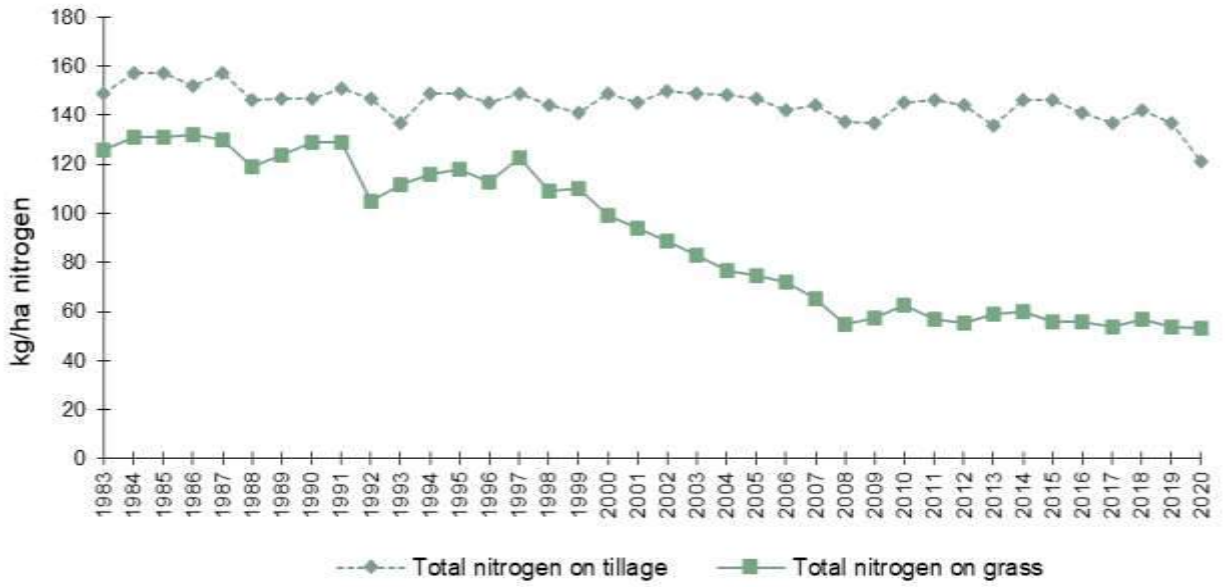
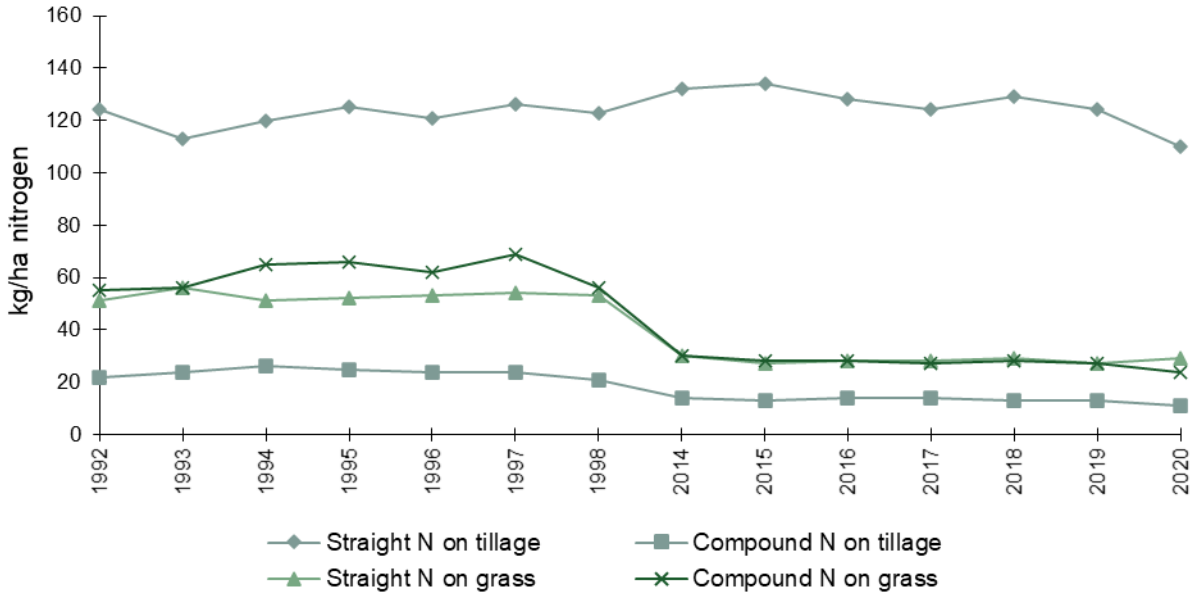


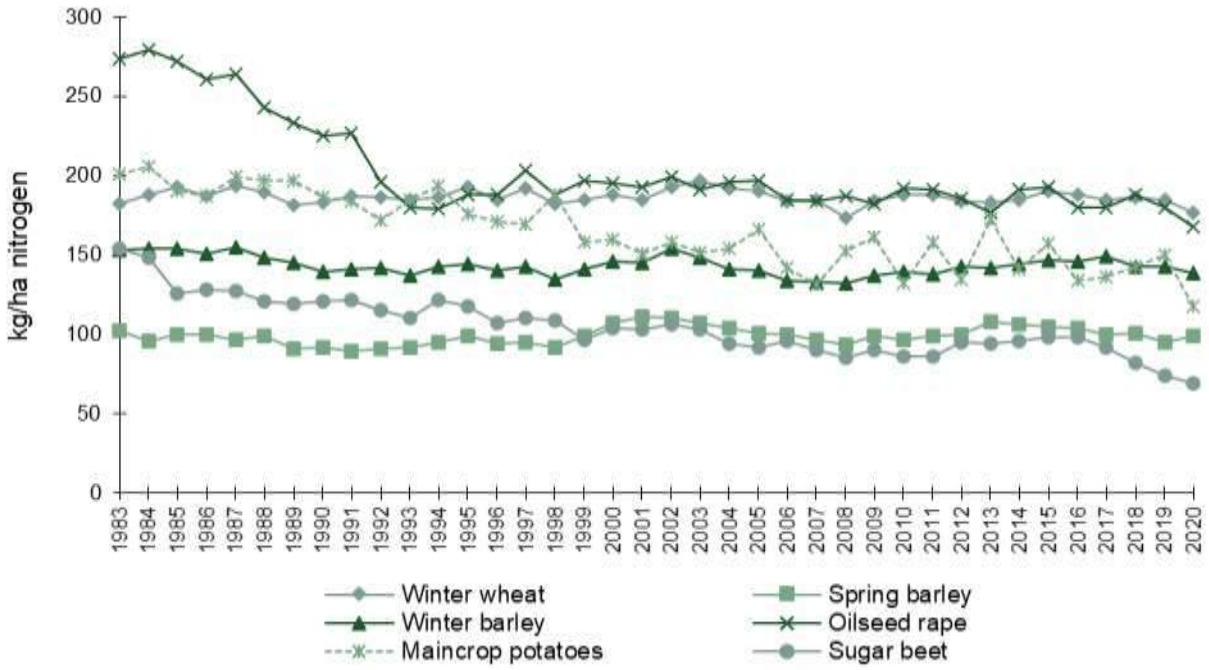
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2020

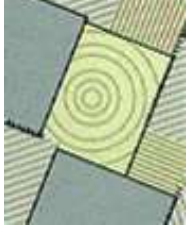


B2.1.1 Nitrogen use on major tillage crops

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 – 2020





B2.1.2 Autumn and winter applications of nitrogen fertiliser

The BSFP 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, with the dressing cover being 7 or below for both in 2020. 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 1989 – 1998 and Great Britain 1999 – 2020**

	winter wheat	*winter barley*	*winter oilseed rape*	
	dressing cover	*dressing cover*	*dressing cover*	*application rate*
England & Wales				
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
2016	3	4	35	31
2017	3	3	42	30
2018	5	4	41	31
2019	3	5	36	28
2020	5	7	36	32

B2.2 PHOSPHATE, POTASH AND SULPHUR USE

Historic annual overall rates of phosphate, potash and sulphur on tillage crops and on grassland in Great Britain illustrated in Figure B2.4a and B2.4b, using the data presented in Tables B2.3, B2.4 and B2.5.

Figure B2.4a Overall application rates (kg/ha) phosphate and potash on tillage crops and grassland, Great Britain 1983 – 2020

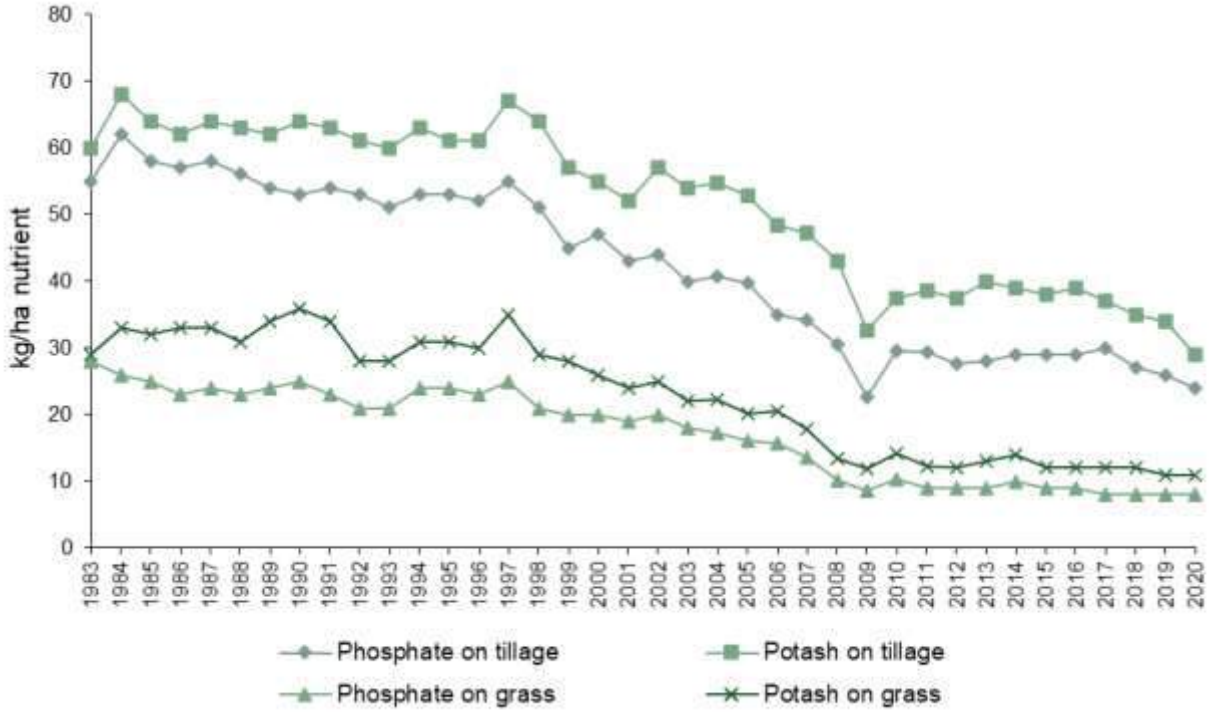
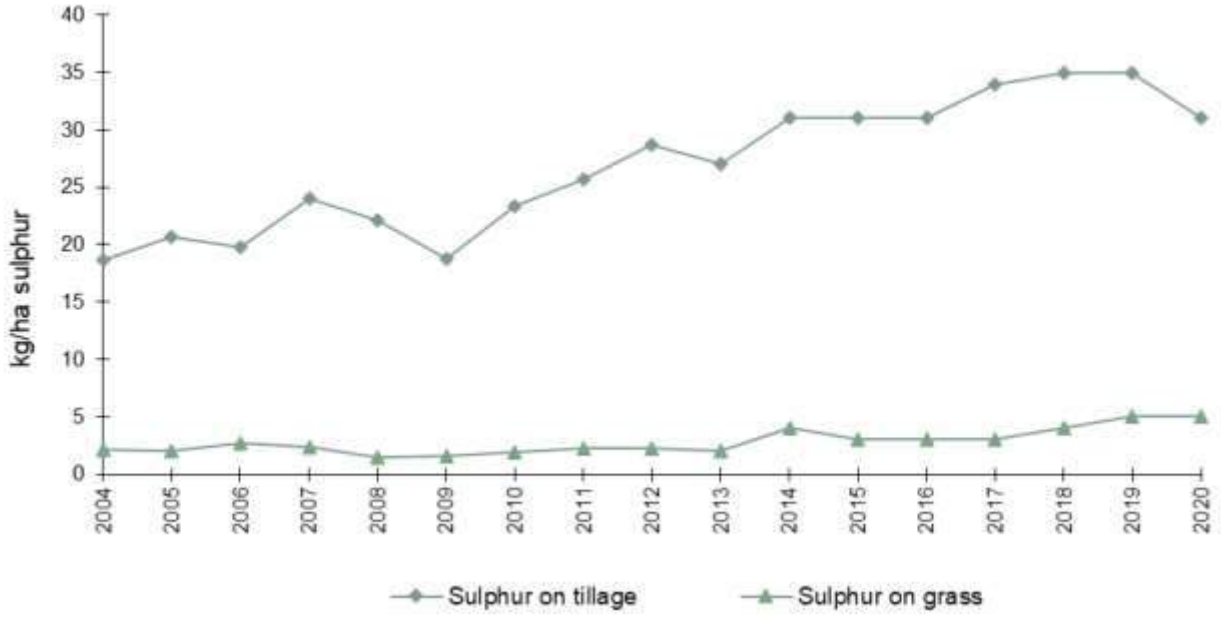
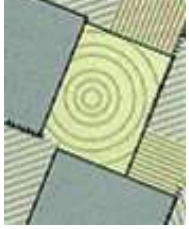


Figure B2.4b Overall application rates (kg/ha) of sulphur (SO_3) on tillage crops and grassland, Great Britain 2004 – 2020





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 at that time. The data suggest that, since 2010, overall application rates of phosphate and potash have remained relatively constant, although decreases of 2 kg/ha (to 24 kg/ha) and 5 kg/ha (to 29 kg/ha), respectively were recorded in 2020. 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 8-10 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 34-40 kg/ha range.

Compared to tillage crops, the pattern of overall potash use on grassland has been more variable. A net decline was shown between 1983 and 2009; since then the rate has remained within the range of 11-14 kg/ha.

Overall sulphur use on tillage crops has increased steadily since 2004, but in 2020 decreased by 4 kg/ha to 31 kg/ha. On grassland the use of sulphur is much lower, but it too has increased, albeit it at a much lower rate. In 2004 the overall application rate was 2 kg/ha and by 2019 this had risen to 5 kg/ha.

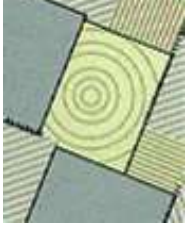


Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1971 - 2020 and Scotland and Great Britain 1983 – 2020

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2016	26	50	29	7	14	9	16	27	18
2017	26	54	30	7	16	8	15	29	18
2018	24	50	27	7	13	8	15	26	17
2019	23	44	26	7	13	8	15	24	16
2020	21	41	24	7	12	8	13	21	15

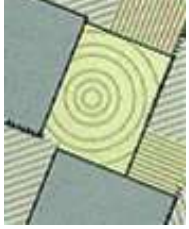


Table B2.4 Overall potash application rates (kg/ha), England & Wales 1971 - 2020 and Scotland and Great Britain 1983 – 2020

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
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
2016	34	68	39	10	20	12	21	36	24
2017	31	71	37	9	21	12	20	39	23
2018	29	73	35	10	18	12	19	38	22
2019	30	60	34	9	20	11	19	34	22
2020	25	56	29	10	18	11	17	30	19

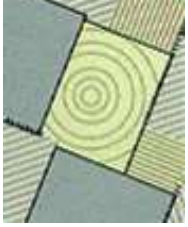


Table B2.5 Overall sulphur (SO_3) application rates (kg/ha), Great Britain 2004 – 2020

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
2004	19	18	19	2	2	2	10	8	9
2005	21	18	21	2	3	2	11	8	11
2006	20	18	20	2	4	3	11	9	11
2007	23	17	24	3	2	2	14	7	13
2008	23	16	22	1	2	2	12	7	11
2009	19	15	19	1	2	2	10	7	10
2010	24	18	23	2	3	2	13	8	12
2011	26	21	26	2	2	2	14	8	13
2012	29	25	29	2	3	2	15	10	14
2013	27	25	27	3	2	2	14	10	13
2014	31	28	31	4	3	4	17	11	16
2015	31	33	31	3	3	3	17	14	16
2016	32	24	31	3	4	3	17	11	16
2017	35	27	34	3	4	3	18	12	17
2018	36	30	35	5	4	4	19	13	18
2019	37	25	35	4	6	5	20	13	18
2020	31	29	31	5	6	5	17	14	16

Overall rates of phosphate and potash applied to tillage crops are approximately three times those used on grassland. However, there is greater use of applied manures on grassland (35% cover) than on tillage crops (26% cover) and grazed grassland also receives manure as it is grazed.

Annual overall rates of sulphur on tillage crops and on grassland in Great Britain since 2004 are presented in Table B2.5 and are illustrated in Figure B2.4b.

Dressing covers of phosphate and potash on tillage and grass for the period 2004-20 are presented in Tables B2.6a and B2.6b. 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 (34% 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 10 years.

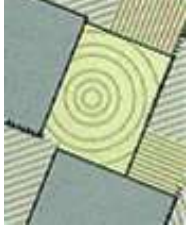


Table B2.6a Phosphate dressing covers (%), Great Britain 2004 – 2020

	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
2016	44	85	49	32	63	38	37	70	43
2017	44	91	50	30	65	38	36	75	43
2018	41	87	48	33	57	38	37	68	42
2019	43	83	48	32	58	37	37	67	42
2020	40	85	46	31	53	35	35	63	40

Table B2.6b Potash dressing covers (%), Great Britain 2004 – 2020

	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
2016	44	87	50	33	64	39	38	72	44
2017	44	91	50	31	66	38	37	75	43
2018	41	88	47	35	59	40	38	69	43
2019	44	83	50	34	60	39	39	68	44
2020	39	84	44	33	54	37	35	64	40

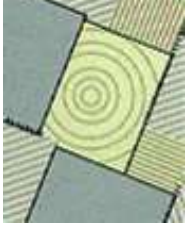
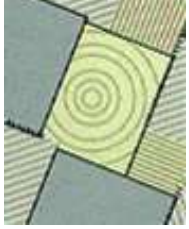


Table B2.6c Sulphur dressing covers (%), Great Britain 2004 – 2020

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
2004	32	39	33	5	9	6	17	20	18
2005	35	36	35	5	9	6	19	19	19
2006	38	41	38	6	12	7	21	22	21
2007	42	36	42	5	6	5	24	17	23
2008	41	32	40	4	6	5	22	15	21
2009	35	36	35	5	7	5	20	17	20
2010	39	43	40	5	9	6	22	20	22
2011	42	42	42	6	7	6	24	19	23
2012	47	46	47	6	10	7	26	22	25
2013	47	41	47	8	8	8	26	19	25
2014	52	47	51	11	9	11	30	21	29
2015	53	48	52	9	12	10	31	25	30
2016	55	49	54	9	11	9	30	24	29
2017	58	53	57	9	12	10	32	27	31
2018	62	58	62	11	12	12	35	28	34
2019	63	58	62	13	20	14	36	33	36
2020	58	60	59	14	21	15	34	34	34

Sulphur dressing covers have increased since 2004 on tillage crops in all countries. At the start of the period, they were generally higher in Scotland than in England and Wales. In the last five years sulphur dressing covers have plateaued, although in 2020 they were slightly higher in Scotland than in England and Wales. Dressing covers on grass are lower than those observed on tillage crops. They have increased since 2004 and in the last five years have tended to be higher in Scotland (mean 15 kg/ha) than in England and Wales (mean 11 kg/ha).



B2.2.1 Phosphate, potash and sulphur use on major tillage crops

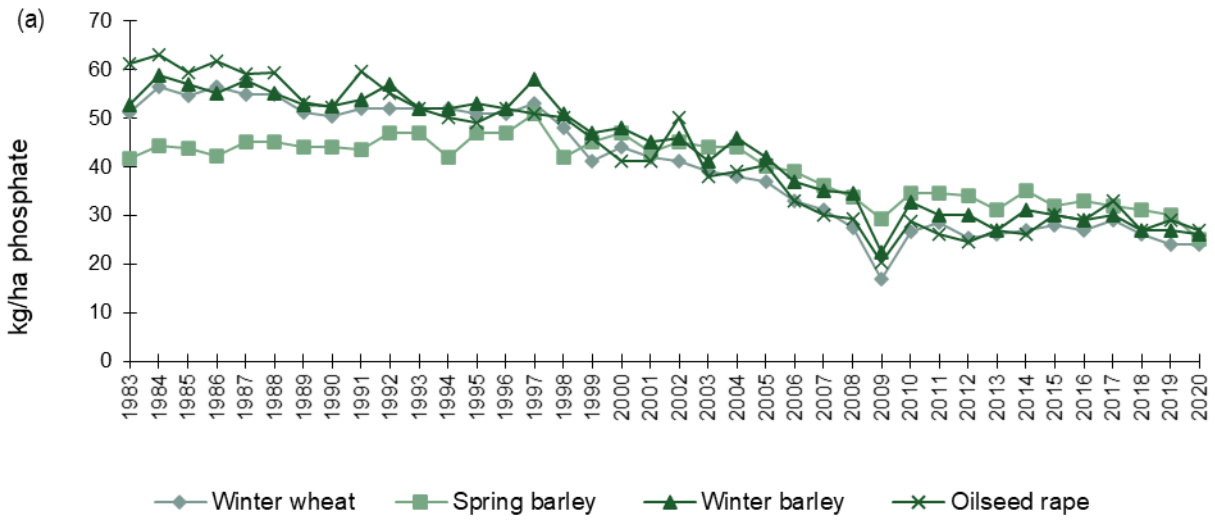
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

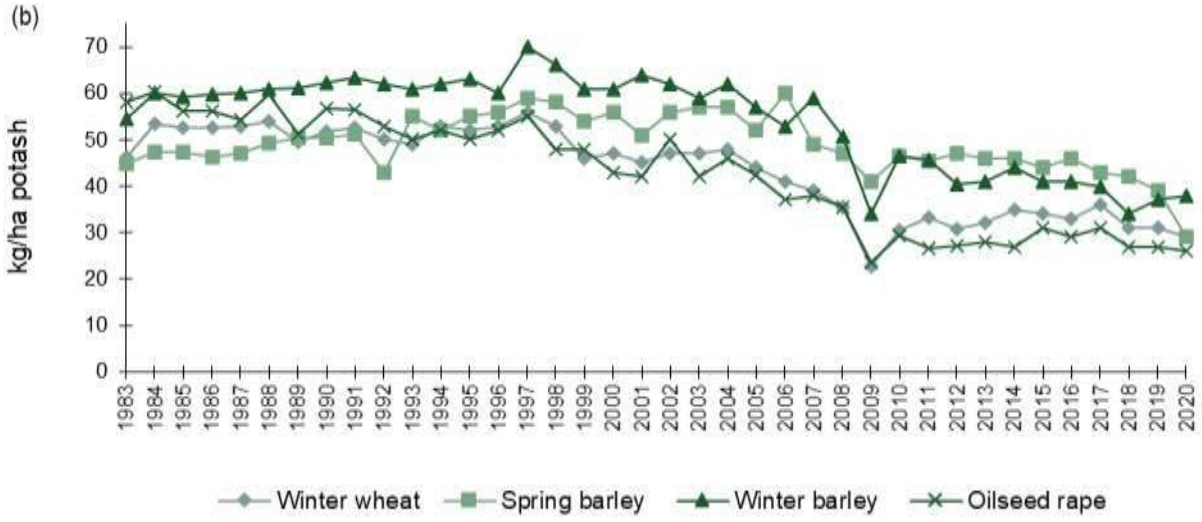
Phosphate use on the main combinable crops has shown a gradual net decline since 1983. (Figure B2.5(a)). The year 2009 saw more marked decreases in overall rates due to a spike in fertiliser prices (-10 kg/ha for winter wheat and -13 kg/ha for winter barley). In 2010 overall phosphate rates recovered and there was a period of relative stability between 2010 and 2017, but since then there appears to have been a resumption in the decline. Overall phosphate use has also declined steadily on potatoes and sugar beet.

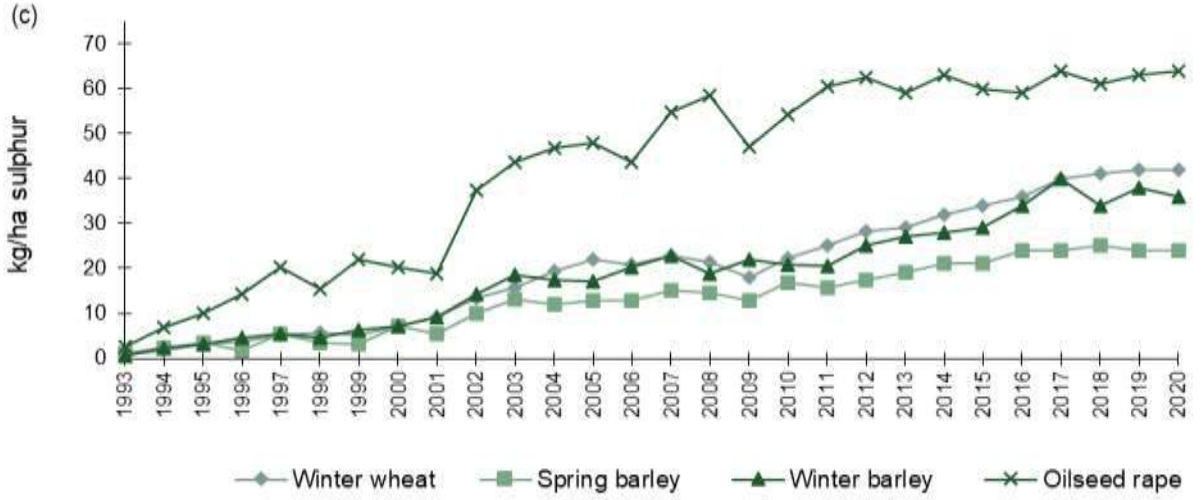
Potash use on the main combinable crops was relatively stable from 1983 to about the turn of the century. It then went through a period of decline to 2009, followed by relative stability between 2010 and 2017, before a return to apparent decline thereafter. However in 2020, the spring barley rate declined significantly, possibly due to the effect of an unusual season in which the weather caused a major shift from winter sown crops to spring barley and a disruption to fertiliser planning (Figure B2.5(b)). Overall potash rates have also declined steadily on potatoes and sugar beet.

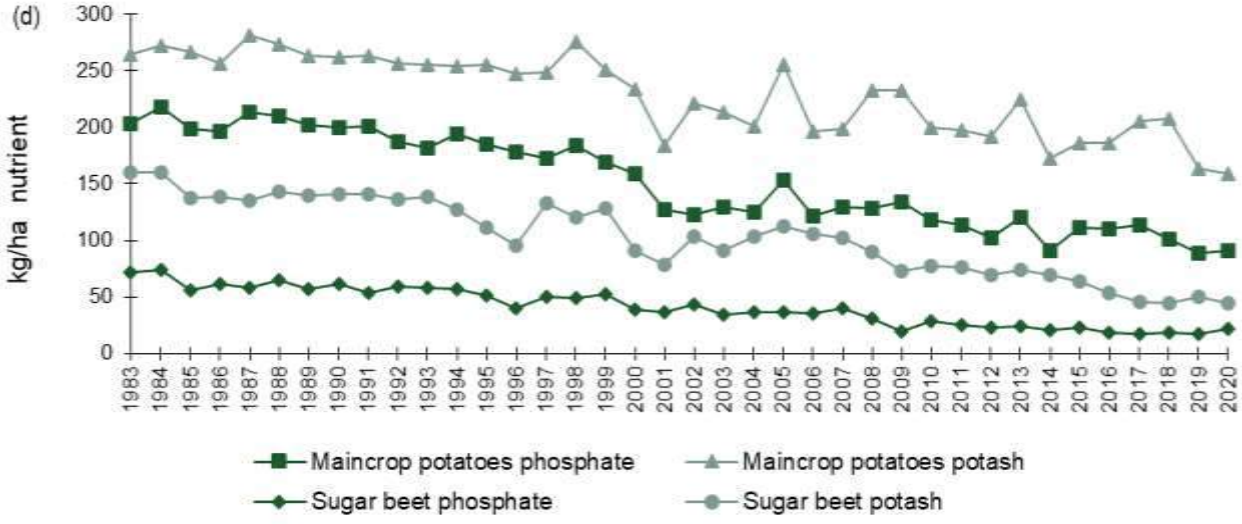
Overall application rates of sulphur (SO_3) on the main combinable crops has increased steadily since reporting of sulphur data began in 1983 (Figure B2.5c). This trend is a reflection of a continuing increase in the dressing cover of sulphur on these and other crops (Table B1.4), rather than increases in the average rates which have been relatively constant and close to the recommended rate for many years (Table B1.3b).

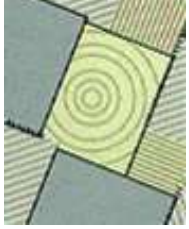
Figure B2.5 Overall application rates (kg/ha) of (a) phosphate, (b) potash, (c) sulphur on major arable crops, and (d) phosphate and potash on sugar beet and potatoes, Great Britain 1983 – 2020




(b)
kg/ha potash
70
60
50
40
30
20
10
0
1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Winter wheat
Spring barley
Winter barley
Oilseed rape


(c)
kg/ha sulphur
70
60
50
40
30
20
10
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Winter wheat
Spring barley
Winter barley
Oilseed rape

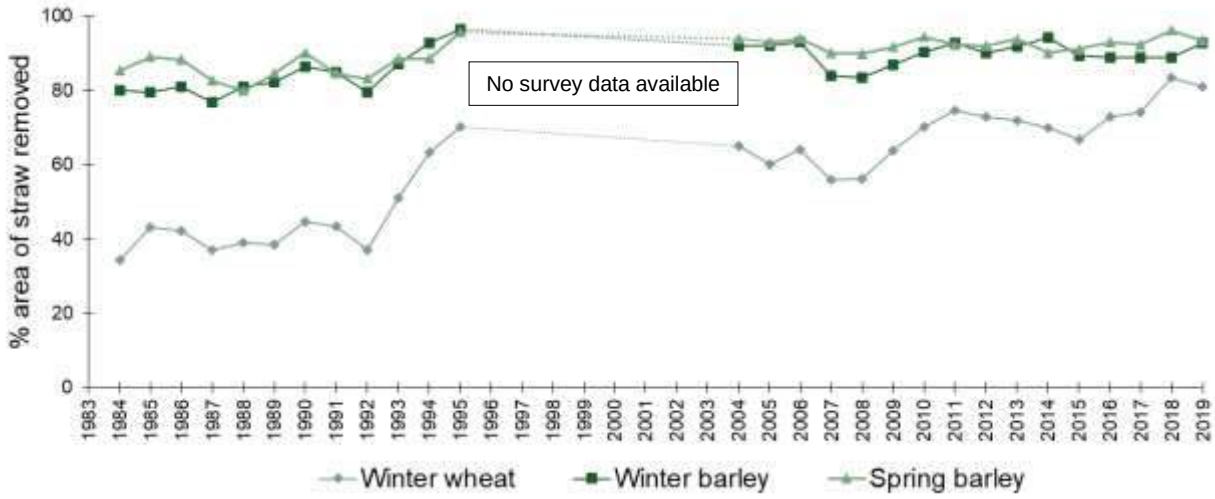

(d)
kg/ha nutrient
300
250
200
150
100
50
0
1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Maincrop potatoes phosphate
Maincrop potatoes potash
Sugar beet phosphate
Sugar beet potash



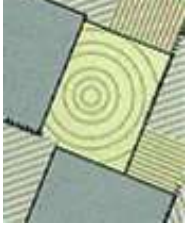
B2.3 STRAW REMOVAL

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 2020 Survey related to the fate of the straw from the 2019 harvest so is reported against 2019. In 2019, 81% of the winter wheat straw was removed from the fields, with the percentages for winter and spring barley much higher at 93% and 94% respectively.

Figure B2.6 Percentage of straw removed from wheat and barley fields, England & Wales harvest years 1984 – 1995, Great Britain harvest years 2004 - 2019



Data for the period 1984-95 were sourced from MAFF/Defra straw disposal surveys, those for the period 2004-19 from this Survey. No data are available for the period 1996-2003. 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.

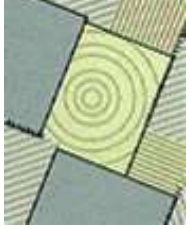


B2.4 TOTAL QUANTITIES OF NITROGEN, PHOSPHATE AND POTASH, UK

Table B2.7 Quantities of major nutrients used, United Kingdom 1966-2020

Harvest year	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
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	1,059	315	69	19	404	322	59	17	398
1977	879	146	68	1,093	316	69	21	406	330	59	20	409
1978	924	156	75	1,155	316	72	22	410	328	64	20	412
1979	941	160	85	1,186	321	73	22	416	333	65	21	419
1980	1,031	156	81	1,268	342	75	24	440	361	65	22	447
1981	1,100	159	76	1,335	344	73	24	441	367	66	21	454
1982	1,180	160	76	1,416	357	65	24	446	394	67	22	483
1983	1,227	161	82	1,470	359	65	24	448	409	68	23	500
1984	1,316	183	89	1,588	391	69	28	488	457	73	29	559
1985	1,298	186	96	1,580	375	71	23	469	441	72	28	541
1986	1,297	176	99	1,572	341	65	28	434	415	66	29	510
1987	1,370	193	111	1,674	340	65	27	432	429	70	29	528
1988	1,251	180	94	1,525	341	70	24	435	419	76	29	524
1989	1,223	193	98	1,514	334	65	26	425	420	74	29	523
1990	1,275	194	113	1,582	323	63	28	414	409	73	33	515
1991	1,224	193	98	1,515	321	61	24	406	393	71	28	492
1992	1,105	166	94	1,365	295	55	21	371	351	64	26	441
1993	968	142	109	1,219	286	50	24	360	344	57	29	430
1994	986	133	129	1,248	312	51	28	391	361	59	38	458
1995	1,064	156	128	1,348	325	53	27	405	378	64	34	476
1996	1,048	157	128	1,333	302	62	30	394	370	65	36	471
1997	1,156	172	112	1,440	325	63	24	412	405	65	31	501
1998	1,111	158	106	1,375	308	56	19	383	397	64	26	487
1999	1,015	152	117	1,284	274	50	23	347	365	59	27	451
2000	1,005	150	113	1,268	237	59	21	317	322	61	26	409
2001	876	180	106	1,162	201	57	21	279	274	69	26	369
2002	915	187	95	1,197	209	55	19	283	297	70	24	391
2003	853	170	108	1,131	203	60	19	282	283	66	26	375
2004	875	150	100	1,125	205	57	16	278	288	65	22	375
2005	834	150	77	1,061	192	55	12	259	267	67	18	352
2006	780	153	70	1,003	173	51	11	235	243	66	16	325
2007	802	126	80	1,008	169	46	9	224	241	59	17	317
2008	800	127	74	1,001	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	1,016	134	44	6	184	182	57	12	251
2011	824	124	74	1,022	145	42	5	192	213	59	11	283
2012	809	125	66	1,000	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	1,060	146	48	7	201	206	65	13	284
2015	819	155	75	1,049	142	48	6	196	196	64	12	272
2016	801	155	71	1,026	139	51	7	197	188	69	13	270
2017	806	157	78	1,041	133	54	8	195	185	77	14	276
2018	804	147	82	1,033	131	48	9	188	174	72	16	262
2019	810	150	79	1,038	132	46	7	186	182	68	14	264
2020e	*757*	*131*	*79*	*967*	*127*	*39*	*8*	*174*	*176*	*63*	*14*	*253*

Note: Years are harvest (e.g. 2020 refers to the 2019/20 cropping year) rather than calendar years. Data for 2020 are estimates.

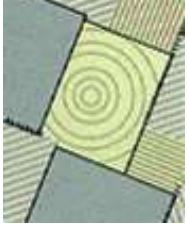


Quantities of nitrogen, phosphate and potash used in the UK since 1966 are shown in Table B2.6. These data are based on BSFP findings and trade and sales data. They are compiled by the AIC in conjunction with Defra using the methodology described in Section A2.5. They are the official figures for fertiliser usage.

Total nitrogen use in the UK increased from 590,000 tonnes in 1966 up to 1,674,000 tonnes in 1987 before declining gradually to 1,001,000 tonnes in 2008. The drop in 2009 was related to high fertiliser prices. Between 2010 and 2019 nitrogen use has remained relatively stable. From the peak in 1987, nitrogen use since has fallen by approximately 40%.

Phosphate use in the UK has fallen since the mid-1980s but since 2007 this decline has slowed. Setting aside the results from the 2020 Survey where an estimated 174,000 tonnes of phosphate was used (see Table A3.1), between 2010 and 2019 total phosphate use had been more stable, between 184,000 – 201,000 tonnes. However, these volumes are still approximately half that compared to use between 1965 and 1985. The low use of 129,000 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 2020 has been between 251,000 – 284,000 tonnes, which is around half that used at its peak. The low use of 208,000 tonnes in 2009 was price related.

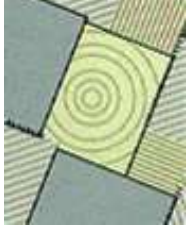


SECTION C – TABLES

CONTENTS

GREAT BRITAIN TABLES 2020

ENGLAND AND WALES TABLES 2020



SCOTLAND TABLES 2020

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 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Spring wheat	96	24	19	66	14	140	46	45	47	134	11	8	31	180
Winter wheat	99	44	46	73	24	179	55	63	57	177	24	29	42	947
Spring barley	98	52	50	54	27	102	47	59	43	99	25	29	24	905
Winter barley	98	52	57	76	25	141	50	67	47	139	26	38	36	388
Oats	87	44	42	45	26	100	42	55	43	87	19	23	19	260
Rye/triticale/Durum wheat	91	26	37	67	26	107	47	45	38	97	12	17	25	30
Potatoes (seed or earlies)	100	83	72	6	22	81	114	163	-	81	94	118	-	11
Potatoes (maincrop)	91	85	91	14	21	130	107	175	-	118	91	159	-	50
Sugar beet	98	52	59	69	36	71	42	75	47	69	22	44	33	83
Spring oilseed rape	100	37	17	85	4	87	50	69	66	87	18	12	56	22
Winter oilseed rape	99	50	44	83	24	172	55	60	78	171	27	26	64	295
Linseed	100	10	6	78	9	75	37	-	42	75	4	-	33	28
Forage maize	87	67	33	27	85	71	53	72	30	62	35	24	8	186
Rootcrops for stockfeed	81	55	60	20	59	65	64	69	37	52	35	42	7	55
Leafy forage crops	71	63	63	33	28	73	42	55	25	52	26	34	8	63
Arable silage/other fodder crops	47	29	34	26	52	121	36	47	48	57	11	16	13	117
Peas - human consumption	0	12	10	6	0	-	85	102	-	-	11	11	-	43
Peas - animal consumption	1	23	22	11	6	-	74	52	-	-	17	11	-	39
Beans - animal consumption	2	23	24	7	4	33	57	63	41	1	13	15	3	186
Vegetables (brassicae)	50	50	50	20	50	106	49	104	-	52	24	52	-	7
Vegetables (other)	74	48	58	26	14	113	36	98	46	83	17	56	12	32
Soft Fruit	89	36	84	48	0	70	59	111	23	63	21	93	11	18
Top Fruit	74	28	47	19	0	70	39	107	-	52	11	50	-	23
Other tillage	48	33	16	24	8	98	65	90	50	47	22	15	12	56
All tillage	89	46	44	59	25	136	52	66	53	121	24	29	31	4024
Grass under 5 years old	79	46	51	31	51	125	30	46	37	98	14	24	12	958
Grass 5 years and over	51	33	34	12	32	87	20	26	30	44	7	9	4	2387
All grass	56	35	37	15	35	96	22	31	33	53	8	11	5	3345
All crops and grass	70	40	40	34	31	118	37	48	48	83	15	19	16	7369

[1] The term FYM in this table denotes all organic manures

Source: British Survey of Fertiliser Practice 2020

NB: 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 GB1.2 Use of straight fertiliser, Great Britain 2020

	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	94	8	6	136	58	71	129	5	4	180
Winter wheat	98	15	18	176	58	68	172	9	12	947
Spring barley	85	8	8	94	52	62	80	4	5	905
Winter barley	95	14	20	137	51	76	131	7	15	388
Oats	79	11	11	95	42	65	75	5	7	260
Rye/triticale/Durum wheat	87	9	23	109	-	20	95	-	5	30
Potatoes (seed or earlies)	21	0	22	-	-	-	-	-	-	11
Potatoes (maincrop)	29	3	20	94	-	194	27	-	38	50
Sugar beet	88	2	22	66	-	94	58	-	21	83
Spring oilseed rape	100	25	17	85	48	69	85	12	12	22
Winter oilseed rape	99	11	18	163	52	64	161	6	12	295
Linseed	98	1	1	73	-	-	72	-	-	28
Forage maize	54	9	14	81	61	98	44	5	14	186
Rootcrops for stockfeed	32	1	1	69	-	-	22	-	-	55
Leafy forage crops	28	5	4	50	-	-	14	-	-	63
Arable silage/other fodder crops	32	1	6	122	-	74	39	-	4	117
Peas - human consumption	0	11	9	-	91	111	-	10	10	43
Peas - animal consumption	1	12	10	-	-	-	-	-	-	39
Beans - animal consumption	2	11	12	-	66	64	-	7	8	186
Vegetables (brassicae)	37	0	0	-	-	-	-	-	-	7
Vegetables (other)	49	0	15	144	-	-	71	-	-	32
Soft Fruit	64	5	48	70	-	79	44	-	38	18
Top Fruit	61	8	28	75	-	108	46	-	30	23
Other tillage	46	7	6	93	-	-	43	-	-	56
All tillage	82	11	14	134	57	73	110	6	10	4024
Grass under 5 years old	47	2	4	127	68	93	59	1	4	958
Grass 5 years and over	23	0	1	100	72	100	23	0	1	2387
All grass	27	1	1	108	70	96	29	0	1	3345
All crops and grass	51	5	7	126	58	76	65	3	5	7369

Source: British Survey of Fertiliser Practice 2020

Table GB1.3 Use of compound fertiliser, Great Britain 2020

	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	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Spring wheat	13	16	13	2	39	39	34	28	5	6	4	1	180
Winter wheat	11	30	29	5	45	52	58	40	5	16	17	2	947
Spring barley	36	44	42	16	53	46	59	33	19	20	25	5	905
Winter barley	19	38	37	9	43	49	63	34	8	19	23	3	388
Oats	26	33	31	11	43	42	51	31	11	14	16	3	260
Rye/triticale/Durum wheat	4	17	17	2	-	52	70	-	-	9	12	-	30
Potatoes (seed or earlies)	83	83	58	3	87	114	143	-	72	94	83	-	11
Potatoes (maincrop)	86	83	83	5	105	102	145	-	91	84	121	-	50
Sugar beet	37	50	40	25	30	40	59	42	11	20	24	10	83
Spring oilseed rape	12	12	0	0	-	-	-	-	-	-	-	-	22
Winter oilseed rape	28	40	26	6	35	55	56	55	10	22	14	3	295
Linseed	12	9	5	3	31	-	-	-	4	-	-	-	28
Forage maize	60	60	19	10	30	50	53	18	18	30	10	2	186
Rootcrops for stockfeed	53	54	60	12	56	64	66	38	30	35	40	5	55
Leafy forage crops	57	58	60	28	66	42	51	26	38	25	30	7	63
Arable silage/other fodder crops	27	29	32	6	64	33	37	16	17	10	12	1	117
Peas - human consumption	0	1	1	0	-	-	-	-	-	-	-	-	43
Peas - animal consumption	0	12	12	0	-	69	59	-	-	8	7	-	39
Beans - animal consumption	1	13	12	2	-	50	59	22	-	6	7	0	186
Vegetables (brassicae)	50	50	50	0	53	49	104	-	26	24	52	-	7
Vegetables (other)	33	48	42	4	37	36	53	-	12	17	22	-	32
Soft Fruit	30	36	36	25	60	52	153	-	18	19	54	-	18
Top Fruit	14	19	19	14	-	-	-	-	-	-	-	-	23
Other tillage	19	26	10	4	-	54	48	-	-	14	5	-	56
All tillage	24	35	31	9	48	50	61	34	11	18	19	3	4024
Grass under 5 years old	47	45	49	17	83	28	41	27	39	13	20	5	958
Grass 5 years and over	34	33	34	8	62	19	24	22	21	6	8	2	2387
All grass	36	35	36	9	67	21	28	23	24	7	10	2	3345
All crops and grass	31	35	34	9	60	34	41	28	18	12	14	3	7369

Source: British Survey of Fertiliser Practice 2020

Table GB1.4 Use of lime, Great Britain 2020

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	7.6	-	-	1.2	0.1	8.9	3.3	-	-	8.2	0.4	3.9	8	180
Winter wheat	2.6	0.6	0.3	0.3	0.3	4.1	4.6	5.1	3.7	10.0	4.8	5.0	50	947
Spring barley	5.5	0.6	0.9	0.1	1.3	8.4	5.1	3.7	4.6	3.8	1.4	4.3	78	905
Winter barley	5.3	0.6	-	-	0.4	6.3	4.4	4.7	-	-	0.4	4.2	27	388
Oats	2.4	-	-	0.7	0.7	3.9	4.7	-	-	10.0	3.5	5.4	12	260
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	30
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	11
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	50
Sugar beet	17.3	3.7	-	11.7	0.8	33.5	4.7	5.0	-	6.3	0.3	5.2	24	83
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	2	22
Winter oilseed rape	5.3	0.5	0.4	0.7	0.3	7.1	4.6	4.5	3.4	5.0	0.3	4.4	24	295
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	28
Forage maize	5.0	0.3	1.8	-	-	7.1	3.9	5.4	3.5	-	-	3.8	19	186
Rootcrops for stockfeed	32.5	-	4.2	-	7.5	44.1	4.3	-	5.0	-	4.4	4.4	19	55
Leafy forage crops	12.5	-	2.0	-	7.4	21.9	2.9	-	2.2	-	5.0	3.6	14	63
Arable silage/other fodder crops	10.8	0.3	-	-	0.4	11.5	4.7	5.0	-	-	0.4	4.5	15	117
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	43
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	39
Beans - animal consumption	1.7	0.9	0.3	0.3	-	3.2	5.0	5.0	2.5	5.0	-	4.8	6	186
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	1	7
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	3	32
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	18
Top Fruit	16.9	3.2	-	-	-	20.1	3.9	1.3	-	-	-	3.5	5	23
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	2	56
All tillage	4.7	0.6	0.4	0.5	0.7	7.0	4.5	4.2	4.1	6.9	2.1	4.4	316	4024
Grass under 5 years old	5.5	0.1	0.8	-	0.6	6.9	4.4	5.0	4.0	-	4.2	4.3	100	958
Grass 5 years and over	1.7	-	0.2	0.0	0.3	2.2	4.5	-	4.5	3.8	0.8	4.0	105	2387
All grass	2.3	0.0	0.3	0.0	0.4	3.0	4.4	5.0	4.3	3.8	1.7	4.1	205	3345
All crops and grass	3.4	0.3	0.3	0.2	0.5	4.7	4.5	4.2	4.2	6.9	1.9	4.3	521	7369

Source: British Survey of Fertiliser Practice 2020

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Grazed not mown	44	30	30	10	19	74	18	20	26	33	5	6	3	1594
Grazed mown	75	47	51	24	63	111	26	40	37	83	12	20	9	1487
All grazings	55	36	37	15	34	91	21	29	32	50	8	11	5	3081
Cut for silage - grazed	82	51	56	27	70	117	27	42	38	96	14	23	10	1111
Cut for silage - not grazed	80	32	41	23	74	165	36	58	38	132	12	24	9	183
All cut for silage	82	48	54	27	70	124	28	43	38	102	13	23	10	1294
Cut for hay - grazed	52	36	37	15	41	72	23	27	27	38	8	10	4	401
Cut for hay - not grazed	47	16	19	2	16	99	19	23	52	47	3	4	1	60
All cut for hay	52	34	35	14	38	75	22	26	28	39	8	9	4	461
All mowings	75	45	49	24	63	117	27	41	37	88	12	20	9	1727
All grass	56	35	37	15	35	96	22	31	33	53	8	11	5	3345

[1] The term FYM in this table denotes all organic manures

Source: British Survey of Fertiliser Practice 2020

Table GB3.0 Product use by month of application, Great Britain 2020

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	3	28	41	17	6	3	1
Straight P	14	6	16	0	0	4	31	22	6	0	0	0
Straight K	2	5	11	1	0	6	41	25	7	1	0	1
Compounds	5	3	1	0	0	1	21	37	15	8	4	3
All fertilisers	2	1	1	0	0	2	26	39	16	6	3	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	2	26	41	18	7	3	2
Phosphate	9	5	6	0	0	3	26	32	10	3	2	3
Potash	6	4	6	0	0	3	28	32	10	5	3	2
Sulphur	0	0	0	0	0	4	44	35	10	3	1	0
Total	2	1	2	0	0	3	28	38	15	6	3	2

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

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2020.

'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 2020

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2020

column %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not specified	all grass	all crops and grass
Ammonium Nitrate	41.5	45.8	7.2	20.0	43.6	20.8	40.2	30.3	29.7	31.4	16.1	31.5	37.7
Urea	5.2	7.8	0.0	2.5	9.5	3.7	6.5	3.7	3.2	4.0	1.8	3.8	5.7
Calcium Ammonium Nitrate (CAN)	2.6	2.8	0.0	3.3	3.1	2.4	2.7	2.9	0.8	3.0	0.0	2.6	2.6
Urea Ammonium Nitrate (UAN)	13.0	18.4	2.4	7.1	19.2	7.2	15.2	2.7	4.7	2.8	32.2	3.0	11.6
Other Straight N	1.2	1.1	2.2	1.1	2.7	1.5	1.4	1.1	1.0	2.2	0.0	1.6	1.5
Triple Superphosphate (TSP)	2.8	3.3	2.3	0.9	2.5	4.8	3.1	0.8	0.5	0.5	1.7	0.9	2.4
Other Straight P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muriate of Potash (MOP)	2.4	3.5	5.9	1.0	2.7	6.4	3.4	1.0	1.4	1.2	7.0	1.2	2.7
Other Straight K	0.6	0.4	5.1	21.4	0.8	1.2	1.3	0.3	1.0	0.2	3.1	0.3	1.0
PK	6.4	9.3	1.8	21.1	5.5	13.3	8.5	2.7	2.4	2.8	3.4	2.6	6.8
NK	0.7	0.8	4.9	0.0	0.8	3.5	1.1	4.2	3.5	6.1	0.0	4.6	2.1
Low N (<19% N)	12.8	3.3	67.0	11.5	7.8	24.2	10.5	4.6	3.9	4.4	18.3	4.5	8.7
High N (>=19% N)	10.7	3.5	1.0	6.8	1.3	9.9	5.8	45.5	47.9	41.3	13.6	43.5	16.9
Other	0.1	0.1	0.0	3.3	0.5	1.1	0.3	0.1	0.0	0.0	2.9	0.1	0.2
Total product ('000 tonnes)	**657**	**1130**	**50**	**50**	**254**	**147**	**2288**	**1027**	**78**	**653**	**8**	**1163**	**3451**

Source: British Survey of Fertiliser Practice 2020

Table GB3.2 Use of product type by crop group, Great Britain 2020

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	27.7	54.5	0.3	1.1	11.8	4.5	70.4	83.7	6.0	60.5	0.3	29.6	1307
Urea	26.2	56.0	0.0	1.0	14.6	2.1	79.2	86.1	4.3	59.8	0.6	20.8	205
Calcium Ammonium Nitrate (CAN)	35.8	43.7	0.0	3.7	9.9	7.0	67.8	98.3	1.4	72.6	0.0	32.2	101
Urea Ammonium Nitrate (UAN)	24.0	59.4	0.2	1.1	12.4	2.8	93.4	82.6	13.4	45.9	13.9	6.6	469
Other Straight N	25.6	40.4	3.2	1.6	21.8	7.5	59.0	51.9	2.0	66.0	0.0	41.0	47
Triple Superphosphate (TSP)	26.2	49.8	1.2	0.6	8.8	13.3	92.0	64.4	1.8	64.9	2.0	8.0	68
Other Straight P	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash (MOP)	16.8	50.1	4.1	1.1	10.1	17.8	87.3	68.1	2.5	73.8	6.0	12.7	77
Other Straight K	9.8	32.3	4.9	30.2	14.4	8.5	88.9	78.7	14.9	59.6	18.2	11.1	29
PK	21.6	57.1	0.3	4.9	7.0	9.2	88.5	97.4	19.0	63.9	0.3	11.5	199
NK	31.9	20.8	8.4	0.0	11.0	27.8	24.1	80.4	3.2	81.5	0.0	75.9	74
Low N (<19% N)	40.9	16.2	16.7	4.1	9.3	12.8	87.3	90.6	7.7	62.6	2.1	12.7	257
High N (>=19% N)	61.3	23.9	0.4	2.0	2.4	9.9	14.8	94.0	7.3	47.8	0.0	85.2	610
Other	10.4	15.4	0.0	36.7	10.9	26.7	90.2	100.0	0.0	86.7	13.3	9.8	7
All Fertilisers	**28.7**	**49.4**	**2.2**	**2.2**	**11.1**	**6.4**	**66.3**	**88.3**	**6.7**	**56.1**	**0.7**	**33.7**	**3451**

Source: British Survey of Fertiliser Practice 2020

Table GB3.3 Product use by month of application, Great Britain 2020

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.2	2.2	26.1	40.2	18.7	6.8	3.4	1.9	0.2	0.0	0.2	0.0	1307
Urea	0.1	4.3	36.2	39.6	13.0	3.7	1.5	0.2	0.2	0.1	1.0	0.0	205
Calcium Ammonium Nitrate (CAN)	0.0	2.1	26.2	39.8	22.2	3.4	3.6	1.8	0.9	0.1	0.0	0.0	101
Urea Ammonium Nitrate (UAN)	0.2	3.5	31.8	43.9	15.2	3.6	1.4	0.2	0.2	0.0	0.0	0.0	469
Other Straight N	0.0	2.3	26.5	44.7	13.9	6.8	1.9	2.8	1.2	0.0	0.0	0.0	47
Triple Superphosphate (TSP)	0.0	4.3	31.4	22.3	5.3	0.3	0.1	0.4	14.4	5.8	15.6	0.0	68
Other Straight P	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash (MOP)	0.0	5.3	35.0	27.2	7.8	1.0	0.3	1.1	3.2	3.9	14.9	0.3	77
Other Straight K	0.0	9.4	58.7	17.8	4.0	0.0	0.0	0.0	0.0	6.5	1.7	1.9	29
PK	0.3	1.4	23.6	17.9	5.3	1.9	1.5	5.2	19.6	14.0	7.5	1.2	199
NK	0.0	1.0	12.1	21.1	18.6	31.0	13.5	2.5	0.1	0.0	0.0	0.0	74
Low N (<19% N)	0.2	3.8	33.9	41.6	6.5	1.7	0.8	3.8	6.9	0.4	0.6	0.0	257
High N (>=19% N)	0.0	0.5	16.3	43.1	20.9	9.9	5.9	2.4	0.7	0.4	0.1	0.0	610
Other	0.0	3.0	38.4	25.4	8.4	0.0	0.0	0.0	0.0	10.7	14.1	0.0	7
All Fertilisers	**0.2**	**2.4**	**26.5**	**38.8**	**16.0**	**6.1**	**3.2**	**1.9**	**2.3**	**1.2**	**1.3**	**0.1**	**3451**

Source: British Survey of Fertiliser Practice 2020

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2020

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	99	25	19	8	145	46	44	144	12	8	124
Winter wheat	100	44	44	23	183	54	63	183	24	28	480
Spring barley	100	42	38	20	105	47	57	105	20	22	350
Winter barley	100	49	55	14	143	50	71	143	24	39	162
Oats	94	48	43	19	98	43	55	92	20	23	110
Rye/triticale/Durum wheat	97	14	54	14	82	-	-	80	-	-	6
Potatoes (seed or earlies)	100	100	100	0	61	120	188	61	120	188	5
Potatoes (maincrop)	100	100	92	0	106	110	143	106	110	132	6
Sugar beet	100	56	60	21	67	44	72	67	24	43	24
Spring oilseed rape	100	28	8	6	99	54	-	99	15	-	16
Winter oilseed rape	99	56	44	19	173	54	63	171	30	27	176
Linseed	100	7	6	8	74	-	-	74	-	-	20
Forage maize	74	49	30	58	102	74	99	76	36	30	27
Rootcrops for stockfeed	68	54	54	46	76	-	-	52	-	-	6
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	44	21	31	49	167	42	62	74	9	19	20
Peas - human consumption	0	11	4	0	-	-	-	-	-	-	19
Peas - animal consumption	2	25	17	9	-	74	-	-	18	-	22
Beans - animal consumption	1	22	22	3	-	59	61	-	13	13	125
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	1
Vegetables (other)	73	29	43	0	171	-	-	125	-	-	10
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	81	54	18	2	114	68	123	92	37	22	24
All tillage	90	42	39	19	145	52	63	131	22	24	1736
Grass under 5 years old	67	20	34	12	131	46	62	88	9	21	96
Grass 5 years and over	35	13	13	8	95	31	46	34	4	6	260
All grass	42	15	17	9	107	35	53	45	5	9	356
All crops and grass	83	38	35	17	142	51	63	118	19	22	2092

[1] The term FYM in this table denotes all organic manures.

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

Source: British Survey of Fertiliser Practice 2020

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2020

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	80	14	17	26	124	46	55	100	7	9	34
Winter wheat	97	42	48	14	169	56	62	165	23	30	224
Spring barley	99	58	55	13	104	47	69	103	28	38	172
Winter barley	100	51	59	19	132	53	65	132	27	39	75
Oats	94	36	33	27	110	45	54	104	16	18	41
Rye/triticale/Durum wheat	100	23	23	0	112	-	-	112	-	-	9
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	92	84	92	17	128	104	175	118	87	160	33
Sugar beet	96	52	60	40	71	40	74	69	21	44	51
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	4
Winter oilseed rape	100	34	41	25	168	50	51	168	17	21	70
Linseed	-	-	-	-	-	-	-	-	-	-	2
Forage maize	92	48	36	61	53	43	75	49	21	27	25
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	81	31	31	5	-	-	-	-	-	-	5
Arable silage/other fodder crops	17	18	18	7	-	-	-	-	-	-	9
Peas - human consumption	0	12	15	0	-	-	-	-	-	-	19
Peas - animal consumption	0	18	31	0	-	-	-	-	-	-	13
Beans - animal consumption	6	19	24	3	-	49	69	-	9	17	31
Vegetables (brassicae)	46	46	46	54	-	-	-	-	-	-	5
Vegetables (other)	72	61	68	20	67	28	51	48	17	35	19
Soft Fruit	89	36	84	0	70	59	111	63	21	93	18
Top Fruit	74	27	48	0	66	39	107	49	11	51	19
Other tillage	27	14	14	9	34	41	72	9	6	10	18
All tillage	88	44	48	17	127	54	76	112	24	37	904
Grass under 5 years old	63	30	31	34	141	35	57	89	11	18	90
Grass 5 years and over	44	20	21	25	111	29	44	49	6	9	201
All grass	48	22	23	26	118	31	47	57	7	11	291
All crops and grass	76	38	41	20	125	50	71	96	19	29	1195

[1] The term FYM in this table denotes all organic manures.

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 2020

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2020

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	72	9	9	100	137	-	-	99	-	-	6
Winter wheat	97	26	32	50	151	32	38	147	8	12	41
Spring barley	78	56	58	64	83	32	39	65	18	23	51
Winter barley	64	27	30	73	166	29	65	106	8	19	15
Oats	56	6	6	72	97	-	-	54	-	-	9
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	1
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	91	76	31	98	71	57	80	64	44	25	69
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	54	44	44	19	-	-	-	-	-	-	6
Arable silage/other fodder crops	34	12	13	77	95	-	-	32	-	-	35
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	0
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	79	47	33	76	101	46	54	80	22	18	244
Grass under 5 years old	88	34	44	83	165	26	49	145	9	21	185
Grass 5 years and over	79	34	37	68	147	24	37	117	8	14	303
All grass	82	34	39	73	153	25	42	126	8	16	488
All crops and grass	82	36	38	73	144	30	43	118	11	16	732

[1] The term FYM in this table denotes all organic manures.

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

Source: British Survey of Fertiliser Practice 2020

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2020

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	100	100	66	65	131	41	-	131	41	-	5
Winter wheat	100	87	86	36	185	61	68	185	53	59	38
Spring barley	97	79	80	65	82	41	48	79	32	38	140
Winter barley	96	70	70	65	138	41	58	133	29	41	56
Oats	73	63	63	71	78	26	31	56	17	20	36
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	92	71	26	100	51	42	65	47	30	17	38
Rootcrops for stockfeed	80	64	64	54	62	54	56	49	35	36	29
Leafy forage crops	78	79	75	40	79	40	49	62	32	37	38
Arable silage/other fodder crops	69	65	75	48	72	38	50	49	25	38	29
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	0
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	6	49	49	55	-	-	-	-	-	-	6
All tillage	89	75	70	63	100	44	52	88	33	36	424
Grass under 5 years old	81	65	67	50	95	27	38	77	18	26	405
Grass 5 years and over	49	37	38	31	69	18	22	34	7	9	1353
All grass	53	40	41	33	73	20	25	38	8	10	1758
All crops and grass	55	42	43	35	76	22	28	41	9	12	2182

[1] The term FYM in this table denotes all organic manures.

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 2020

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2020

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	96	12	15	48	102	-	-	99	-	-	10
Winter wheat	98	53	55	42	182	57	70	179	30	38	147
Spring barley	95	63	66	40	97	54	63	92	34	42	178
Winter barley	99	59	61	40	152	54	69	150	32	42	73
Oats	74	43	47	20	102	47	68	75	20	32	62
Rye/triticale/Durum wheat	55	23	23	100	-	-	-	-	-	-	6
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	2
Potatoes (maincrop)	69	69	79	82	177	146	240	123	101	190	9
Sugar beet	100	48	69	72	90	-	-	90	-	-	6
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	55	47	44	172	64	66	172	35	31	42
Linseed	100	14	14	0	70	-	-	70	-	-	5
Forage maize	85	81	48	95	81	38	35	69	30	17	25
Rootcrops for stockfeed	84	38	57	85	74	85	63	62	32	36	12
Leafy forage crops	60	51	51	24	90	66	71	54	33	36	12
Arable silage/other fodder crops	61	44	44	48	117	36	39	71	16	17	23
Peas - human consumption	0	35	35	0	-	-	-	-	-	-	5
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	1	52	57	6	-	57	63	-	30	36	25
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	1
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	3
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	3
Other tillage	11	0	0	0	-	-	-	-	-	-	6
All tillage	88	55	56	40	131	55	66	116	30	37	659
Grass under 5 years old	73	46	50	35	112	39	57	82	18	28	178
Grass 5 years and over	48	32	31	16	70	20	25	34	6	8	260
All grass	54	36	36	21	84	26	36	46	9	13	438
All crops and grass	70	45	45	30	111	42	53	78	19	24	1097

[1] The term FYM in this table denotes all organic manures.

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

Source: British Survey of Fertiliser Practice 2020

Table EW1.1 Total fertiliser use, England & Wales 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Spring wheat	96	23	17	68	13	142	48	48	47	137	11	8	32	173
Winter wheat	99	41	43	73	25	180	56	63	57	178	23	27	41	883
Spring barley	98	40	37	53	23	104	46	54	45	101	18	20	24	722
Winter barley	98	46	52	75	23	139	50	67	47	137	23	35	35	339
Oats	88	36	34	46	24	102	44	58	43	90	16	20	20	208
Rye/triticale/Durum wheat	90	21	33	64	27	106	44	37	38	96	9	12	25	29
Potatoes (seed or earlies)	100	62	62	13	0	95	117	221	-	95	72	137	-	6
Potatoes (maincrop)	90	84	91	14	24	132	107	164	-	119	89	150	-	47
Sugar beet	98	52	60	69	36	70	42	75	47	69	22	45	33	82
Spring oilseed rape	100	41	19	84	4	88	50	69	68	88	20	13	57	21
Winter oilseed rape	99	46	40	83	25	174	54	60	78	172	25	24	65	271
Linseed	100	10	6	78	9	75	37	-	42	75	4	-	33	28
Forage maize	87	67	33	27	85	71	53	72	30	62	35	24	8	186
Rootcrops for stockfeed	78	48	55	17	63	66	57	67	36	52	27	37	6	43
Leafy forage crops	61	40	49	24	23	57	34	48	22	35	13	24	5	33
Arable silage/other fodder crops	41	20	26	24	54	122	45	45	54	50	9	12	13	103
Vining peas (for human consumption)	0	13	11	7	0	-	91	111	-	-	12	12	-	38
Field peas (harvested dry)	1	23	22	11	6	-	74	52	-	-	17	11	-	39
Field beans (harvested dry)	2	23	24	7	4	33	57	63	41	1	13	15	3	182
Vegetables (brassicae)	50	50	50	20	50	106	49	104	-	52	24	52	-	7
Vegetable Other	72	49	59	24	15	117	34	94	39	84	17	56	9	30
Soft Fruit	89	36	84	48	0	70	59	111	23	63	21	93	11	18
Top Fruit	74	28	47	19	0	70	39	107	-	52	11	50	-	23
Other tillage	52	36	17	26	9	98	65	90		51	23	16	13	52
All tillage	89	40	39	58	24	138	53	65	53	123	21	25	31	3563
Grass less than five years old	78	38	44	29	55	131	31	47	38	102	12	21	11	721
Grass five years and over	49	29	31	11	33	89	20	26	32	44	6	8	4	2020
All grass	54	31	33	14	37	98	22	30	34	53	7	10	5	2741
All crops and grass	70	35	35	34	31	122	38	48	49	85	13	17	17	6304

[1] The term FYM in this table denotes all organic manures.

Source: British Survey of Fertiliser Practice 2020

NB: 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 EW1.2 Use of straight fertiliser, England & Wales 2020

	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	95	8	6	139	58	71	132	5	4	173
Winter wheat	98	16	19	178	58	67	174	9	13	883
Spring barley	91	11	10	100	53	62	91	6	6	722
Winter barley	95	16	23	137	51	76	130	8	17	339
Oats	84	11	11	99	40	71	83	5	8	208
Rye/triticale/Durum wheat	86	9	25	109	-	20	94	-	5	29
Potatoes (seed or earlies)	46	0	16	-	-	-	-	-	-	6
Potatoes (maincrop)	31	4	16	94	-	198	29	-	31	47
Sugar beet	88	2	22	66	-	94	58	-	21	82
Spring oilseed rape	100	28	19	86	48	69	86	13	13	21
Winter oilseed rape	98	12	19	167	52	64	164	6	12	271
Linseed	98	1	1	73	-	-	72	-	-	28
Forage maize	54	9	14	81	61	98	44	5	14	186
Rootcrops for stockfeed	37	1	1	70	-	-	26	-	-	43
Leafy forage crops	22	0	7	45	-	-	10	-	-	33
Arable silage/other fodder crops	31	2	3	125	-	67	39	-	2	103
Peas - human consumption	0	13	11	-	91	111	-	12	12	38
Peas - animal consumption	1	12	10	-	-	-	-	-	-	39
Beans - animal consumption	2	11	12	-	66	64	-	7	8	182
Vegetables (brassicae)	37	0	0	-	-	-	-	-	-	7
Vegetables (other)	48	0	16	150	-	-	72	-	-	30
Soft Fruit	64	5	48	70	-	79	44	-	38	18
Top Fruit	61	8	28	75	-	108	46	-	30	23
Other tillage	49	8	7	93	-	-	46	-	-	52
All tillage	83	12	15	138	57	73	115	7	11	3563
Grass under 5 years old	51	2	4	134	69	78	68	1	3	721
Grass 5 years and over	25	0	1	104	74	87	26	0	0	2020
All grass	29	1	1	112	72	81	32	0	1	2741
All crops and grass	54	6	8	131	58	73	71	3	6	6304

Source: British Survey of Fertiliser Practice 2020

Table EW1.3 Use of compound fertiliser, England & Wales 2020

	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	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Spring wheat	11	14	11	2	42	42	35	28	5	6	4	1	173
Winter wheat	8	26	24	3	49	54	58	35	4	14	14	1	883
Spring barley	19	29	26	6	53	44	51	32	10	13	13	2	722
Winter barley	13	31	29	5	51	49	60	27	6	15	17	1	339
Oats	16	25	23	6	42	46	52	25	7	11	12	2	208
Rye/triticale/Durum wheat	4	12	12	2	-	-	-	-	-	-	-	-	29
Potatoes (seed or earlies)	62	62	62	6	120	117	189	-	75	72	117	-	6
Potatoes (maincrop)	85	81	83	6	106	100	143	-	90	81	119	-	47
Sugar beet	37	50	40	25	30	40	59	42	11	20	24	10	82
Spring oilseed rape	13	13	0	0	-	-	-	-	-	-	-	-	21
Winter oilseed rape	23	35	21	4	34	55	54	35	8	19	11	2	271
Linseed	12	9	5	3	31	-	-	-	4	-	-	-	28
Forage maize	60	60	19	10	30	50	53	18	18	30	10	2	186
Rootcrops for stockfeed	47	47	55	11	55	57	64	-	26	27	35	-	43
Leafy forage crops	42	40	43	20	60	34	36	25	25	13	16	5	33
Arable silage/other fodder crops	17	19	22	1	68	40	42	-	11	7	9	-	103
Peas - human consumption	0	0	0	0	-	-	-	-	-	-	-	-	38
Peas - animal consumption	0	12	12	0	-	69	59	-	-	8	7	-	39
Beans - animal consumption	1	13	12	2	-	50	59	-	-	6	7	-	182
Vegetables (brassicae)	50	50	50	0	53	49	104	-	26	24	52	-	7
Vegetables (other)	34	49	43	4	36	34	47	-	12	17	20	-	30
Soft Fruit	30	36	36	25	60	52	153	-	18	19	54	-	18
Top Fruit	14	19	19	14	-	-	-	-	-	-	-	-	23
Other tillage	20	28	11	4	-	54	48	-	-	15	5	-	52
All tillage	17	29	24	5	47	51	59	31	8	14	14	2	3563
Grass under 5 years old	39	36	41	14	87	29	43	29	33	10	18	4	721
Grass 5 years and over	30	29	30	6	60	19	24	21	18	6	7	1	2020
All grass	32	30	32	7	65	21	28	23	21	6	9	2	2741
All crops and grass	25	29	28	6	59	34	40	26	15	10	11	2	6304

Source: British Survey of Fertiliser Practice 2020

Table EW1.4 Use of lime, England & Wales 2020

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	7.9	-	-	1.2	0.1	9.3	3.3	-	-	8.2	0.4	3.9	8	173
Winter wheat	2.7	0.6	0.2	0.3	0.1	3.9	4.6	5.1	3.3	10.0	4.5	5.0	43	883
Spring barley	6.1	0.8	0.4	0.2	0.5	8.0	5.1	3.6	3.9	3.8	1.8	4.6	50	722
Winter barley	5.6	0.4	-	-	0.0	6.0	4.4	4.5	-	-	1.5	4.4	22	339
Oats	1.9	-	-	0.9	-	2.8	4.5	-	-	10.0	-	6.2	6	208
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	29
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	6
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	47
Sugar beet	17.5	3.7	-	11.8	-	33.0	4.7	5.0	-	6.3	-	5.3	23	82
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	2	21
Winter oilseed rape	4.7	0.5	0.4	0.8	0.3	6.7	4.7	4.5	3.4	5.0	0.3	4.5	20	271
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	28
Forage maize	5.0	0.3	1.8	-	-	7.1	3.9	5.4	3.5	-	-	3.8	19	186
Rootcrops for stockfeed	31.9	-	5.1	-	7.5	44.5	4.2	-	5.0	-	4.3	4.3	15	43
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	3	33
Arable silage/other fodder crops	5.4	0.4	-	-	0.5	6.3	4.2	5.0	-	-	0.4	3.9	12	103
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	38
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	39
Beans - animal consumption	1.8	0.9	0.3	0.3	-	3.3	5.0	5.0	2.5	5.0	-	4.8	6	182
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	1	7
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	-	-	2	30
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	18
Top Fruit	16.9	3.2	-	-	-	20.1	3.9	1.3	-	-	-	3.5	5	23
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	2	52
All tillage	4.6	0.7	0.3	0.6	0.3	6.5	4.5	4.2	3.6	6.9	1.8	4.6	245	3563
Grass under 5 years old	4.3	0.1	0.5	-	0.6	5.5	4.3	5.0	3.2	-	4.4	4.2	62	721
Grass 5 years and over	1.5	-	0.2	0.0	0.4	2.1	4.4	-	4.5	3.8	0.5	3.7	75	2020
All grass	1.9	0.0	0.3	0.0	0.4	2.6	4.4	5.0	4.1	3.8	1.3	3.9	137	2741
All crops and grass	3.2	0.3	0.3	0.3	0.3	4.4	4.5	4.2	3.8	6.9	1.5	4.3	382	6304

Source: British Survey of Fertiliser Practice 2020

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2020

	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	4	0	3	5	9	18	16	23	12	9	1	1	-	-	-	-	-	-	173
Winter wheat	1	0	1	5	2	11	10	16	15	17	13	5	3	2	-	-	-	-	883
Spring barley	2	1	8	13	16	29	22	7	1	-	-	-	-	-	-	-	-	-	722
Winter barley	2	0	3	5	9	17	21	21	17	6	1	-	-	-	-	-	-	-	339
Oats	12	0	3	13	20	37	11	4	0	1	-	-	-	-	-	-	-	-	208
Rye/triticale/Durum wheat	10	7	2	30	1	12	3	24	9	-	-	-	-	-	-	-	-	-	29
Potatoes (seed or earlies)	0	0	46	0	0	6	40	0	0	0	8	-	-	-	-	-	-	-	6
Potatoes (maincrop)	10	0	4	3	32	15	3	8	4	17	3	1	1	-	-	-	-	-	47
Sugar beet	2	11	21	22	16	25	1	1	1	-	-	-	-	-	-	-	-	-	82
Spring oilseed rape	0	0	5	30	27	27	5	7	-	-	-	-	-	-	-	-	-	-	21
Winter oilseed rape	1	1	2	4	4	10	10	10	20	18	14	4	2	-	-	-	-	-	271
Linseed	0	0	19	31	26	22	2	-	-	-	-	-	-	-	-	-	-	-	28
Forage maize	13	22	12	11	16	12	11	3	-	-	-	-	-	-	-	-	-	-	186
Rootcrops for stockfeed	22	1	20	23	22	11	1	-	-	-	-	-	-	-	-	-	-	-	43
Leafy forage crops	39	7	18	19	11	0	5	-	-	-	-	-	-	-	-	-	-	-	33
Arable silage/other fodder crops	59	1	4	5	8	6	5	1	0	9	0	0	1	-	-	-	-	-	103
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Peas - animal consumption	99	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	98	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182
Vegetables (brassicae)	50	0	0	8	0	42	-	-	-	-	-	-	-	-	-	-	-	-	7
Vegetables (other)	28	2	21	11	1	0	5	0	19	12	-	-	-	-	-	-	-	-	30
Soft Fruit	11	0	32	29	0	19	8	-	-	-	-	-	-	-	-	-	-	-	18
Top Fruit	26	4	35	13	4	4	9	0	6	-	-	-	-	-	-	-	-	-	23
Other tillage	48	2	14	3	6	4	18	4	-	-	-	-	-	-	-	-	-	-	52
All tillage	11	2	5	8	9	17	13	11	9	8	5	2	1	1	-	-	-	-	3563
Grass under 5 years old	22	2	8	12	9	8	10	10	3	3	3	3	1	2	1	-	-	-	721
Grass 5 years and over	51	3	12	12	6	4	3	3	1	2	1	1	-	-	-	-	-	-	2020
All grass	46	3	11	12	7	4	4	4	2	2	2	1	-	-	-	-	-	-	2741
All crops and grass	30	2	8	10	8	10	8	7	5	5	3	2	1	-	-	-	-	-	6304

Source: British Survey of Fertiliser Practice 2020

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2020

	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	77	2	12	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	173
Winter wheat	59	3	18	12	6	2	-	-	-	-	-	-	-	-	-	-	-	-	883
Spring barley	60	8	15	12	3	1	1	-	-	-	-	-	-	-	-	-	-	-	722
Winter barley	54	5	19	17	5	1	-	-	-	-	-	-	-	-	-	-	-	-	339
Oats	64	9	15	9	1	0	1	-	-	-	-	-	-	-	-	-	-	-	208
Rye/triticale/Durum wheat	79	2	15	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Potatoes (seed or earlies)	38	6	0	8	0	0	49	-	-	-	-	-	-	-	-	-	-	-	6
Potatoes (maincrop)	16	0	20	2	29	7	3	3	4	15	1	1	-	-	-	-	-	-	47
Sugar beet	48	18	20	5	7	1	-	-	-	-	-	-	-	-	-	-	-	-	82
Spring oilseed rape	59	0	29	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Winter oilseed rape	54	5	15	17	8	1	-	-	-	-	-	-	-	-	-	-	-	-	271
Linseed	90	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Forage maize	33	10	16	33	2	5	0	1	-	-	-	-	-	-	-	-	-	-	186
Rootcrops for stockfeed	52	5	14	11	15	2	1	-	-	-	-	-	-	-	-	-	-	-	43
Leafy forage crops	60	13	21	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Arable silage/other fodder crops	80	8	4	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	103
Peas - human consumption	87	0	0	7	2	0	4	-	-	-	-	-	-	-	-	-	-	-	38
Peas - animal consumption	77	0	2	15	2	4	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	77	3	6	10	1	4	-	-	-	-	-	-	-	-	-	-	-	-	182
Vegetables (brassicae)	50	22	7	1	20	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Vegetables (other)	51	23	8	16	2	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Soft Fruit	64	5	0	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Top Fruit	72	9	6	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Other tillage	64	4	2	24	2	2	0	2	-	-	-	-	-	-	-	-	-	-	52
All tillage	60	6	15	13	4	2	-	-	-	-	-	-	-	-	-	-	-	-	3563
Grass under 5 years old	62	18	14	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	721
Grass 5 years and over	71	22	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2020
All grass	69	21	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2741
All crops and grass	65	14	11	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	6304

Source: British Survey of Fertiliser Practice 2020

NB: Outliers can be observed in these tables where dressings have been made as part of a rotational manuring policy.

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2020

	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	83	5	3	8	1	1	-	-	-	-	-	-	-	-	-	-	-	-	173
Winter wheat	57	4	10	15	9	3	0	1	-	-	-	-	-	-	-	-	-	-	883
Spring barley	63	5	13	10	5	3	-	-	-	-	-	-	-	-	-	-	-	-	722
Winter barley	48	5	8	21	12	4	0	2	-	-	-	-	-	-	-	-	-	-	339
Oats	66	4	11	13	2	3	1	-	-	-	-	-	-	-	-	-	-	-	208
Rye/triticale/Durum wheat	67	23	5	0	0	0	0	0	4	-	-	-	-	-	-	-	-	-	29
Potatoes (seed or earlies)	38	0	0	0	6	0	0	0	0	40	0	0	8	8	-	-	-	-	6
Potatoes (maincrop)	9	0	0	5	37	4	8	3	3	1	4	12	0	8	5	0	1	-	47
Sugar beet	40	7	13	17	4	10	4	3	1	-	-	-	-	-	-	-	-	-	82
Spring oilseed rape	81	0	0	15	2	2	-	-	-	-	-	-	-	-	-	-	-	-	21
Winter oilseed rape	60	6	9	13	9	3	-	-	-	-	-	-	-	-	-	-	-	-	271
Linseed	94	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Forage maize	67	5	9	5	6	2	5	2	-	-	-	-	-	-	-	-	-	-	186
Rootcrops for stockfeed	45	5	21	11	7	8	0	2	0	0	0	0	0	0	0	1	-	-	43
Leafy forage crops	51	13	23	5	0	7	1	-	-	-	-	-	-	-	-	-	-	-	33
Arable silage/other fodder crops	74	8	9	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	103
Peas - human consumption	89	0	0	2	3	0	4	2	-	-	-	-	-	-	-	-	-	-	38
Peas - animal consumption	78	3	8	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	76	2	7	6	6	3	-	-	-	-	-	-	-	-	-	-	-	-	182
Vegetables (brassicae)	50	22	0	1	0	0	0	7	20	-	-	-	-	-	-	-	-	-	7
Vegetables (other)	41	14	11	10	2	10	0	0	0	0	0	12	-	-	-	-	-	-	30
Soft Fruit	16	0	22	7	10	19	0	0	0	25	-	-	-	-	-	-	-	-	18
Top Fruit	53	0	11	0	10	7	0	13	5	-	-	-	-	-	-	-	-	-	23
Other tillage	83	2	8	0	0	3	0	0	4	0	0	1	-	-	-	-	-	-	52
All tillage	61	5	10	12	7	3	1	1	-	-	-	-	-	-	-	-	-	-	3563
Grass under 5 years old	56	15	14	6	5	2	1	1	-	-	-	-	-	-	-	-	-	-	721
Grass 5 years and over	69	20	7	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2020
All grass	67	19	8	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2741
All crops and grass	65	12	9	7	4	2	1	-	-	-	-	-	-	-	-	-	-	-	6304

Source: British Survey of Fertiliser Practice 2020

NB: Outliers can be observed in these tables where dressings have been made as part of a rotational manuring policy.

Table EW1.8 Percentage of crop area by field application rate - Sulphur, England & Wales 2020

	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	32	13	31	16	6	1	-	-	-	-	-	-	-	-	-	-	-	-	173
Winter wheat	27	9	26	22	9	4	1	2	-	-	-	-	-	-	-	-	-	-	883
Spring barley	47	12	23	12	5	1	0	0	1	-	-	-	-	-	-	-	-	-	722
Winter barley	25	10	35	23	4	1	1	1	-	-	-	-	-	-	-	-	-	-	339
Oats	54	8	25	8	4	1	-	-	-	-	-	-	-	-	-	-	-	-	208
Rye/triticale/Durum wheat	36	30	11	14	7	2	-	-	-	-	-	-	-	-	-	-	-	-	29
Potatoes (seed or earlies)	87	0	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Potatoes (maincrop) [1]	86	4	3	1	1	4	0	0	0	0	0	0	0	0	0	0	1	-	47
Sugar beet	31	29	16	14	3	5	0	0	1	1	-	-	-	-	-	-	-	-	82
Spring oilseed rape	16	13	15	9	34	0	13	-	-	-	-	-	-	-	-	-	-	-	21
Winter oilseed rape	17	6	13	20	25	8	4	4	1	-	-	-	-	-	-	-	-	-	271
Linseed	22	22	30	21	6	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Forage maize	73	11	12	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	186
Rootcrops for stockfeed	83	8	8	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	43
Leafy forage crops	76	13	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
Arable silage/other fodder crops	76	11	3	6	1	0	0	0	3	-	-	-	-	-	-	-	-	-	103
Peas - human consumption	93	0	4	0	0	3	-	-	-	-	-	-	-	-	-	-	-	-	38
Peas - animal consumption	89	3	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	93	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182
Vegetables (brassicae)	80	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Vegetables (other)	76	2	18	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Soft Fruit	52	32	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Top Fruit	81	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
Other tillage	74	15	1	4	3	0	0	0	3	-	-	-	-	-	-	-	-	-	52
All tillage	42	10	21	15	7	2	1	1	-	-	-	-	-	-	-	-	-	-	3563
Grass under 5 years old	71	10	11	4	2	1	1	-	-	-	-	-	-	-	-	-	-	-	721
Grass 5 years and over	89	6	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2020
All grass	86	7	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2741
All crops and grass	66	8	12	8	4	1	-	-	-	-	-	-	-	-	-	-	-	-	6304

[1] Some potato crops receive a high rate of sulphur as a soil acidifier for the reduction of Common Scab (*Streptomyces scabiei*)

Source: British Survey of Fertiliser Practice 2020

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Grazed not mown	41	25	26	9	20	75	17	19	29	31	4	5	3	1249
Grazed mown	71	42	45	21	63	110	25	37	37	79	11	16	8	1241
All grazings	52	31	32	13	35	92	21	28	33	48	7	9	4	2490
Cut for silage - grazed	80	46	50	24	71	117	26	39	38	94	12	19	9	902
Cut for silage - not grazed	81	32	40	23	74	166	36	58	38	135	11	24	9	173
All cut for silage	80	43	48	24	71	126	27	42	38	101	12	20	9	1075
Cut for hay - grazed	49	32	34	13	41	71	23	25	26	35	8	9	3	362
Cut for hay - not grazed	47	15	18	2	17	99	17	21	52	46	2	4	1	58
All cut for hay	49	30	32	12	38	75	23	25	26	36	7	8	3	420
All mowings	72	39	43	20	63	118	26	39	37	85	10	17	8	1469
All grass	54	31	33	14	37	98	22	30	34	53	7	10	5	2741

[1] The term FYM in this table denotes all organic manures.

Source: British Survey of Fertiliser Practice 2020

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2020

	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	59	3	13	11	5	3	3	2	0	1	-	-	-	-	-	-	-	-	1249
Grazed mown	29	4	10	15	10	7	7	6	3	3	3	1	1	1	1	-	-	-	1241
All grazings	48	3	12	12	7	4	4	4	1	2	1	1	-	-	-	-	-	-	2490
Cut for silage - grazed	20	3	9	15	10	9	9	8	4	4	4	2	1	1	1	-	-	-	902
Cut for silage - not grazed	19	0	4	7	9	8	5	11	9	6	9	10	0	2	0	0	0	1	173
All cut for silage	20	3	8	14	10	9	9	8	5	4	5	3	1	1	1	-	-	-	1075
Cut for hay - grazed	51	5	14	12	8	2	4	3	0	1	-	-	-	-	-	-	-	-	362
Cut for hay - not grazed	53	1	4	11	9	5	4	12	-	-	-	-	-	-	-	-	-	-	58
All cut for hay	51	4	13	12	8	3	4	4	0	1	-	-	-	-	-	-	-	-	420
All mowings	28	3	9	14	10	7	7	7	4	4	4	2	0	1	1	-	-	-	1469
All grass	46	3	11	12	7	4	4	4	2	2	2	1	-	-	-	-	-	-	2741

Source: British Survey of Fertiliser Practice 2020

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2020

	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	75	20	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1249
Grazed mown	58	25	12	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1241
All grazings	69	22	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2490
Cut for silage - grazed	54	27	14	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	902
Cut for silage - not grazed	68	14	12	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	173
All cut for silage	57	24	14	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1075
Cut for hay - grazed	68	22	7	1	0	2	-	-	-	-	-	-	-	-	-	-	-	-	362
Cut for hay - not grazed	85	13	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
All cut for hay	70	21	6	1	0	2	-	-	-	-	-	-	-	-	-	-	-	-	420
All mowings	61	23	12	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1469
All grass	69	21	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2741

Source: British Survey of Fertiliser Practice 2020

Table EW2.4 Percentage of grass area by field application rate - Potash, England & Wales 2020

	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	74	19	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1249
Grazed mown	55	21	13	5	3	2	1	-	-	-	-	-	-	-	-	-	-	-	1241
All grazings	68	20	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2490
Cut for silage - grazed	50	22	15	6	3	2	1	-	-	-	-	-	-	-	-	-	-	-	902
Cut for silage - not grazed	60	10	13	1	8	5	1	-	-	-	-	-	-	-	-	-	-	-	173
All cut for silage	52	20	15	5	4	3	1	-	-	-	-	-	-	-	-	-	-	-	1075
Cut for hay - grazed	66	21	8	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	362
Cut for hay - not grazed	82	13	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
All cut for hay	68	20	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	420
All mowings	57	19	13	4	3	2	1	-	-	-	-	-	-	-	-	-	-	-	1469
All grass	67	19	8	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2741

Source: British Survey of Fertiliser Practice 2020

Table EW2.5 Percentage of grass area by field application rate - Sulphur, England & Wales 2020

	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	91	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1249
Grazed mown	79	9	7	2	1	0	1	-	-	-	-	-	-	-	-	-	-	-	1241
All grazings	87	7	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2490
Cut for silage - grazed	76	10	9	3	1	0	1	-	-	-	-	-	-	-	-	-	-	-	902
Cut for silage - not grazed	77	3	14	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	173
All cut for silage	76	9	10	3	1	0	1	-	-	-	-	-	-	-	-	-	-	-	1075
Cut for hay - grazed	87	9	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	362
Cut for hay - not grazed	98	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
All cut for hay	88	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420
All mowings	80	8	8	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1469
All grass	86	7	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2741

Source: British Survey of Fertiliser Practice 2020

Table EW3.0 Product use by month of application, England & Wales 2020

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	3	30	40	17	5	3	1
Straight P	15	5	16	0	0	4	32	22	5	0	0	0
Straight K	3	5	12	1	0	5	42	25	5	1	0	1
Compounds	6	3	2	0	0	2	23	32	15	8	4	4
All fertilisers	2	1	2	0	0	3	28	37	16	6	3	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	0	0	0	0	0	3	27	40	18	7	3	2
Phosphate	10	5	8	0	0	3	27	28	10	3	2	3
Potash	6	4	7	1	0	3	29	29	10	5	3	2
Sulphur	0	0	0	0	0	5	46	34	9	3	1	0
Total	2	1	2	0	0	3	30	37	15	5	3	2

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

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2020.

'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 2020

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2020

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	46.1	47.4	8.2	20.1	45.5	22.5	42.5	34.5	33.3	35.1	16.9	35.5	40.6
Urea	6.1	8.1	0.0	2.5	9.7	3.8	7.0	4.1	3.5	4.4	1.9	4.1	6.2
Calcium Ammonium Nitrate (CAN)	1.8	1.7	0.0	3.3	2.5	2.0	1.9	2.3	0.9	2.4	0.0	2.1	1.9
Urea Ammonium Nitrate (UAN)	15.2	18.9	2.7	6.7	18.8	7.8	16.1	3.3	5.5	3.4	33.9	3.6	12.6
Other Straight N	1.4	1.2	0.6	1.1	2.9	1.7	1.5	1.1	0.0	2.5	0.0	1.8	1.6
Triple Superphosphate (TSP)	3.5	3.6	2.7	0.9	2.7	5.2	3.5	0.8	0.3	0.6	1.8	0.9	2.8
Other Straight P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muriate of Potash (MOP)	3.0	3.8	5.6	1.0	2.9	7.2	3.8	0.9	1.5	1.0	7.4	1.1	3.0
Other Straight K	0.8	0.4	5.8	21.5	0.7	1.4	1.4	0.3	1.1	0.3	3.2	0.4	1.1
PK	7.1	8.7	2.1	21.3	5.5	13.9	8.6	3.0	2.8	3.2	3.6	2.9	7.0
NK	0.4	0.8	5.6	0.0	0.5	3.8	1.1	4.8	3.1	7.0	0.0	5.2	2.2
Low N (<19% N)	4.1	1.8	66.7	11.6	6.5	21.2	7.0	3.9	3.7	3.6	13.9	3.7	6.1
High N (>=19% N)	10.3	3.5	0.0	6.4	1.2	8.3	5.3	40.8	44.2	36.6	14.3	38.7	14.5
Other	0.1	0.1	0.0	3.4	0.6	1.2	0.4	0.1	0.0	0.1	3.0	0.1	0.3
Total product ('000 tonnes)	**510**	**1025**	**42**	**50**	**230**	**134**	**1991**	**761**	**66**	**517**	**8**	**893**	**2884**

Source: British Survey of Fertiliser Practice 2020

Table EW3.2 Use of product type by crop group, England & Wales 2020

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	26.5	55.3	0.4	1.1	12.0	4.6	71.3	81.8	6.5	60.4	0.3	28.7	1201
Urea	26.6	55.4	0.0	1.1	14.6	2.2	80.6	83.8	4.8	61.9	0.7	19.4	189
Calcium Ammonium Nitrate (CAN)	32.1	44.0	0.0	4.9	10.8	8.2	74.7	96.8	2.6	67.1	0.0	25.3	68
Urea Ammonium Nitrate (UAN)	24.2	59.4	0.2	1.2	12.2	2.8	93.0	82.0	13.8	47.0	14.4	7.0	424
Other Straight N	26.5	40.6	0.8	1.7	22.7	7.8	59.6	48.8	0.0	66.0	0.0	40.4	45
Triple Superphosphate (TSP)	25.6	50.1	1.2	0.6	9.0	13.4	93.3	56.0	1.0	77.1	2.5	6.7	66
Other Straight P	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash (MOP)	17.0	51.0	2.5	1.1	10.5	17.9	92.3	42.1	3.8	74.6	10.9	7.7	70
Other Straight K	10.3	30.9	5.1	31.6	13.3	8.9	88.5	78.7	14.9	59.6	18.2	11.5	28
PK	21.9	55.3	0.3	5.5	7.2	9.8	88.6	97.1	21.4	63.6	0.3	11.4	178
NK	10.2	27.9	13.4	0.0	5.0	43.5	19.1	76.7	1.7	82.5	0.0	80.9	58
Low N (<19% N)	18.3	15.0	26.1	7.6	12.6	20.4	85.1	86.2	10.8	59.0	3.0	14.9	143
High N (>=19% N)	56.6	29.9	0.0	2.6	2.8	8.0	15.2	91.9	8.5	50.7	0.1	84.8	406
Other	10.4	15.4	0.0	36.7	10.9	26.7	90.2	100.0	0.0	86.7	13.3	9.8	7
All Fertilisers	**25.6**	**51.5**	**2.1**	**2.5**	**11.6**	**6.8**	**69.0**	**85.2**	**7.4**	**57.9**	**0.9**	**31.0**	**2884**

Source: British Survey of Fertiliser Practice 2020

Table EW3.3 Product use by month of application, England & Wales 2020

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.3	2.4	27.4	39.3	18.4	6.7	3.2	1.9	0.2	0.0	0.2	0.0	1201
Urea	0.1	4.5	38.0	39.5	11.0	3.8	1.3	0.2	0.2	0.1	1.1	0.0	189
Calcium Ammonium Nitrate (CAN)	0.0	3.1	23.3	43.6	21.2	2.0	2.6	2.7	1.3	0.2	0.0	0.0	68
Urea Ammonium Nitrate (UAN)	0.2	3.4	33.1	43.3	14.7	3.4	1.6	0.2	0.1	0.0	0.0	0.0	424
Other Straight N	0.0	2.4	27.9	44.2	13.8	5.6	2.0	2.9	1.3	0.0	0.0	0.0	45
Triple Superphosphate (TSP)	0.0	4.5	32.2	21.8	4.4	0.3	0.1	0.5	14.9	5.4	16.1	0.0	66
Other Straight P	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash (MOP)	0.0	3.8	36.2	28.0	5.0	1.0	0.3	1.3	3.6	4.3	16.4	0.3	70
Other Straight K	0.0	9.8	56.9	18.5	4.1	0.0	0.0	0.0	0.0	6.8	1.8	2.0	28
PK	0.4	1.2	24.7	17.3	5.8	1.9	1.7	5.5	18.6	12.8	8.3	1.4	178
NK	0.0	1.3	5.9	21.4	19.9	33.6	14.8	3.0	0.1	0.0	0.0	0.0	58
Low N (<19% N)	0.3	6.8	33.1	34.9	8.0	1.9	0.8	4.7	8.1	0.3	1.0	0.0	143
High N (>=19% N)	0.0	0.7	20.2	39.4	21.8	9.4	5.3	2.4	0.6	0.1	0.1	0.0	406
Other	0.0	3.0	38.4	25.4	8.4	0.0	0.0	0.0	0.0	10.7	14.1	0.0	7
All Fertilisers	**0.2**	**2.7**	**28.1**	**37.2**	**15.8**	**5.9**	**3.0**	**2.0**	**2.2**	**1.2**	**1.6**	**0.1**	**2884**

Source: British Survey of Fertiliser Practice 2020

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2020

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
North West	All tillage	85	14	35	38	117	24	69	100	3	24	100
	All grass	59	36	41	51	109	18	30	64	7	12	324
	All crops and grass	63	33	40	49	110	19	34	69	6	14	424
North East	All tillage	86	74	69	24	161	56	69	139	41	47	163
	All grass	32	20	22	20	71	39	47	23	8	10	182
	All crops and grass	47	35	34	21	116	49	59	54	17	20	345
Eastern	All tillage	91	40	37	12	140	53	63	128	21	23	708
	All grass	27	10	10	4	66	49	32	18	5	3	89
	All crops and grass	84	37	34	11	137	53	62	115	20	21	797
Yorkshire and the Humber	All tillage	92	44	47	23	151	56	69	139	25	33	651
	All grass	54	36	36	37	99	24	34	53	9	12	373
	All crops and grass	75	41	42	29	135	44	56	101	18	24	1024
West Midlands	All tillage	91	25	29	34	126	41	73	115	10	21	325
	All grass	60	26	31	35	115	26	40	69	7	12	238
	All crops and grass	73	26	30	35	121	32	53	88	8	16	563
East Midlands	All tillage	84	34	26	22	135	56	59	114	19	15	472
	All grass	52	12	13	34	112	31	30	58	4	4	185
	All crops and grass	73	27	21	26	129	52	53	95	14	11	657
South West	All tillage	85	54	51	42	116	47	59	99	25	30	629
	All grass	57	32	34	42	98	20	30	56	6	10	697
	All crops and grass	66	39	39	42	105	32	42	70	13	16	1326
South East	All tillage	88	34	34	23	156	56	68	138	19	23	403
	All grass	32	11	12	17	98	26	31	31	3	4	218
	All crops and grass	66	25	26	21	146	51	61	96	13	16	621
Wales	All tillage	84	53	59	53	114	62	85	95	33	51	112
	All grass	64	49	50	41	85	18	22	54	9	11	435
	All crops and grass	66	50	51	42	89	22	29	58	11	15	547

[1] All organic manures

Source: British Survey of Fertiliser Practice 2020

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2020

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM[1]	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Wessex	All tillage	82	48	46	41	115	48	60	94	23	27	351
	All grass	48	15	17	42	98	17	26	47	3	4	304
	All crops and grass	62	29	29	42	107	39	48	67	11	14	655
Anglia	All tillage	91	40	37	12	140	53	63	128	21	23	708
	All grass	27	10	10	4	66	49	32	18	5	3	89
	All crops and grass	84	37	34	11	137	53	62	115	20	21	797
Northern	All tillage	79	66	67	33	142	47	64	113	31	43	170
	All grass	50	34	38	41	94	24	35	47	8	13	408
	All crops and grass	54	39	42	40	104	29	42	56	11	17	578
North East	All tillage	92	45	47	23	152	57	70	140	26	33	696
	All grass	56	36	36	37	92	23	32	52	8	11	410
	All crops and grass	76	23	42	29	132	44	55	100	18	23	1106
North Mercia	All tillage	92	25	32	41	128	45	78	117	11	25	205
	All grass	62	24	28	45	134	26	33	82	6	9	199
	All crops and grass	71	25	29	44	131	33	49	94	8	14	404
South Mercia	All tillage	90	23	28	27	128	38	68	115	9	19	204
	All grass	42	16	24	17	91	24	50	38	4	12	113
	All crops and grass	67	20	26	22	116	32	60	77	6	15	317
East Midland	All tillage	84	34	26	22	135	56	59	114	19	15	472
	All grass	52	12	13	34	112	31	30	58	4	4	185
	All crops and grass	73	27	21	26	129	52	53	95	14	11	657
South East	All tillage	88	34	34	23	156	56	68	138	19	23	403
	All grass	32	11	12	17	98	26	31	31	3	4	218
	All crops and grass	66	25	26	21	146	51	61	96	13	16	621
South West	All tillage	92	71	70	48	113	45	55	104	32	39	242
	All grass	66	47	49	43	98	21	31	65	10	15	380
	All crops and grass	71	52	53	44	102	27	37	72	14	20	622
Wales	All tillage	84	53	59	53	114	62	85	95	33	51	112
	All grass	64	49	50	41	85	18	22	54	9	11	435
	All crops and grass	66	50	51	42	89	22	29	58	11	15	547

[1] All organic manures

Source: British Survey of Fertiliser Practice 2020

Table SC1.1 Total fertiliser use, Scotland 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Winter wheat	98	88	88	79	20	170	45	67	62	167	39	59	49	64
Spring barley	98	92	91	60	40	95	49	67	39	93	44	61	23	183
Winter barley	100	88	88	83	37	156	49	69	49	156	43	60	41	49
Oats	81	77	73	39	32	91	39	51	43	74	30	37	17	52
Potatoes	100	100	84	7	19	91	112	209	-	91	112	176	-	8
Winter oilseed rape	100	88	82	78	15	157	56	60	71	157	49	49	55	24
Other crops	61	54	51	31	31	96	38	54	37	59	20	27	11	81
All tillage	93	85	84	60	33	117	48	67	47	109	41	56	29	461
Grass less than five years old	81	68	70	36	43	111	29	44	35	90	20	31	13	237
Grass five years and over	60	48	50	17	25	78	19	27	26	46	9	14	4	367
All grass	65	53	54	21	29	87	22	32	30	56	12	18	6	604
All crops and grass	74	63	64	34	30	99	33	47	40	73	21	30	14	1065

[1] The term FYM in this table denotes all organic manures

Source: British Survey of Fertiliser Practice 2020

NB: 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 SC1.2 Use of straight fertiliser, Scotland 2020

	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	98	2	7	150	-	-	147	-	-	64
Spring barley	66	1	0	70	-	-	46	-	-	183
Winter barley	100	0	0	138	-	-	137	-	-	49
Oats	61	10	12	73	-	-	45	-	-	52
Potatoes	7	0	43	-	-	-	-	-	-	8
Winter oilseed rape	100	0	4	128	-	-	128	-	-	24
Other crops	39	2	5	83	-	-	32	-	-	81
All tillage	72	2	4	101	55	94	73	1	3	461
Grass less than five years old	36	2	4	100	65	143	36	1	5	237
Grass five years and over	17	0	1	74	-	127	13	-	1	367
All grass	22	1	2	84	60	134	18	0	2	604
All crops and grass	38	1	2	95	57	114	36	1	3	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.3 Use of compound fertiliser, Scotland 2020

	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	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Winter wheat	54	88	88	34	36	42	59	46	20	37	52	16	64
Spring barley	88	92	91	47	54	48	67	33	47	44	61	15	183
Winter barley	57	88	88	34	32	49	69	41	19	43	60	14	49
Oats	66	67	63	28	44	38	51	37	29	25	32	11	52
Potatoes	100	100	71	0	84	112	137	-	84	112	98	-	8
Winter oilseed rape	80	88	77	21	36	56	59	97	29	49	46	21	24
Other crops	47	52	51	15	56	38	46	22	26	20	23	3	81
All tillage	74	84	83	37	49	48	64	37	36	40	53	14	461
Grass less than five years old	69	67	68	24	78	28	37	25	54	19	26	6	237
Grass five years and over	49	48	49	15	69	19	25	23	34	9	12	3	367
All grass	53	52	53	17	71	22	29	24	38	11	15	4	604
All crops and grass	60	63	63	23	63	33	43	31	38	21	27	7	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.4 Use of lime, Scotland 2020

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)						Fields limed	Fields in sample
	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All	Limestone (ground, screened)	Chalk	Magnesian limestone	Sugar beet lime	Other	All		
Winter wheat	2.0	0.8	1.0	-	2.7	6.4	5.0	5.0	5.0	-	5.0	5.0	7	64
Spring barley	3.5	0.1	2.4	-	3.7	9.7	5.0	5.0	5.0	-	1.2	3.6	28	183
Winter barley	3.0	2.4	-	-	3.0	8.4	5.0	5.0	-	-	0.3	3.3	5	49
Oats	4.4	-	-	-	3.7	8.1	5.0	-	-	-	3.5	4.3	6	52
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	4	24
Other crops	19.2	-	0.7	-	4.7	24.6	3.8	-	2.2	-	3.6	3.7	21	81
All tillage	5.3	0.4	1.4	-	3.3	10.4	4.4	5.0	4.9	-	2.2	3.8	71	461
Grass less than five years old	8.5	-	1.3	-	0.6	10.5	4.4	-	4.9	-	3.9	4.5	38	237
Grass five years and over	2.6	-	0.2	-	0.1	2.8	4.8	-	4.6	-	5.0	4.8	30	367
All grass	3.9	-	0.4	-	0.2	4.6	4.6	-	4.8	-	4.3	4.6	68	604
All crops and grass	4.4	0.1	0.7	-	1.2	6.5	4.5	5.0	4.9	-	2.5	4.2	139	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2020

	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	2	0	1	11	2	5	9	16	20	19	11	0	4	-	-	-	-	-	64
Spring barley	2	0	10	11	28	40	7	3	-	-	-	-	-	-	-	-	-	-	183
Winter barley	0	0	2	3	1	17	17	24	23	14	-	-	-	-	-	-	-	-	49
Oats	19	4	19	2	18	16	12	8	2	-	-	-	-	-	-	-	-	-	52
Potatoes	0	0	30	32	13	0	4	0	0	21	-	-	-	-	-	-	-	-	8
Winter oilseed rape	0	0	0	17	0	19	12	8	4	18	23	-	-	-	-	-	-	-	24
Other crops	39	2	9	6	8	26	7	4	-	-	-	-	-	-	-	-	-	-	81
All tillage	7	1	8	9	16	27	9	8	6	6	3	0	1	-	-	-	-	-	461
Grass less than five years old	19	3	10	12	16	12	11	4	5	4	1	3	0	0	1	-	-	-	237
Grass five years and over	40	1	17	16	8	10	2	2	1	2	1	-	-	-	-	-	-	-	367
All grass	35	1	16	15	10	10	4	2	2	2	1	1	-	-	-	-	-	-	604
All crops and grass	26	1	13	13	12	16	6	4	3	3	1	-	-	-	-	-	-	-	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2020

	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	12	21	23	40	2	0	2	-	-	-	-	-	-	-	-	-	-	-	64
Spring barley	8	9	35	41	6	0	1	-	-	-	-	-	-	-	-	-	-	-	183
Winter barley	12	10	34	38	7	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Oats	23	22	23	27	4	-	-	-	-	-	-	-	-	-	-	-	-	-	52
Potatoes	0	0	0	49	3	0	11	22	0	15	-	-	-	-	-	-	-	-	8
Winter oilseed rape	12	7	16	45	20	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Other crops	46	18	24	6	2	1	1	-	-	-	-	-	-	-	-	-	-	-	81
All tillage	15	13	29	36	5	0	1	-	-	-	-	-	-	-	-	-	-	-	461
Grass less than five years old	32	34	20	13	1	-	-	-	-	-	-	-	-	-	-	-	-	-	237
Grass five years and over	52	35	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	367
All grass	47	35	13	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	604
All crops and grass	37	28	18	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2020

	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	12	16	8	23	24	8	8	-	-	-	-	-	-	-	-	-	-	-	64
Spring barley	9	2	22	29	28	10	1	-	-	-	-	-	-	-	-	-	-	-	183
Winter barley	12	8	1	40	32	7	-	-	-	-	-	-	-	-	-	-	-	-	49
Oats	27	18	15	28	13	-	-	-	-	-	-	-	-	-	-	-	-	-	52
Potatoes	16	0	0	0	19	0	4	3	13	0	0	30	0	15	-	-	-	-	8
Winter oilseed rape	18	7	8	51	15	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Other crops	49	14	14	7	9	6	-	-	-	-	-	-	-	-	-	-	-	-	81
All tillage	16	7	15	28	24	7	2	0	0	0	0	1	-	-	-	-	-	-	461
Grass less than five years old	30	22	22	18	4	1	1	1	0	1	-	-	-	-	-	-	-	-	237
Grass five years and over	50	28	15	4	1	0	1	-	-	-	-	-	-	-	-	-	-	-	367
All grass	46	27	16	7	2	0	1	1	-	-	-	-	-	-	-	-	-	-	604
All crops and grass	36	21	16	14	9	3	1	-	-	-	-	-	-	-	-	-	-	-	1065

Source: British Survey of Fertiliser Practice 2020

Table SC1.8 Percentage of crop area by field application rate - Sulphur, Scotland 2020

	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	21	10	22	30	10	0	1	6	-	-	-	-	-	-	-	-	-	-	64
Spring barley	40	17	30	7	6	-	-	-	-	-	-	-	-	-	-	-	-	-	183
Winter barley	17	11	27	38	7	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Oats	61	11	15	9	2	0	0	2	-	-	-	-	-	-	-	-	-	-	52
Potatoes	93	0	0	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Winter oilseed rape	22	10	20	23	1	3	16	4	-	-	-	-	-	-	-	-	-	-	24
Other crops	69	3	26	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	81
All tillage	40	13	26	14	5	0	1	2	-	-	-	-	-	-	-	-	-	-	461
Grass less than five years old	64	12	18	3	2	0	1	-	-	-	-	-	-	-	-	-	-	-	237
Grass five years and over	83	9	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	367
All grass	79	10	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	604
All crops and grass	66	11	14	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1065

Source: British Survey of Fertiliser Practice 2020

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2020

	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[1]	N	P_2O_5	K_2O	SO_3	N	P_2O_5	K_2O	SO_3	
Grazed not mown	54	45	44	14	15	69	18	21	20	38	8	9	3	345
Grazed mown	91	73	80	41	62	114	27	47	38	104	20	38	15	246
All grazings	65	53	54	21	29	87	22	32	30	56	12	17	6	591
Cut for silage - grazed	91	72	81	41	65	118	28	48	38	107	20	39	16	209
Cut for silage - not grazed	56	52	52	25	65	122	32	46	-	69	17	24	-	10
All cut for silage	90	72	80	40	65	118	28	48	38	106	20	38	15	219
Cut for hay - grazed	91	78	77	34	34	79	20	32	35	72	16	25	12	39
Cut for hay - not grazed	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All cut for hay	91	78	78	33	33	79	21	33	35	72	17	25	12	41
All mowings	90	72	79	40	62	114	28	47	38	102	20	37	15	258
All grass	65	53	54	21	29	87	22	32	30	56	12	18	6	604

[1] The term FYM in this table denotes all organic manures.

Source: British Survey of Fertiliser Practice 2020

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2020

	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	46	0	20	16	6	7	3	1	0	1	-	-	-	-	-	-	-	-	345
Grazed mown	9	3	6	15	20	17	7	5	7	6	1	2	0	0	1	-	-	-	246
All grazings	35	1	16	15	10	10	4	2	2	2	1	1	-	-	-	-	-	-	591
Cut for silage - grazed	9	3	6	12	21	17	8	5	7	7	2	3	0	0	1	-	-	-	209
Cut for silage - not grazed	44	0	6	2	17	3	0	13	15	-	-	-	-	-	-	-	-	-	10
All cut for silage	10	3	6	12	21	17	8	5	7	7	1	3	0	0	1	-	-	-	219
Cut for hay - grazed	9	4	7	37	21	11	4	7	-	-	-	-	-	-	-	-	-	-	39
Cut for hay - not grazed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All cut for hay	9	4	7	36	23	11	3	7	-	-	-	-	-	-	-	-	-	-	41
All mowings	10	3	6	15	20	16	7	6	7	6	1	2	0	0	1	-	-	-	258
All grass	35	1	16	15	10	10	4	2	2	2	1	1	-	-	-	-	-	-	604

Source: British Survey of Fertiliser Practice 2020

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2020

	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	55	33	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	345
Grazed mown	27	41	20	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	246
All grazings	47	35	13	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	591
Cut for silage - grazed	28	38	21	12	1	-	-	-	-	-	-	-	-	-	-	-	-	-	209
Cut for silage - not grazed	48	17	29	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	10
All cut for silage	28	38	21	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	219
Cut for hay - grazed	22	56	18	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Cut for hay - not grazed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All cut for hay	22	54	20	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
All mowings	28	40	20	11	1	-	-	-	-	-	-	-	-	-	-	-	-	-	258
All grass	47	35	13	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	604

Source: British Survey of Fertiliser Practice 2020

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2020

	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	56	29	14	1	0	0	1	-	-	-	-	-	-	-	-	-	-	-	345
Grazed mown	20	23	23	23	6	1	1	2	0	1	-	-	-	-	-	-	-	-	246
All grazings	46	27	16	7	2	0	1	1	-	-	-	-	-	-	-	-	-	-	591
Cut for silage - grazed	19	22	24	23	7	1	1	2	0	1	-	-	-	-	-	-	-	-	209
Cut for silage - not grazed	48	15	21	6	10	-	-	-	-	-	-	-	-	-	-	-	-	-	10
All cut for silage	20	21	24	22	7	1	1	2	0	1	-	-	-	-	-	-	-	-	219
Cut for hay - grazed	23	32	22	22	1	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Cut for hay - not grazed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All cut for hay	22	31	25	21	1	-	-	-	-	-	-	-	-	-	-	-	-	-	41
All mowings	21	23	24	22	6	1	1	2	0	1	-	-	-	-	-	-	-	-	258
All grass	46	27	16	7	2	0	1	1	-	-	-	-	-	-	-	-	-	-	604

Source: British Survey of Fertiliser Practice 2020

Table SC2.5 Percentage of grass area by field application rate - Sulphur, Scotland 2020

	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	86	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	345
Grazed mown	59	14	16	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	246
All grazings	79	10	9	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	591
Cut for silage - grazed	59	14	16	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	209
Cut for silage - not grazed	75	0	15	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
All cut for silage	60	13	16	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	219
Cut for hay - grazed	66	12	18	3	0	1	-	-	-	-	-	-	-	-	-	-	-	-	39
Cut for hay - not grazed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
All cut for hay	67	12	18	3	0	1	-	-	-	-	-	-	-	-	-	-	-	-	41
All mowings	60	13	16	8	2	1	1	-	-	-	-	-	-	-	-	-	-	-	258
All grass	79	10	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	604

Source: British Survey of Fertiliser Practice 2020

Table SC3.0 Product use by month of application, Scotland 2020

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Straight N	0	0	0	0	0	2	17	47	23	7	4	1
Straight P	0	19	0	0	0	0	10	38	32	1	0	0
Straight K	0	0	0	0	0	18	34	16	31	1	0	0
Compounds	4	2	0	0	0	0	18	47	13	8	5	2
All fertilisers	3	1	0	0	0	1	18	47	17	7	4	2

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Nitrogen	1	0	0	0	0	1	16	48	20	8	5	2
Phosphate	7	4	0	0	0	0	21	46	10	5	3	3
Potash	5	3	0	0	0	2	25	42	12	6	2	2
Sulphur	1	0	0	0	0	1	30	44	13	7	3	0
Total	3	2	0	0	0	1	20	46	16	7	4	2

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

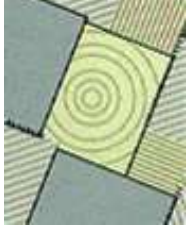
'Product' refers to the total tonnage of the products used by the farmers in the survey year 2020.

'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 2020



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2020

Introduction

Whilst the BSFP has focussed historically on the application of manufactured fertilisers, in the last 13 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. From 2007, and 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 1336 farms in the Survey 935 used organic manures on at least one field on the farm. Once the data are weighted to reflect the population of farms this equates to 65%. The details are shown in Table D1.1a.

Table D1.1a Numbers and percentage (%) of farms using each type of manure in Great Britain, 2020

	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	401	696	253	36	10	23	44	66	5	42	49	935
Farms in population	30,607	43,098	14,417	1,768	376	739	2,091	5,004	228	1,834	2,397	57,406
Farms in population %	35%	49%	16%	2%	0%	1%	2%	6%	0%	2%	3%	65%
Volume (Mt; Mm^3)	n/a	34.1	45.9	1.8	0.5	0.5	0.7	2.1	0.3	3.9	4.0	93.9
Volume %	n/a	36%	49%	2%	1%	1%	1%	2%	0%	4%	4%	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, 2016 – 2020

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2016	35.0	51.0	16.0	2.0	1.0	2.0	2.0	6.0	4.0
2017	37.0	47.0	16.0	2.0	1.0	1.0	1.0	5.0	4.0
2018	32.0	50.7	17.0	1.7	0.4	1.3	1.5	6.7	4.2
2019	33.0	50.4	17.3	1.8	0.4	1.3	2.1	6.3	4.5
2020	35.0	49.0	16.4	2.0	0.4	0.8	2.4	5.7	4.8

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 and cattle slurry has been reasonably consistent over the last 5 years with use in 2020 being 49% and 16% of farms, respectively.

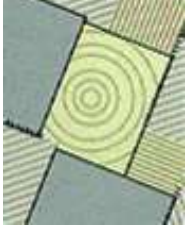


Table D1.1c Dressing cover of organic manure in Great Britain, 2016 - 2020

	all tillage	*grass 5 years and over*	*grass under 5 years old*
2016	23	31	48
2017	25	31	46
2018	27	33	52
2019	26	35	47
2020	25	32	51

Dressing cover of organic manure on tillage has averaged 25% in the five-year period 2016-2020. The proportion of grass receiving a dressing of manure is higher for both categories, at 32% of grass 5 years and over and 51% on grass under 5 years old in 2020.

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. Up to 2013 BSFP, the report included data on the quantities of manure which were imported onto farm or exported from farms and the number of farms involved. However these were all consistently very low and led to the conclusion that this activity was too small to be of significance or to provide robust data and collection of these data was discontinued (see 2013 BSFP report, Tables D1.2, D1.3a&b)[10].

The number and percentage of farms using each type of slurry application method in Great Britain are shown in Table D1.2. This table takes account of all applications whether they are made by the farmers themselves or contractors. 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 remains the most widespread method adopted for both types of slurry.

Table D1.2 Number and percentage (%) of tillage farms using each type of application method by slurry type, Great Britain 2020

			percentage of tillage farms						
	farms in sample	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*	*non-broadcast*
Cattle slurry	253	14,417	84	9	8	2	1	1	20
Pig slurry	10	376	40	24	41	0	0	0	60
Grand Total	260	14,579	83	9	8	2	1	1	20

Note: some farms may apply both types of slurry. Grass fields have been excluded from this table.

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.

[10] https://www.gov.uk/government/collections/fertiliser-usage

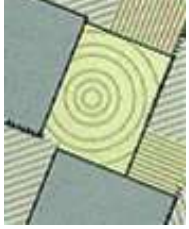


Table D1.3 gives estimates of the volume and area of manure/slurry incorporation on tillage fields by manure type and immediacy of incorporation. Farmyard manure is the most extensively incorporated at 93% of the volume with 80% of it incorporated within a week of spreading on tillage fields. Cattle slurry makes up 99% of all slurry volume (Table D2.3a) and 92% of cattle slurry was applied to grassland. Of the balance, the majority of cattle slurry applied to tillage fields is applied to spring-sown crops (Table D2.4). Data on pig slurry need to be treated with caution due to the relatively low number of farms using manure of this type. Table D2.3a suggests that pig slurry was effectively all applied to arable land, principally to winter sown crops, often using band spreading or shallow injection (Table D1.2).

Table D1.3 Percentage (%) of organic manure incorporated (volume and area) on tillage fields by incorporation time and manure/slurry type, Great Britain 2020

	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	7	7	8	9	34	37	37	34	14	13	728	16.2
Cattle slurry	49	31	13	21	10	13	25	31	3	4	146	3.9
Pig slurry	19	28	56	46	8	10	0	0	17	16	11	0.3
Poultry FYM	10	15	30	25	22	30	14	12	24	18	132	1.0
Other	15	20	51	49	13	12	18	15	4	4	261	6.1
Total	**14**	**14**	**20**	**21**	**26**	**27**	**29**	**28**	**12**	**10**	**1,277**	**27.5**

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 24% in 2020. Where contractors were used, they applied between 87% and 94% of the manure on average.

Table D1.4a Use of contractors to spread manure/slurry in current season, Great Britain 2020

	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	28	24	87
Cattle slurry	23	21	91
Other	54	63	94
Total	**27**	**27**	**90**

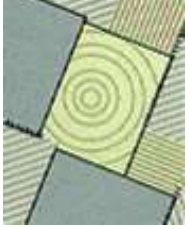
Use of contractors to spread manures is fairly consistent over the 5-year period 2016-2020, with an average of 31% of farms (Table 1.4b) spreading an average amount of 89%.

Table D1.4b Use of contractors to spread manure/slurry, Great Britain 2016 - 2020

	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
2016	34	32	83
2017	33	30	92
2018	30	30	90
2019	30	29	90
2020	27	27	90

Historical note: Over four seasons between 2015 and 2019, excluding 2017, the Survey collected data on the periods of storage, and the months of establishment and spreading of manure stored in field heaps. The results seen from these data were considered to be sufficiently indicative of the timings and use of outdoor manure storage that they provided adequate information without the need for continuing collection of these data. The results are available in the relevant previous editions of the Survey[11]

[11] https://www.gov.uk/government/collections/fertiliser-usage



D2 USE OF ORGANIC MANURES

Recent and current fertiliser recommendations are consistent in their advice to farmers to take note of the nutrient contributions from manures when calculating fertiliser input requirements. When making comparisons of the data presented in this report several factors should be considered:

- 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 required,
- for grassland, the average fertiliser rate has been used 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 D3). 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 2016 - 2020

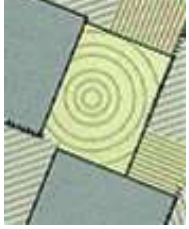
	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*bio-solids*	*other non-farm*
2016	16	8.3	0.7	0.4	0.8	0.9	1.1	0.2	0.8	0.5
2017	16	8.2	0.7	0.4	0.7	0.6	0.8	0.3	1.3	0.6
2018	17	8.9	0.6	0.2	0.6	0.7	1.4	0.1	1.2	1.3
2019	17	8.6	0.9	0.1	0.7	1.0	1.3	0.1	1.2	1.3
2020	15	8.3	0.7	0.2	0.6	0.9	1.1	0.1	1.6	1.3

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 2016 – 2020

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*bio-solids*	*other non-farm*
2016	57	30	2.4	1.6	3.0	3.2	3.9	0.7	3.0	1.8
2017	57	30	2.5	1.6	2.4	2.1	3.0	1.0	4.7	2.2
2018	57	30	2.1	0.6	2.0	2.2	4.6	0.4	4.0	4.3
2019	57	29	2.9	0.4	2.3	3.5	4.4	0.2	4.1	4.5
2020	55	30	2.5	0.6	2.0	3.1	3.9	0.2	5.6	4.5

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



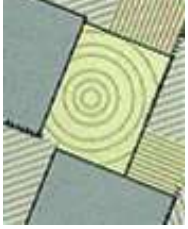
The percentage of the sown area receiving an application of cattle FYM in 2020 was 15%, which is slightly below the five-year average (16%). Cattle FYM and cattle slurry were applied to 85% of the sown area receiving organic manure in 2020 (Table D2.1b).

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 as rainwater or dirty water which affect the proportion of dry matter. The BSFP does not ask detailed questions on the animals producing manures or the nutrient analysis of any organic applications made, but it is possible to use typical values for different manure types to estimate the likely nutrient levels delivered. Details of these values are given in Table D2.2.

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

	dry matter (%)	*total N (kg/t; kg/m^3)*	*total P_2O_5 (kg/t; kg/m^3)*	*total K_2O (kg/t; kg/m^3)*
Cattle FYM	25	6.0	3.2	9.4
Pig FYM	25	7.0	6.0	8.0
Sheep FYM	25	7.0	3.2	8.0
Duck FYM	25	6.5	5.5	7.5
Layer hen manure	40	19	12	15
Poultry litter	60	28	17	21
Cattle slurry	6.0	2.6	1.2	2.5
Pig slurry	4.0	3.6	1.5	2.2
Biosolids: Digested cake	25	11	11	0.6
Biosolids: Thermally dried	95	40	55	2.0
Biosolids: Lime stabilised	25	8.5	7.0	0.8
Biosolids: Composted	40	11	10	3.0
Compost-green	60	7.5	3.0	6.8
Compost-green/food	60	11	4.9	8.0

[12]Anon. (2018). Nutrient Management Guide (RB209). Agriculture and Horticulture Development Board (AHDB). https://ahdb.org.uk/nutrient-management-guide-rb209



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 2020

	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 %	9.9	1.2	2.3	0.2	1.6	2.6	0.7	-	4.2	2.3
Treated area (ha)	212,450	25,794	49,094	4,980	33,581	56,338	14,966	-	90,724	50,060
Avg manure rate (t; m^3/ha)	21	28	20	36	8	6	16	-	21	30
Volume (Mt; Mm^3)	4.4	0.7	1.0	0.2	0.3	0.3	0.2	-	1.9	1.5
Fields in sample	265	27	33	10	19	36	13	0	38	39
Spring sown										
Treated area %	17.6	5.2	1.2	0.3	0.5	1.2	0.7	-	2.9	2.4
Treated area (ha)	401,953	118,031	26,839	6,150	12,216	27,316	17,103	-	65,763	54,019
Avg manure rate (t; m^3/ha)	23	27	29	20	7	11	25	-	23	22
Volume (Mt; Mm^3)	9.3	3.1	0.8	0.1	0.1	0.3	0.4	-	1.5	1.2
Fields in sample	476	92	30	6	11	24	26	0	23	39
Grass										
Treated area %	22.7	26.5	-	-	0.4	0.4	1.9	0.3	0.4	0.9
Treated area (ha)	1,304,990	1,520,311	-	-	23,567	21,491	109,688	15,139	20,757	54,009
Avg manure rate (t; m^3/ha)	16	28	-	-	5	5	13	21	23	23
Volume (Mt; Mm^3)	20.3	42.0	-	-	0.1	0.1	1.5	0.3	0.5	1.2
Fields in sample	723	499	1	4	21	13	61	6	9	27

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

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, whilst non-farm manures such as biosolids appear to be favoured on winter-sown tillage land it is notable that more was applied to spring-sown tillage and a small volume on grass in 2020 than in 2019. Overall, the profile of the % treated area and average manure rates are broadly similar to those reported for 2019.

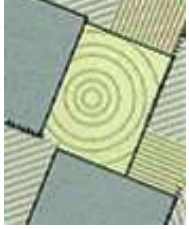


Table D2.3b Cattle FYM treated areas and average manure field application rates to winter-sown and spring-sown crops and grassland by farm type, Great Britain 2020

Cattle FYM	*Cereals*	*Dairy*	*General cropping*	*Mixed*	*Other livestock*	*All farm types*
Winter sown						
Treated area %	35.9	6.6	19.2	26.5	11.7	100.0
Treated area (ha)	76,292	14,099	40,835	56,323	24,901	212,450
Avg manure rate (t; m^3/ha)	20	22	21	21	21	21
Volume (Mt; Mm^3)	1.5	0.3	0.9	1.2	0.5	4.4
Fields in sample	71	30	35	80	49	265
Spring sown						
Treated area %	19.4	18.1	16.1	25.2	20.9	100.0
Treated area (ha)	78,180	72,873	64,900	101,481	84,080	401,953
Avg manure rate (t; m^3/ha)	25	26	20	21	23	23
Volume (Mt; Mm^3)	1.9	1.9	1.3	2.2	1.9	9.3
Fields in sample	63	96	65	106	145	476
Grass						
Treated area %	0.8	15.3	7.0	5.0	71.7	100.0
Treated area (ha)	10,279	200,082	91,713	64,866	935,946	1,304,990
Avg manure rate (t; m^3/ha)	19	18	14	17	15	16
Volume (Mt; Mm^3)	0.2	3.6	1.3	1.1	14.0	20.3
Fields in sample	10	93	29	38	550	723

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 D2.3b shows a breakdown of the cattle FYM applications by robust farm type. Cereal farms have the most extensive treatments of cattle FYM on winter sown crops at 35.9% of the treated area. On grass 71.7% of the area treated 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), or between February and April for spring-sown and grass fields, with treatments in the summer months (May to July) also important for the latter. When comparing percentage values of different manures, it is important to recognise the very different quantities involved, as indicated by the percentages of treated areas at the foot of the table.

Table D2.4 Percentage (%) of each organic manure type applied by sowing season and timing, Great Britain 2020

	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	1.3	0.0	11	0.0	13	23	1.6	0.0	13	5.4
September	7.8	0.3	47	1.1	10	22	3.1	0.0	36	8.1
October	1.4	0.7	4.8	0.0	4.5	1.2	2.6	0.0	1.8	1.7
Winter (Nov, Dec, Jan)	0.2	0.1	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0
Spring (Feb, Mar, Apr)	0.4	0.8	1.5	15	16.2	6.4	0.0	0.0	0.0	14
Summer (May, Jun, Jul)	0.1	0.0	0.0	10.2	4.8	0.5	0.0	0.0	0.9	3.0
Spring sown										
August	0.7	0.0	0.3	0.0	0.0	4.5	0.1	0.0	4.0	0.0
September	1.1	1.1	2.7	0.0	0	2.4	1.4	0.0	3.0	0.3
October	0.6	0.0	0.3	0.0	0.0	1.7	0.0	0.0	1.1	1.3
Winter (Nov, Dec, Jan)	1.4	0.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	5.5
Spring (Feb, Mar, Apr)	16	3.7	27	24.2	16	16	10.7	0.0	27.1	23
Summer (May, Jun, Jul)	1.3	1.2	0.6	8.5	1.2	1.7	0.2	0.0	1.9	3.3
Grass										
August	5.0	5.8	0.0	0.0	4.4	1.4	7.8	3.8	0.0	0.5
September	5.4	2.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.3
October	5.3	2.6	0.0	11.4	0.0	2.0	6	21.6	0.4	0.0
Winter (Nov, Dec, Jan)	4.9	7.4	0.0	0.0	6.1	0.9	5.3	21.6	3.6	0.0
Spring (Feb, Mar, Apr)	34	42	0.0	29.4	14.7	11.7	35	42	7.3	22
Summer (May, Jun, Jul)	13	32	1.2	0.0	8.8	4.4	22	11	0.4	11
% of total treated area	47	35	1.9	0.5	1.7	2.6	3.4	0.3	4.4	3.9

Figure D2.1 Percentage (%) treated GB areas receiving manure by manure type (3 year average 2018-2020) (an indication of relative quantities)

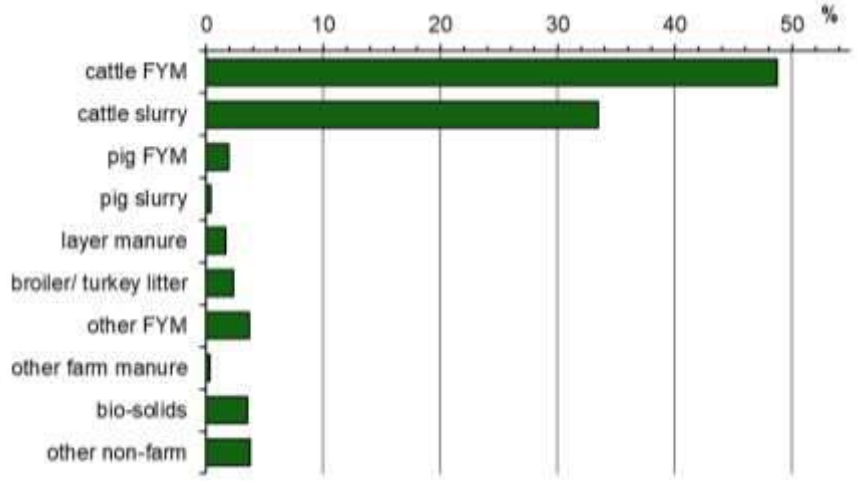


Figure D2.1 shows that cattle FYM and slurry form the overwhelming majority (82.2%) of British area of crops and grass receiving organic manures (3 year average 2018-2020).

Figure D2.2a Timings and applications of cattle FYM on GB winter and spring sown crops & grass (3 year average 2018-2020)

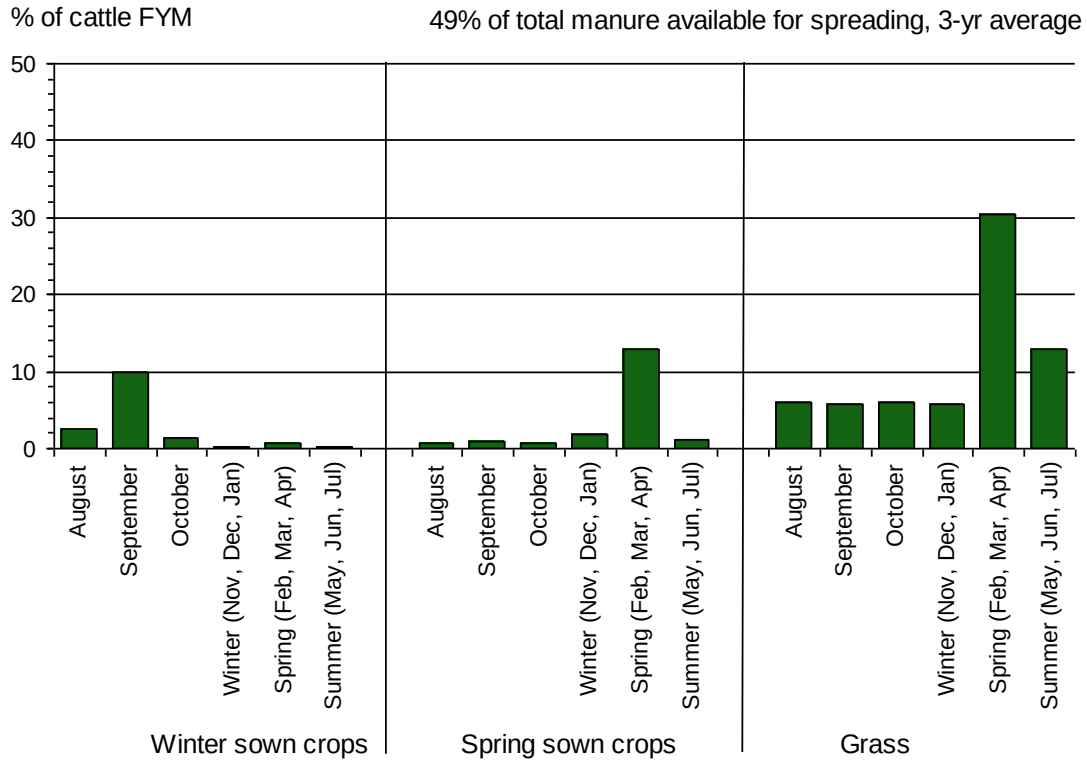


Figure D2.2b Timings and applications of cattle slurry on GB winter and spring sown crops & grass (3 year average 2018-2020)

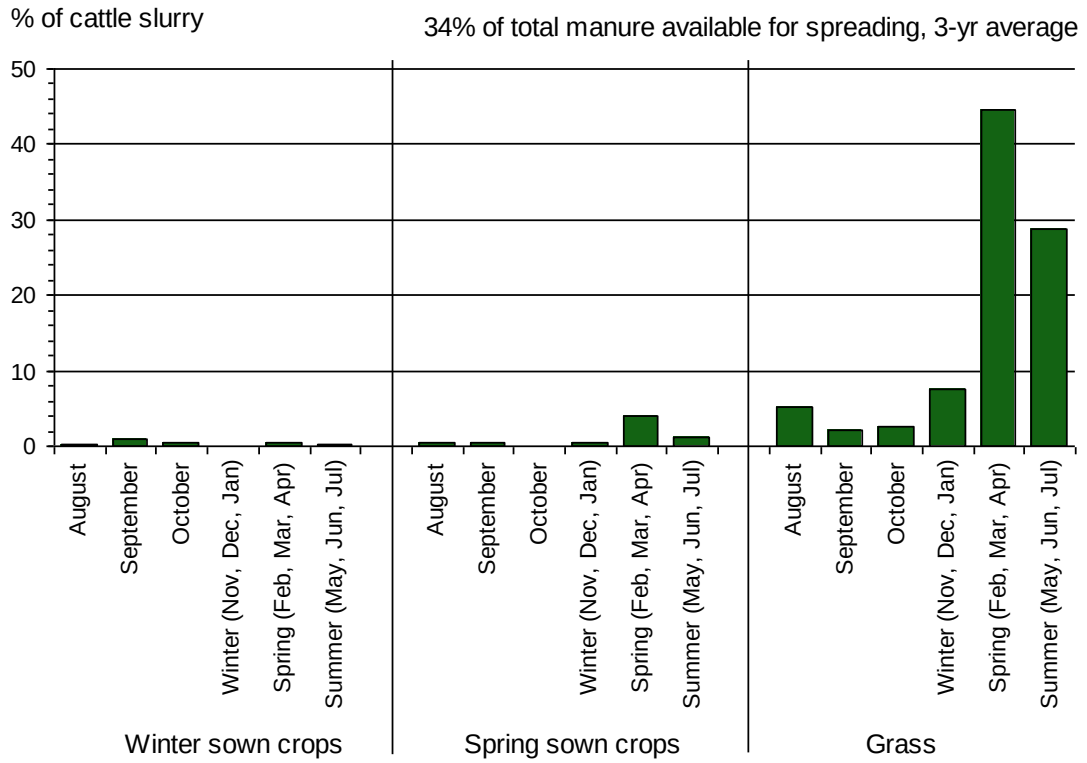


Figure D2.2c Timings and applications of pig FYM on GB winter and spring sown crops & grass (3 year average 2018-2020)

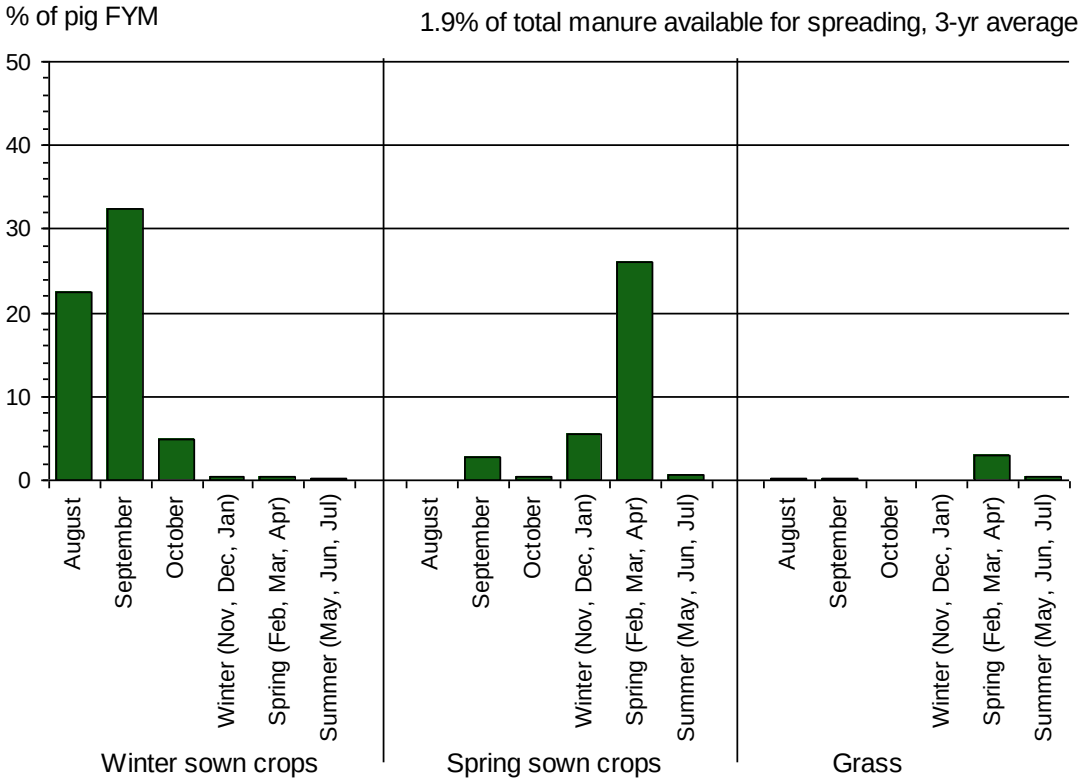
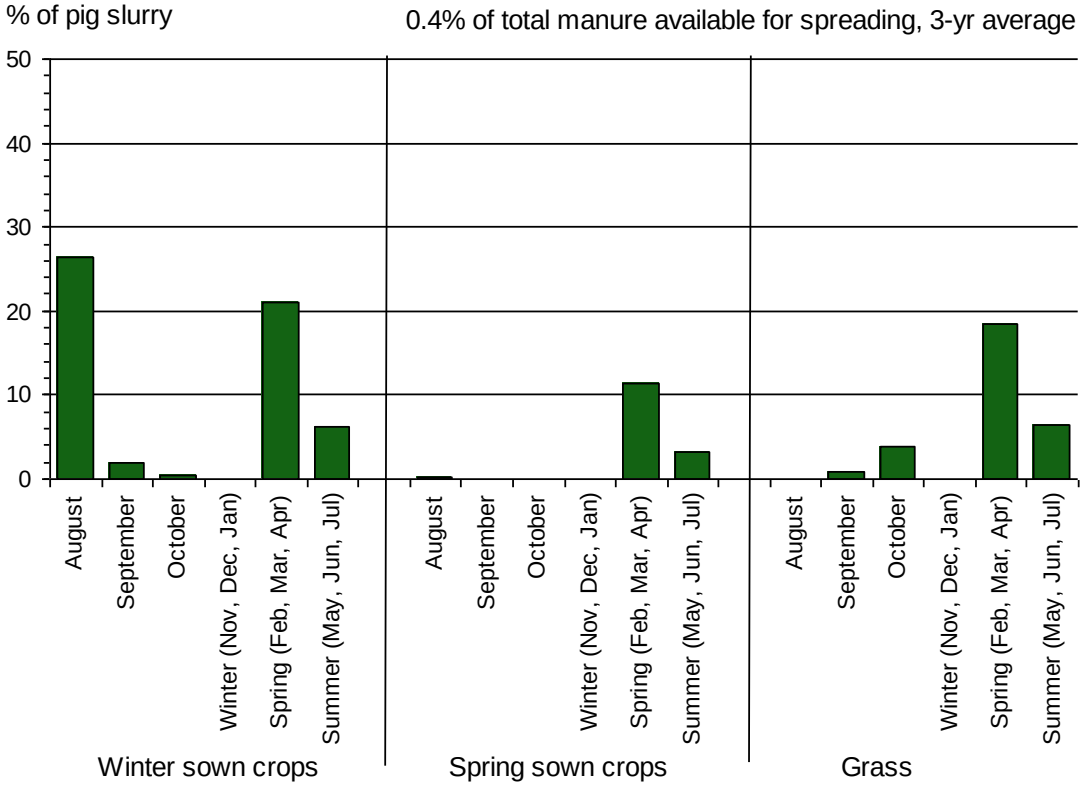


Figure D2.2d Timings and applications of pig slurry on GB winter and spring sown crops & grass (3 year average 2018-2020)



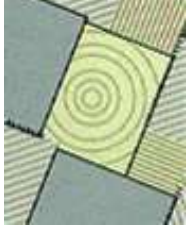


Figure D2.2e Timings and applications of layer manure on GB winter and spring sown crops & grass (3 year average 2018-2020)

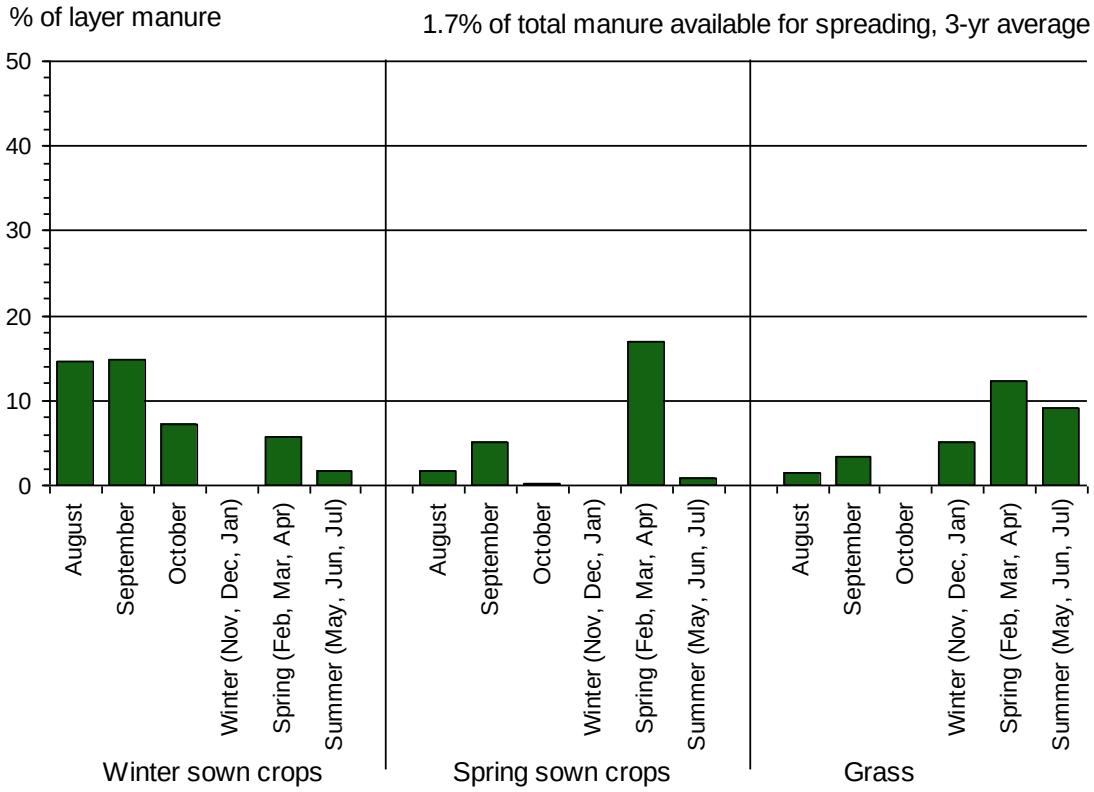
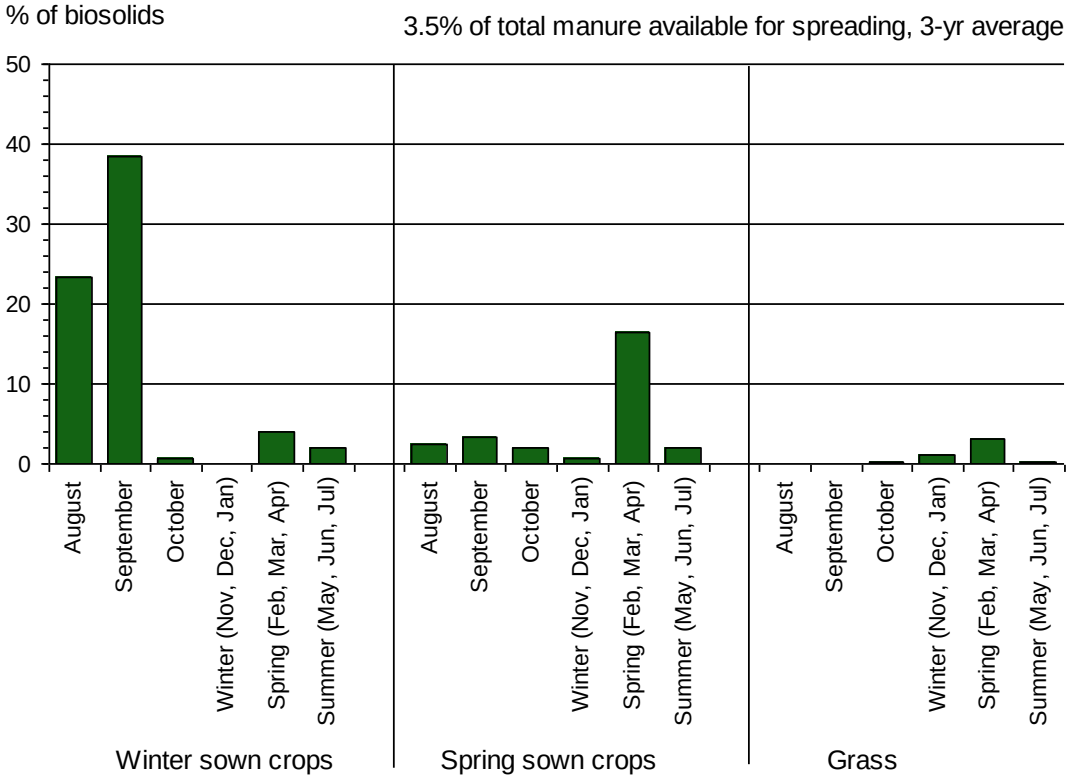
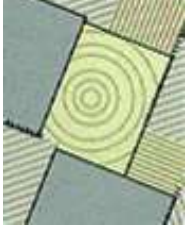
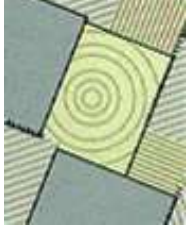


Figure D2.2f Timings and applications of biosolids on GB winter and spring sown crops & grass (3 year average 2018-2020)





Figures D2.2a-f are derived from the 3-year average of the GB data presented in Table D2.4 in 2018 to 2020. The proportions of each of these manure types spread onto the winter-sown and spring-sown crops and onto grassland crop groups are shown, together with the timings of applications. It is important to note that the actual quantities of each manure available for spreading varies very significantly between manure types as illustrated in Figure D2.1; the proportion of the total available manure represented by each type is shown on the individual Figure D2.2 charts. The representation of the patterns of spreading of each manure type in this way is designed to facilitate the interpretation of the data in Table D2.4.



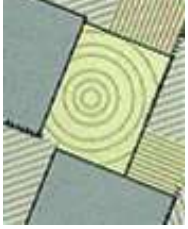
D3 FERTILISER VALUE OF ORGANIC MANURES

Organic manures are valuable sources of the major plant nutrients nitrogen, phosphorus, and potassium and, where used, applications of manufactured fertiliser can theoretically be reduced[13]. In the Survey, farmers were not asked directly whether they had made an adjustment to fertiliser inputs because of manure use. However, an indication of possible adjustments has been derived by comparing fields that received manure with those that did not. Organic fields, which use no mineral fertilisers, have been excluded from these comparisons, since they would distort the influence of manures on mineral application rates. Table D3.1a shows the dressing cover, average field rate and overall fertiliser rates for the main tillage crops in Great Britain, with and without manure inputs.

Table D3.1a Dressing cover (%) and application rates (kg/ha) of manufactured fertiliser to tillage crops in Great Britain, with and without applications of organic manure, 2020

	nitrogen		*phosphate*		*potash*		*fields in sample*	
dressing cover (%)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	100	100	41	46	45	47	239	697
Spring barley	97	100	49	54	50	50	253	630
Winter barley	97	100	49	53	55	58	109	276
Potatoes (maincrop)	100	93	75	91	100	90	17	30
Sugar beet	100	96	40	59	33	74	30	53
Winter oilseed rape	99	99	26	58	30	48	68	227
	nitrogen		*phosphate*		*potash*		*fields in sample*	
average field rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	170	182	48	56	53	66	239	697
Spring barley	88	106	45	48	51	62	253	630
Winter barley	136	143	50	50	66	67	109	276
Potatoes (maincrop)	123	131	105	108	152	176	17	30
Sugar beet	82	64	51	39	75	75	30	53
Winter oilseed rape	142	182	50	55	57	61	68	227
	nitrogen		*phosphate*		*potash*		*fields in sample*	
overall application rate (kg/ha)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	170	181	20	26	24	31	239	697
Spring barley	85	106	22	26	26	31	253	630
Winter barley	132	143	24	27	36	39	109	276
Potatoes (maincrop)	123	122	78	98	152	159	17	30
Sugar beet	82	62	21	23	25	56	30	53
Winter oilseed rape	141	180	13	32	17	29	68	227

[13]Anon. (2018). Nutrient Management Guide (RB209). Agriculture and Horticulture Development Board (AHDB). https://ahdb.org.uk/nutrient-management-guide-rb209

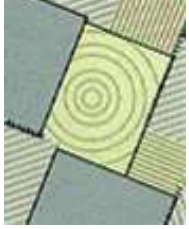


For all the major tillage crops, except sugar beet, the overall rate of nitrogen from manufactured mineral fertiliser was higher on fields where organic manures were not applied in 2020. The difference in overall nitrogen application rates, with and without manure, ranged from 11 kg/ha for winter wheat and winter barley, to 21 and 39 kg/ha for spring barley and oilseed rape, respectively. The data for potatoes and sugar beet should be treated with caution as these are derived from a small number of fields. 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 in the report.

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, 2016 - 2020

	2016		*2017*		*2018*		*2019*		*2020*	
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	177	193	175	191	170	193	170	191	170	181
Spring barley	93	112	92	106	94	106	83	102	85	106
Winter barley	135	150	128	155	125	149	124	150	132	143
Potatoes (maincrop)	124	140	137	136	141	145	159	146	123	122
Sugar beet	93	100	80	103	83	80	76	74	82	62
Winter oilseed rape	153	187	164	184	174	193	162	186	141	180
	2016		*2017*		*2018*		*2019*		*2020*	
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	16	30	15	33	14	30	12	28	20	26
Spring barley	30	34	32	33	32	32	27	32	22	26
Winter barley	19	32	27	31	20	29	20	29	24	27
Potatoes (maincrop)	124	100	127	110	81	110	104	79	78	98
Sugar beet	-	23	11	22	13	21	12	21	21	23
Winter oilseed rape	11	34	20	37	12	32	15	34	13	32
	2016		*2017*		*2018*		*2019*		*2020*	
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	24	35	25	39	19	35	20	34	24	31
Spring barley	46	47	46	43	46	42	38	40	26	31
Winter barley	23	46	39	40	25	37	30	39	36	39
Potatoes (maincrop)	191	182	213	204	212	207	175	158	152	159
Sugar beet	64	42	43	49	36	51	45	53	25	56
Winter oilseed rape	13	33	22	33	15	30	12	31	17	29

Differences in overall application rates with and without manures for nitrogen, phosphate, and potash for the period 2016 to 2020 are shown in table D3.1b above. The application of lower rates on manured fields holds true for nitrogen for all major combinable crops throughout the period. The lower rates are most noticeable for spring barley at 16% on average for the period, with winter oilseed rape at 15%, winter barley at 14% and the differential for winter wheat being 9% less on manured fields. Overall rates for phosphate and potash in winter wheat show a similar relationship over the five-year period, respectively at 47% and 35% lower rates on manured fields. Other crops show greater variability between manured and unmanured field rates for the different nutrients which may in part be due to the smaller 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 some grass fields 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 2020

	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 *	86	140	-	45	-	62	16	79
Grass 5 years and over *	144	89	-	32	-	48	13	241
All grass	118	105	-	36	-	54	29	320
Dairy								
Grass under 5 years old	164	171	24	38	47	60	114	48
Grass 5 years and over	156	127	24	25	40	30	174	95
All grass	159	137	24	28	43	38	288	143
General cropping								
Grass under 5 years old *	176	130	-	40	51	59	14	72
Grass 5 years and over *	167	93	-	22	-	41	24	147
All grass	169	102	46	27	54	45	38	219
Mixed								
Grass under 5 years old *	99	118	28	45	39	67	42	119
Grass 5 years and over *	62	72	22	19	29	24	36	197
All grass	80	85	25	26	34	36	78	316
Other livestock								
Grass under 5 years old	103	89	28	26	41	35	195	177
Grass 5 years and over	75	64	19	18	25	21	545	724
All grass	80	68	20	19	28	23	740	901
All farm types								
Grass under 5 years old	134	116	26	34	43	49	383	497
Grass 5 years and over	102	76	21	19	29	24	794	1412
All grass	111	84	22	22	33	29	1177	1909

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 16 fields).

As in the previous four years, 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. Rates of phosphate and potash on grass under 5 years old were the exception. Mineral fertiliser rates were consistently higher on short term grass than permanent grassland. The data for certain robust groups, notably cereals, general cropping and mixed farms are derived from relatively few fields, so need to be treated with due caution.

As so many fields on dairy farms receive manure, a separate analysis was carried out to examine the influence of grass management (Table D3.3a). All grazing land also receives manure, it is just that it is not applied as a dressing in our context.

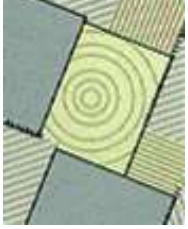


Table D3.3a Average field rates (kg/ha) of manufactured fertiliser application on dairy grassland with and without applications of organic manure, Great Britain 2020

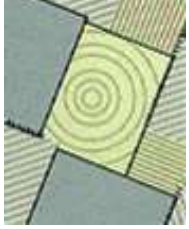
	nitrogen (kg/ha)		*phosphate (kg/ha)*		*potash (kg/ha)*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
All cut for hay	104	72	-	18	-	31	13	13
All cut for silage	171	181	27	36	51	57	203	38
All grazings	154	137	23	27	41	37	236	135

Application rates of mineral fertilisers are generally higher for grass to be cut for silage. Average field rates on grazed grass are 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 2016 – 2020

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*
2016	106	-	13	-	15	-	15	3
2017	123	89	-	-	-	-	11	11
2018	132	83	33	-	38	-	19	16
2019	117	83	-	20	-	24	16	15
2020	104	72	-	18	-	31	13	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*
2016	159	170	28	30	54	69	196	51
2017	163	137	24	16	56	32	199	28
2018	153	135	26	20	46	37	201	45
2019	150	156	25	33	46	62	226	27
2020	171	181	27	36	51	57	203	38
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*
2016	150	144	27	25	44	41	245	135
2017	155	136	24	19	46	25	211	122
2018	138	111	24	19	37	22	230	162
2019	136	120	24	19	42	29	257	126
2020	154	137	23	27	41	37	236	135

Over the 5-year period 2016-20, mineral fertiliser application rates, whilst variable, are higher for grass cut for silage than other grass management systems. Data for grass cut for hay should be treated with caution as the number of fields managed this way is low. It is notable that the average field rates for phosphate and potash on unmanured fields of grass cut for silage have recovered from the relatively low rates recorded in 2017 and 2018.



SECTION E

SPREADING PRECISION, RECORD KEEPING, SOIL TESTING, UREASE INHIBITOR USE, AND THE IMPACT OF COVID-19

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 2020, 49% 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 6%, checking at each change of fertiliser. Seventeen percent of farmers never check their spreaders for accuracy and a further 4% of farmers considered that spreader accuracy did not need to be checked.

Table E1.1 Frequency of solid fertiliser spread pattern checks using catch trays, percentage (%) of those farms with a spreader, Great Britain 2016 – 2020

	All Farms		***Farms with a spreader***					
	No spreader	*Contract applied*	*Factory set & doesn't need checking*	*At each change of fertiliser type*	*Less than once a year*	*Once a year*	*Never checked*	*Other*
2016	14	12	9	6	16	41	26	1
2017	13	11	7	6	16	44	26	1
2018	13	9	5	5	20	45	23	2
2019	13	12	5	6	18	50	19	1
2020	16	13	4	6	22	49	17	2

Practices of checking are generally consistent over the five-year period 2016-2020, but there is an indication of a trend that fewer farmers never check their spreaders. Contractors were used on 13% of GB 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 2019/20 crop year, Great Britain 2020

	manufactured fertilisers				*organic manures*			
	farms	*farms %*	*area (ha)*	*area %*	*farms*	*farms %*	*area (ha)*	*area %*
Computer program	20,057	28.5	3,695,240	41.5	10,948	20.5	2,264,540	33.2
Farm diary	31,716	45.1	3,931,046	44.1	28,447	53.2	3,517,050	51.5
Farm notebook/pocketbook	10,857	15.4	1,252,654	14.1	8,075	15.1	950,143	13.9
File record sheet (file in office)	17,833	25.4	1,933,071	21.7	12,995	24.3	1,561,530	22.9
Other paper record	3,296	4.7	372,109	4.2	2,822	5.3	357,384	5.2
No records kept	2,245	3.1	188,053	2.1	3,904	6.8	344,466	4.8

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 29% of farms, representing 42% in area terms. No records were kept on 3% of farms and this figure falls to 2% when considered on an area basis. Computerised record keeping is slightly less common for organic manures on 21% 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 ‘cereals’ farms at 50%, and lower at 17% on ‘dairy’ and 11% on ‘other livestock’ farms, where a higher proportion use farm diaries. Farms of all types favour diaries for recording applications of organic manures. The method of record keeping for ‘all farm types’ is broadly similar for both manufactured and organic fertilisers.

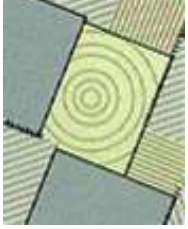


Table E1.2b Record keeping methods for fertiliser and manure applications on farms where each nutrient type was applied during the 2019/20 crop year, by farm type, Great Britain 2020

	manufactured fertilisers		*organic manures*	
Cereals	*farms*	*farms %*	*farms*	*farms %*
Computer program	9,223	50.3	3,687	47.0
Farm diary	5,538	30.2	2,914	37.1
Farm notebook/pocketbook	2,500	13.6	1,005	12.8
File record sheet (file in the office)	4,985	27.2	1,781	22.7
Other paper record	983	5.4	654	8.3
No records kept	0	0.0	355	4.3
	manufactured fertilisers		*organic manures*	
Dairy	*farms*	*farms %*	*farms*	*farms %*
Computer program	1,130	16.9	1,210	16.2
Farm diary	3,455	51.6	3,872	51.9
Farm notebook/pocketbook	949	14.2	949	12.7
File record sheet (file in the office)	2,422	36.2	2,823	37.8
Other paper record	113	1.7	113	1.5
No records kept	348	4.9	511	6.4
	manufactured fertilisers		*organic manures*	
General cropping	*farms*	*farms %*	*farms*	*farms %*
Computer program	4,109	46.6	1,955	37.2
Farm diary	3,579	40.6	2,768	52.7
Farm notebook/pocketbook	1,188	13.5	591	11.3
File record sheet (file in the office)	2,208	25.0	1,352	25.7
Other paper record	320	3.6	190	3.6
No records kept	221	2.4	42	0.8
	manufactured fertilisers		*organic manures*	
Mixed	*farms*	*farms %*	*farms*	*farms %*
Computer program	2,341	30.6	1,554	24.0
Farm diary	3,518	46.0	3,385	52.3
Farm notebook/pocketbook	862	11.3	891	13.8
File record sheet (file in the office)	1,849	24.2	1,500	23.2
Other paper record	384	5.0	384	5.9
No records kept	305	3.8	349	5.1
	manufactured fertilisers		*organic manures*	
Other livestock	*farms*	*farms %*	*farms*	*farms %*
Computer program	2,951	10.5	2,239	8.6
Farm diary	15,444	54.7	15,327	58.8
Farm notebook/pocketbook	5,122	18.1	4,583	17.6
File record sheet (file in the office)	6,368	22.6	5,539	21.3
Other paper record	1,495	5.3	1,481	5.7
No records kept	1,315	4.5	2,591	9.0
	manufactured fertilisers		*organic manures*	
All farm types	*farms*	*farms %*	*farms*	*farms %*
Computer program	20,057	28.5	10,948	20.5
Farm diary	31,716	45.1	28,447	53.2
Farm notebook/pocketbook	10,857	15.4	8,075	15.1
File record sheet (file in the office)	17,833	25.4	12,995	24.3
Other paper record	3,296	4.7	2,822	5.3
No records kept	2,245	3.1	3,904	6.8

Note: more than one method may be used.

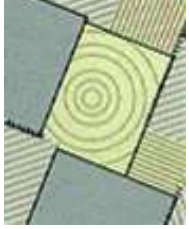


Table E1.2c Record keeping methods percentage (%) of farms, for fertiliser and manure applications on farms where each respective nutrient type was applied in the crop year, Great Britain 2016-2020

		computer program	*farm diary*	*farm notebook/pocket-book*	*file record sheet (file in the office)*	*other paper record*	*no records kept*
manufactured fertilisers	*2016*	23.3	52.6	22.4	20.7	3.0	4.3
	2017	22.6	49.7	24.0	21.7	2.1	4.1
	2018	25.1	54.5	18.2	17.8	5.2	2.1
	2019	28.7	54.9	17.2	20.6	2.8	3.8
	2020	28.5	45.1	15.4	25.4	4.7	3.1
organic manures	*2016*	15.4	60.0	21.8	17.0	3.4	9.9
	2017	16.7	55.8	23.8	18.9	2.7	8.3
	2018	17.9	59.8	16.6	15.8	5.5	5.6
	2019	19.8	60.7	18.0	19.2	2.9	4.8
	2020	20.5	53.2	15.1	24.3	5.3	6.8

Note: more than one method may be used.

Recording methods for manufactured fertilisers show some variations across the five-year period 2016-2020, with farm diaries remaining the most widely used recording method. For organic manures, records of some type were kept on 90-95% of farms for the five-year period.

Table E1.3 Soil testing percentage (%) of tillage and grass area, Great Britain 2016 - 2020

	tillage area %				*grass area %*			
	Standard P, K, Mg, pH	*Nitrogen*	*pH (lime only)*	*Precision Farming purposes*	*Standard P, K, Mg, pH*	*Nitrogen*	*pH (lime only)*	*Precision Farming purposes*
2016	24	9	8	5	6	2	3	1
2017	27	11	7	6	6	1	3	1
2018	26	11	7	7	7	2	3	1
2019	29	15	8	7	7	2	4	2
2020	29	15	7	7	6	2	2	1

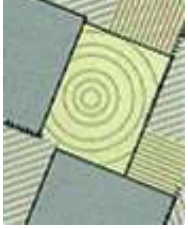
Table E1.3 shows the percentage of the tillage and grass area that was soil tested for the cropping years 2016–2020. It is usual practice, especially for tillage fields, to test a sub-set of them in any given year. Standard P, K, Mg, pH was the most commonly used soil test for the period, with an average of 27% of the tillage area and 6% of the grass area. All types of soil tests were more prevalent on tillage than on grass.

Table E1.4 Use (% weighted area) of urea-containing nitrogen fertiliser with a urease inhibitor on tillage or grass fields, Great Britain 2018 – 2020

	Product contains a urease inhibitor	*Product does not contain a urease inhibitor*	*Don't know**
2018	6	94	-
2019	6	70	24
2020	10	70	21

* 'Don't know' was not a response category in 2018.

Table E1.4 shows the use of liquid urea ammonium nitrate (UAN) or solid urea (straight nitrogen or nitrogen+sulphur) fertiliser products containing urease inhibitors, which reduce gaseous losses of ammonia (a known air pollutant). Measured in terms of weighted area (%), there was a 4% increase in the use of urease inhibitor containing fertilisers in 2020 to 10%. There is also some evidence from the 'don't know' responses that awareness of products containing urease inhibitors is increasing.



At the time the 2020 survey was being prepared there were huge uncertainties over the impacts Covid-19 might have on the supply chain for food and farming. So two additional questions were included to seek to capture the scale of any impacts.

The results indicate that Covid-19 made little difference in terms of access to fertiliser inputs (82% farms, 84% area) or crop protection products (78% farms, 81% area). A further 4-5% of farms reported some minor delivery delays. (Table E1.5).

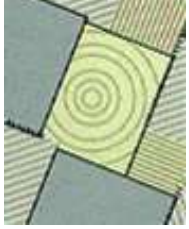
Table E1.5 Fertiliser and crop protection access between March and May 2020, Great Britain 2020

	Fertiliser		*Crop Protection*	
	% holdings	*% area*	*% holdings*	*% area*
Covid-19 made no difference and everything arrived in time	82	84	78	81
It caused some minor delivery delays	5	6	4	5
It caused signficant delays that affected application timings	1	1	0	1
I could not source what I needed	0	0	0	0
Do not use this type of input	10	7	13	9
No answer	2	2	4	4
Don't know	0	0	0	0
Total	100	100	100	100

Table E1.6 shows how farmers assessed the state of the supply chain for all farm inputs they needed after May 2020 to end of the season. Over 90% of farms (93% by area) reported that Covid-19 had no to only very minor effects on deliveries or timings, with only 4% of farms (4% by area) reporting significant delays or not able to access the inputs they needed.

Table E1.6 Input supply chain after May for the 2020 season, Great Britain 2020

	% holdings	*% area*
Deliveries and timings were as normal	80	76
Covid-19 continued to cause some minor delivery delays	13	17
It was still causing significant delays that affected operational timings	2	3
I could not source what I needed	2	1
No answer	4	3
Don't know	0	0
Total	100	100



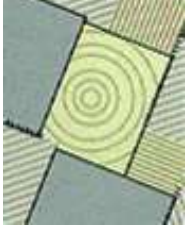
APPENDIX 1 - SURVEY STATISTICS

APP 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2020

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	2.6	2.8	1.1	1.3	1.6	1.7	2.4	2.4	4.6	1.6	1.9	1.8	947
oilseed rape	3.7	3.6	1.2	1.9	2.2	3.1	3.6	3.5	2.4	2.0	2.7	3.0	317
winter barley	2.7	3.1	1.4	1.6	2.3	2.0	2.5	2.6	4.5	1.7	2.4	2.1	388
spring barley	1.6	2.0	1.3	1.1	1.4	1.3	1.5	1.6	1.9	1.3	1.7	1.8	905
m/c potatoes	12.2	10.2	10.7	11.5	17.6	10.0	11.0	16.0	10.1	10.9	16.3	32.2	50
sugar beet	4.4	4.7	2.6	3.5	6.4	5.1	4.3	4.2	5.2	4.4	7.5	6.0	83
all tillage crops	1.8	2.1	0.9	0.9	1.1	1.0	1.8	1.9	1.5	1.0	1.5	1.4	4024
all grass	1.8	1.6	1.0	0.4	0.6	0.5	2.0	2.6	1.7	0.9	1.4	1.8	3345
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	2.7	2.9	1.1	1.4	1.6	1.7	2.5	2.5	5.5	1.7	2.1	1.9	883
oilseed rape	3.8	3.8	1.1	2.0	2.2	3.2	3.7	3.6	2.7	2.2	3.0	3.1	292
winter barley	2.9	3.4	1.5	1.7	2.4	2.2	2.7	2.7	5.9	1.9	2.8	2.4	339
spring barley	1.8	2.2	1.3	1.2	1.5	1.4	1.7	1.7	2.7	1.6	2.1	2.0	722
m/c potatoes	12.5	10.8	11.0	12.0	17.9	10.7	11.2	17.1	10.4	11.5	16.7	35.5	47
sugar beet	4.4	4.7	2.6	3.5	6.5	5.1	4.3	4.2	5.4	4.5	7.5	6.0	82
all tillage crops	2.0	2.3	0.9	0.9	1.2	1.1	1.9	2.0	1.9	1.2	1.8	1.5	3563
all grass	2.1	1.9	1.1	0.4	0.6	0.5	2.3	2.9	2.0	1.2	1.7	2.1	2741
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	9.2	8.5	5.1	4.2	6.0	6.2	8.5	8.1	7.8	3.8	5.5	6.4	64
oilseed rape	13.0	10.0	5.4	5.9	6.6	9.9	13.0	10.0	5.7	4.6	4.9	9.9	25
winter barley	6.3	7.2	4.2	4.1	5.4	4.5	6.3	7.1	5.4	3.4	4.3	4.0	49
spring barley	3.2	3.8	2.9	2.2	2.9	2.7	2.9	3.4	2.6	1.8	2.4	3.9	183
all potatoes	23.1	6.2	22.3	21.7	40.0	3.1	23.1	0.0	22.3	21.7	34.9	0.0	8
all tillage crops	4.2	4.4	2.6	2.0	2.7	2.2	3.9	4.3	2.4	1.8	2.5	3.2	461
all grass	3.6	2.6	2.8	0.9	1.5	0.9	3.3	5.2	2.8	1.2	2.3	2.6	604

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 2020

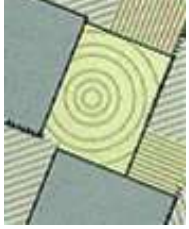
	2020	*% total*
Target sample	1500	100
2019 panellists agreeing to re-contact in 2020	1264	84
Achieved 'Main' sample from 2019 panel	1028	69
Achieved additional 'Main' sample	104	7
Achieved '1st reserve' sample	118	8
Achieved '2nd reserve' sample	51	3
Achieved '3rd reserve' sample	35	2
Total achieved	**1336**	**89**
Total number of refusals/non-contact	1313	
Total number of farms approached	***2649***	

Table App 1.3 Response to main and reserve samples for 2016 - 2020

Net response rate	*2016 %*	*2017 %*	*2018 %*	*2019 %*	*2020 %*
Overall achieved rate	87	89	87	88	89
Achieved % of total contact attempts	46	45	42	48	50
Main sample	80	77	76	85	85
Reserve sample(s)	20	23	24	15	15
Main reason for refusal	*2016 %*	*2017 %*	*2018 %*	*2019 %*	*2020 %*
Too busy	10	11	11	11	9
Not interested	12	13	16	13	10
Do not do surveys	5	6	6	6	3
Want payment	0	0	1	0	0
Too much paperwork	1	1	1	0	0
Non-contact	45	50	43	44	57
Other[a]	20	22	25	22	21

[a] includes answerphone/screening, contracted out, contributed enough, farm sold/not farming, ill health, retired, and wrong telephone number.

Farms in the >200ha size band are oversampled by 25%, which has the effect of increasing response rates.

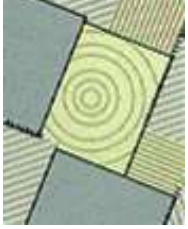


APP 1.3 INFORMATION ON HOLDINGS BELOW 20 HECTARES

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. Although in recent years the total number of farms in Great Britain has been nearly 200,000, many of these are relatively small. Holdings below 20 hectares accounted for about 4% of the total crop area and around 9% of the total grass area. Further detailed information for Great Britain is provided in the table below on the equivalent crop or grassland areas and number of holdings for those holdings where the total size of the farm is below 20 hectares. It should be noted that 2018 was the latest available year of data from the June Survey of Agriculture when designing the sample for the 2020 Survey.

June 2018	Total GB area (ha)	Total no. of GB holdings with area >0 ha	Area on GB holdings of <20ha	No. of GB holdings with <20ha	Proportion of GB area on holdings <20ha	Proportion of GB holdings with <20ha	No. of GB holdings with zero area	Total no. of GB holdings
Total croppable area[a]	5,893,938	83,949	234,671	37,204	4%	44%	112,235	196,184
of which crops	4,886,496	65,482	187,418	28,282	4%	43%	130,702	196,184
of which temporary grass < 5 years old	1,007,442	50,976	242,563	35,960	24%	71%	145,208	196,184
Total grass	6,522,099	167,110	593,047	95,680	9%	57%	29,074	196,184
grass < 5 years old	1,007,442	50,976	242,563	35,960	24%	71%	145,208	196,184
grass ≥ 5 years old	5,514,657	162,675	600,217	99,097	11%	61%	33,509	196,184

[(a)] includes bare fallow land

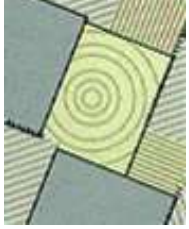


APPENDIX 2

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.