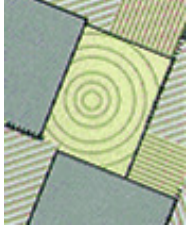
THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2009



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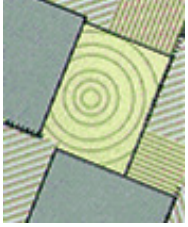

FOREWORD

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

The 2009 Survey was sponsored by the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Government, Rural and Environment Research and Analysis Directorate (SG-RERAD). 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 2009, the Survey was co-ordinated by **dmr**kynetec Ltd., who was responsible for the survey design, data collection, statistical analysis and quality control monitoring.

March 2010

ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2009 British Survey of Fertiliser Practice.

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

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

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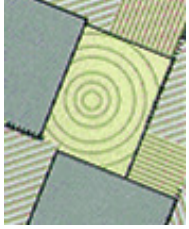

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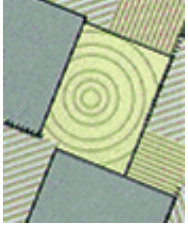

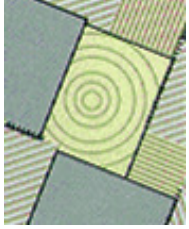

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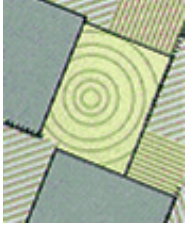
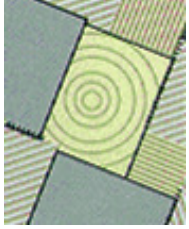




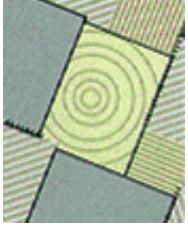
EXECUTIVE SUMMARY

The British Survey of Fertiliser Practice is an annual, nationally representative survey based on the selection of a random stratified sample of farms from mainland Britain. In 2009, responses from 1,373 farms were obtained. The main purpose of the survey is to estimate average application rates of nitrogen, phosphate and potash used for agricultural crops and grassland. Information is also collected on applications of sulphur fertilisers, organic manures and lime.

The main findings from the 2009 Survey on the use of each fertiliser nutrient in Great Britain are summarised below (Table ES1). Weather and economic factors which may have contributed to recorded changes in fertiliser use during the 2008/2009 cropping season are also discussed in the report.

Table ES1 Nutrient dressing cover, current and five year mean overall application rates for all crops and grass, Great Britain 2009

	All Tillage	All Grass	All Crops and Grass
Total Nitrogen			
Overall application rate, 2009 (kg/ha)	139	57	97
Mean overall application rate, 2005-2009 (kg/ha)	145	65	103
Crop area receiving dressing, 2009 (%)	90	59	74
Straight Nitrogen			
Overall application rate, 2009 (kg/ha)	125	28	75
Mean overall application rate, 2005-2009 (kg/ha)	128	27	74
Crop area receiving dressing, 2009 (%)	81	28	53
Compound Nitrogen			
Overall application rate, 2009 (kg/ha)	14	29	22
Mean overall application rate, 2005-2009 (kg/ha)	17	38	28
Crop area receiving dressing, 2009 (%)	21	39	30
Total Phosphate			
Overall application rate, 2009 (kg/ha)	23	9	15
Mean overall application rate, 2005-2009 (kg/ha)	33	13	22
Crop area receiving dressing, 2009 (%)	40	38	39
Total Potash			
Overall application rate, 2009 (kg/ha)	33	12	22
Mean overall application rate, 2005-2009 (kg/ha)	45	17	30
Crop area receiving dressing, 2009 (%)	43	39	41
Total Sulphur			
Overall application rate, 2009 (kg/ha)	19	2	10
Mean overall application rate, 2005-2009 (kg/ha)	22	2	11
Crop area receiving dressing, 2009 (%)	35	5	20



Nitrogen

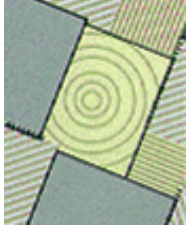
- The total nitrogen application rates on all crops and grassland increased by 2 kg/ha between 2008 and 2009. Total nitrogen applied on tillage crops fell by 1 kg/ha and increased by 2 kg/ha on grassland. The rise in the application rate on grassland is the first annual increase since 1997, although the level is consistent with the declining long term trend (after a large fall in the rate in 2008). The rate on all tillage has remained relatively constant for the last 25 years.
- There were increases in the overall application rate of nitrogen in 2009 on all the major tillage crops (returning to 2007 levels) except oilseed rape, where the rate declined by 6 kg/ha in 2009. The increases in the rate applied to tillage crops did not lead to an increase in the rate across all tillage because of changes in the crop mix (primarily a fall in the area of wheat and a substantial increase in the area of peas and beans). The proportion of crop area (for tillage crops) receiving a straight nitrogen application increased 1% since 2008. Overall rates of compound nitrogen applied in 2009 decreased by 2-8 kg/ha since 2008 in major tillage crops, the exception being potatoes where the rate increased by 4 kg/ha. However, reductions in compound nitrogen rates do not compensate for the increase in straight nitrogen applied.
- The 2 kg/ha increase in overall total nitrogen rate on grassland was caused by a higher dressing cover and an increased average field application rate of straight N. A slight reduction in dressing cover and a lower average field rate of compound N were also seen, resulting in overall total N rate of 57 kg/ha for grassland in 2009.

Phosphate

- Overall phosphate use on tillage crops and grassland in 2009 fell compared to last year (by 8 kg/ha to 23 kg/ha and by 1 kg/ha to 9 kg/ha respectively), making the 2009 overall rates the lowest since the survey began (and around half of the overall rates recorded at its inception in the early 1980s). This is due to a combination of decreased average application rates on both tillage and grassland and a reduction in the proportion of land receiving a phosphate dressing. In 2009, just 40% of all tillage crops and 38% of grassland received a phosphate application, bringing the five year means down to 53% and 48%, respectively.
- Overall phosphate use on tillage crops has gradually declined since 1983, with five-year means of 58 kg/ha in 1983-87, 54 kg/ha in 1988-92, 53 kg/ha in 1993-97, 46 kg/ha in 1998-02, 38 kg/ha in 2003-07 and 33 kg/ha for the period 2005-09. For grassland, the five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-92, 23 kg/ha in 1993-97, 20 kg/ha in 1998-02, 16 kg/ha in 2003-07 and 13 kg/ha for the period 2005-09.

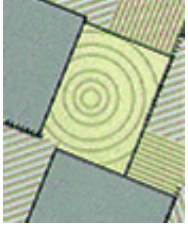
Potash

- The proportion of the area of tillage crops receiving a potash dressing decreased from 55% in 2008 to 43% in 2009. This combined with slightly reduced average field rate of potash in 2009 (77 kg/ha) meant the overall rate decreased by 10 kg/ha compared to last year. The overall rate on grassland fell by 1 kg/ha as a result of lower average rates and a reduction in the area receiving a dressing. Overall application rates of potash on both tillage and grassland are currently at their lowest level since this data set started in 1983.
- Overall potash use on tillage crops has declined since 1983 albeit gradually at first, with five-year means of 64 kg/ha in 1983-87, 63 kg/ha in 1998-92, 62 kg/ha in 1993-97, 57 kg/ha in1998-02, 52kg/ha in 2003-07 and 45 kg/ha in 2005-09. The pattern of overall potash use on grassland has been more variable compared to tillage crops, but also shows a net decline between 1983 and 2009. Overall potash rates were relatively stable at 31-33 kg/ha during the mid 1980s - early 1990s but, since then, have tended to decline despite occasional year-on-year increases being recorded.



Sulphur

- The Survey has collected detailed information on sulphur fertiliser use since 1993, when only 3-6% of the cereal crop areas and 8% of the oilseed rape area received a sulphur application. By 1997, these proportions had increased markedly to 13-14% for cereals and 30% for oilseed rape. Dressing covers for sulphur generally remained fairly static until 2002, and then increased steadily to 2007. In 2009, there were reductions in dressing covers for all cereals except winter barley, with cereals sulphur dressing covers in the 32%-45% range. The 60% dressing cover for oilseed rape was a 10% reduction from 2008.
- In 2009, 20% of all crops and grass received a dressing of sulphur, this figure was 35% for tillage crops. On tillage crops the overall application rate for sulphur was 19 kg/ha, a drop of 4 kg in comparison to last year. Applications on grass were consistent with 2008 at 2 kg/ha, this low overall rate is caused by the low dressing cover, with only 5% of grass receiving a sulphur dressing.



SECTION A

THE BRITISH SURVEY OF FERTILISER PRACTICE

A1 INTRODUCTION AND STRUCTURE OF THE REPORT

The British Survey of Fertiliser Practice (BSFP) is the primary source of data on organic and inorganic fertiliser use in Great Britain. The results from the Survey are used by the British fertiliser industry, by Government and by the wider agricultural community. It is essential that the claims made from the Survey are underpinned by an effective methodology. Section A2 describes this methodology, detailing measures undertaken to avoid bias and unreliability. National changes in relative cropping areas are discussed in Section A3.

Section B provides a commentary of recent changes in survey data and longer term trends. Section C presents the main tables of results from the Survey, grouped by geographic coverage. They include major crop groups, grassland, product types and farm types. Figures for estimates of 'total', 'straight' and 'compound' nutrient rates are presented in separate tables. Section D provides an analysis of the application of organic manures and manufactured fertilisers.

A1.1 HISTORY

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

The current methods of survey design and implementation are the result of adaptation of the original design by 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 **dmr**kynetec (formerly Kynetec Limited), who also retained responsibility for conducting the fieldwork.

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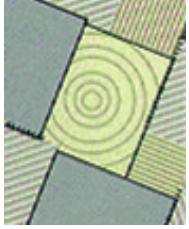
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

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

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

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



A2 SURVEY METHODOLOGY

A2.1 SAMPLE

The Survey sample is selected from the population of agricultural holdings compiled using the June Agricultural Survey (a sample survey conducted annually which records information on farm size, cropping, stocking and employment). In each year, two samples are extracted from the June Survey, one for England & Wales and one for Scotland. Holdings less than 20 hectares in size are excluded from the BSFP sample. In England & Wales, farms are classified into one of three types, cropping, livestock and horticulture. Farms are then further classified into four size groups. In Scotland, a similar number of size groups are used but farms are classified into only two types, mainly cropping and mainly livestock.

The 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 A2.4 paragraph 9 for more details.

The target sample size is 1500 farms. The farms are allocated to each of the combinations of farm type and size in proportion to the total area of crops and grass recorded in the June Survey in 2008 (the latest data that is available). The exception to this is that in England & Wales the number of farms in the horticultural group are sampled at a higher rate to ensure sufficient numbers for a robust estimate to be made. See Tables A2.1 and A2.2 for the number of farms selected.

Three reserves are selected for each farm in the main sample. The reserves will be the nearest holding (using the County/Parish/Holding (CPH) number) and of the same farm type and size. The survey is voluntary. Each farm in the main sample is contacted; if for whatever reason a farm is not able to take part in the survey, the first reserve for that farm is then contacted. If this farm also refuses then the second and if necessary the third reserve is contacted. If all four farms refuse then no farm is recruited into the survey.

This resulted in an achieved sample size of 1,373 holdings in 2009.

To help improve the survey response and to reduce the year-on-year variability, a core of respondents complete the survey each year. This was introduced in 2000 when approximately one third of the sample agreed to stay in the survey for a number of years. Between 2006 and 2007 a review of the panel structure was undertaken to ensure that the proportion of respondents who had participated on the panel for 5 consecutive years or more constituted no more than 20% of the total sample. In 2009, 62% of the sample had also responded in 2008.

The responses are weighted to be representative of the national population by using the inverse of the achieved sampling fraction (ie. the number of holdings in the population divided by the achieved sample size in each strata) as the weight.

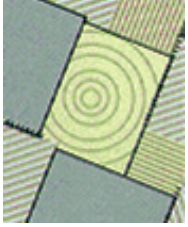


Table A2.1 Derivation of the stratified random sample for the 2009 survey, England & Wales

	farm holdings in population in 2008	total crops and grass in 2008 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
England & Wales						
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	17598	7.1	0.50	87	89	0.51
51-100 ha	15032	13.1	1.06	160	146	0.97
101-200 ha	9557	15.8	2.02	193	166	1.74
200+ ha	3265	12.8	4.80	157	147	4.50
Total livestock & mixed	45452	48.8	1.31	597	548	1.21
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	7447	3.1	0.52	38	41	0.55
51-100 ha	7751	6.8	1.08	84	87	1.12
101-200 ha	7254	12.5	2.12	154	144	1.99
200+ ha	6053	27.9	5.65	342	281	4.64
Total crops	28505	50.4	2.17	618	553	1.94
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	664	0.2	1.57	10	10	1.51
51-100 ha	255	0.2	3.47	9	5	1.96
101-200 ha	115	0.2	7.16	8	6	5.24
200+ ha	36	0.2	21.18	8	5	14.03
Total horticulture	1069	0.8	3.27	35	26	2.43
Total for England & Wales	75026	100		1250	1127	1.50

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2008*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2008*

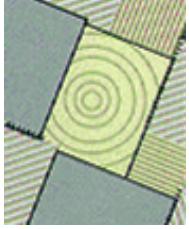


Table A2.2 Derivation of the stratified random sample for the 2009 survey, Scotland

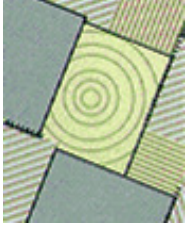
	farm holdings in population in 2008	total crops and grass in 2008 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
Scotland						
Cereal/general						
(Robust types: cereals, general cropping, horticulture)						
crops & grass area						
20-50 ha	1185	2.6	0.55	7	8	0.68
51-100 ha	1426	6.6	1.16	17	15	1.05
101-200 ha	1358	12.2	2.25	31	31	2.28
200+ ha	684	14.5	5.30	36	30	4.39
Total cereal/general	4653	36.0	1.93	90	84	1.81
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	3001	6.5	0.54	16	16	0.53
51-100 ha	3227	15.0	1.16	37	37	1.15
101-200 ha	2436	21.5	2.20	54	55	2.26
200+ ha	1061	21.1	4.97	53	54	5.09
Total livestock & mixed	9725	64.0	1.65	160	162	1.67
Total for Scotland	14378	100		250	246	1.71

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2009. 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.

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2008*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2008*



A2.3 DEFINITIONS OF TERMS

1. For the purpose of the Survey, the term **Great Britain** (or **Britain**) is defined to cover England (including the Isle of Wight), Wales (including Anglesey) and mainland Scotland.

2. The **survey year** ran from autumn 2008 to autumn 2009, corresponding to the 2009 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 2008. For data collection and processing purposes, separate fields with identical cropping and fertiliser management on the same farm are blocked together as one 'field', to represent the total combined area of those fields. Areas within the same natural boundary receiving different treatments (crops on fertilisers) were recorded separately. Agricultural land which had been set-aside under the Single Payment Scheme was recorded, but was not included in analyses unless it was used to grow an industrial crop. Fallow land other than set-aside has always been collected by the survey, but is not included in the calculations of this report.

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

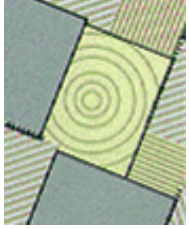
5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser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

6. For each fertiliser nutrient, the **average field rate** (of application) is defined as the sum of nutrient applied divided by the total area of those fields which received any dressing of the nutrient. 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). When combined with information from the national total crop area estimates in the June Agricultural Survey, these overall application rates provide a means of estimating the tonnage of fertiliser nutrient used during the survey year.

   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.

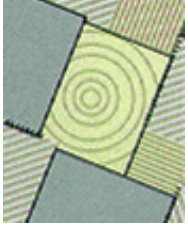
   Data presented in tables GB4.1 to GB4.5 are derived from the robust types shown below.

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 D1.4 and D3.2. 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 2009. 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.

11. Where changes in application rates are termed 'significant' this indicates that the probability of a change of this magnitude arising purely by chance (sampling error) is less than five percent.



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 2007/08 and 2008/09, and illustrates percentage changes in relative cropping areas over the past five years. There were about 11.2 million hectares of managed agricultural land in Britain in 2009, of which 4.6 million hectares (41%) were cultivated for tillage cropping and the remainder, 6.6 million hectares, were grassland (excluding rough grazing).

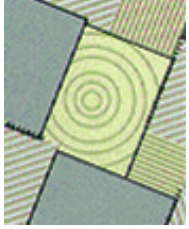
The Single Farm Payment was introduced on 1 January 2005, replacing all the previous main Common Agricultural Policy (CAP) payment schemes with a single payment. To obtain this single payment, farmers must demonstrate compliance with a number of measures designed to protect the environment. Extra payments are on offer to those who choose to take additional measures under either the Entry Level or Higher Level Stewardship schemes. One potential impact of both cross-compliance and the environmental stewardship schemes is that margins of fields will remain un-cropped. In this report, as was the case in for the last 3 years, all calculations of fertiliser rates have been made on the basis of sown area rather than field size.

Table A3.1 Cropping and grassland areas ('000 ha) in Great Britain, 2008 – 2009

Crops	June 2008 '000s ha	June 2009 '000s ha	% change since 2008	% change since 2004	2009 crop areas as % of total tillage area
Wheat	2068	1804	-12.8	-9.0	38.9
Barley – winter	410	406	-1.1	-2.4	8.8
– spring	596	728	22.1	28.9	15.7
Total cereals[1]	*3234*	*3094*	*-4.3*	*0.1*	*66.7*
Oilseed rape – total	598	581	-2.8	16.6	12.5
Sugar beet	120	116	-2.7	-24.3	2.5
Potatoes[2]	138	144	3.9	0.7	3.1
Linseed	16	29	77.9	-2.4	0.6
Peas/beans[3]	148	233	57.2	-3.6	5.0
Maize/other fodder	214	232	8.2	31.2	5.0
Vegetables	120	123	1.9	-0.7	2.6
Total tillage[4]	*4682*	*4638*	*-0.9*	*2.3*	*100.0*
Set-aside and bare fallow[5]	194	254	31.0	-56.6	
Grassland					2009 grass areas as % of total grass area
Less than 5 years old	1024	1141	11.5	3.4	17.4
5 years and older	5363	5415	1.0	10.0	82.6
Total grass[6]	*6387*	*6556*	*2.6*	*8.8*	*100.0*
Total crops and grass[7]	*11069*	*11194*	*1.1*	*6.0*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not bare fallow or set-aside.
[5] The obligatory set-aside rate for the 2009 Single Payment Year was set at 0%.
[6] managed grassland, excluding rough grazing.
[7] total tillage + total grassland.

Source: Annual Defra/SG-RERAS/Welsh Assembly Government (WAG) June Agricultural Survey data



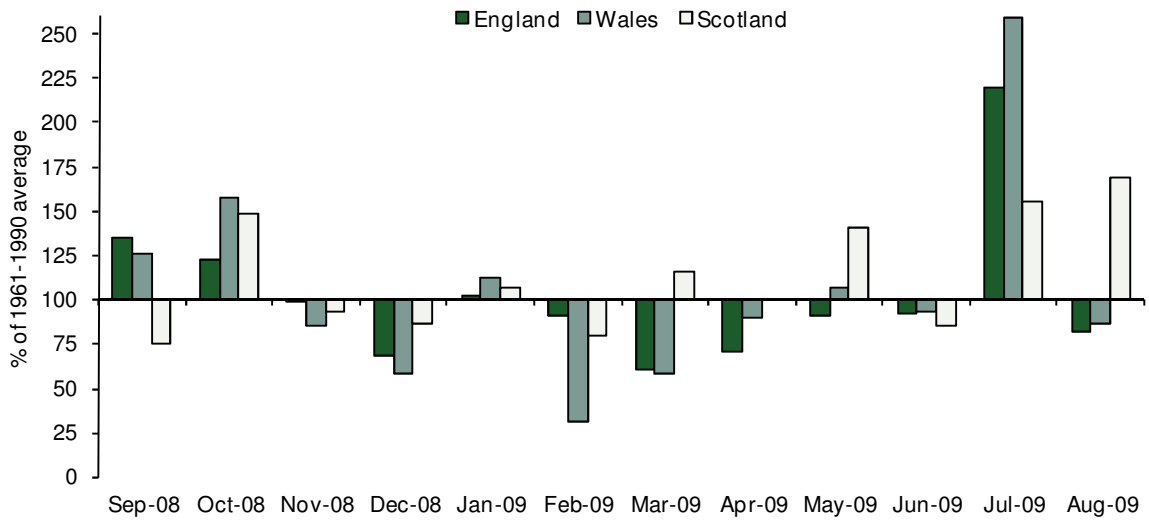
Looking between the 2008 and 2009 cropping years, the total area of uncropped land (bare fallow and set-aside) rose by 31% in 2009. This was caused by an increase in land left as bare fallow in both England and Scotland, with the set aside area remaining at zero in all countries. The total area under tillage crops reduced by 0.9% and cereals reduced by 4.3%. The 12.8% reduction in wheat area in 2009 was balanced by increases in spring barley, peas and beans.

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 hence affect nutrient requirements.

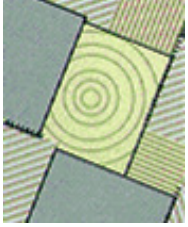
The wet harvest conditions of July and August 2008 were followed by a wetter than average September and October for England and Wales. In Scotland the picture was more mixed with a drier than average September and a wetter than average October. Whilst mean temperatures for the autumn were close to the long term average, it was the coldest since 1993. Overall, rainfall was below average for the period December to February, but England and Wales experienced significant snowfalls in the first half of February. Spring rainfall was also below average, the exception to this being Scotland in March 2009. A dry June was followed by a much wetter than average July, for England and Wales the wettest since 1914. For England and Wales August was drier than average, although Scotland experienced 169% of its average rainfall. Overall the three summers 2007-2009 were the wettest three consecutive summers since 1914.

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



When the weather affects the proportion of winter to spring crops (notably cereals and oilseed rape) this can have a major impact on fertiliser use because lower-yielding spring crops often require less fertiliser. The impact of all these factors on fertiliser use are discussed in Section B of this report.

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



SECTION B

COMMENTARY ON FERTILISER USE IN GREAT BRITAIN

This commentary refers to rates of application in mainland Britain of fertilisers containing nitrogen (N), phosphate (P_2O_5), potash (K_2O) and sulphur (SO_3) on tillage crops and grassland (excluding rough grazing). Section B1 of the report covers the five-year period 2005-2009. 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 2008-2009 growing season: they form a basis for estimating quantities of fertiliser used in Great Britain. The estimates of the average field rates provide a better indication than overall application rates of actual usage levels and also of any annual variation in fertiliser practice on farms. The definitions of the terms used are set out in Section A of this report.

The statistics on the pattern of fertiliser practice reported for Great Britain largely reflect practice in England & Wales due to its greater area of total crops and grassland: about 9.3 million hectares in England & Wales and about 2.0 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 the final Section of this and earlier annual reports in conjunction with the summary tables of annual fertiliser use in the main text of the 1995 report[7]. A summary of data from earlier years is available in Chalmers 2001[8].

[7] Burnhill P. M., Chalmers A. G. and Fairgrieve J. (1996) *The British Survey of Fertiliser Practice: fertiliser use on farm crops 1995.* HMSO: Edinburgh.

[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 2009 RESULTS FOR GREAT BRITAIN AND CHANGES IN RECENT YEARS

B1.1 OVERVIEW OF FERTILISER USE ON ALL CROPS AND GRASS

Overall rates of total nitrogen, phosphate and potash in Great Britain over the last five years are illustrated in Figure B1.1, which is based on data presented in Tables B1.1 and B1.2. Whilst the data show a trend of declining overall application rates on all crops and grass for nitrogen, phosphate and potash, the total nitrogen rate in 2009 increased by 2 kg/ha on 2008. 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 2005 – 2009

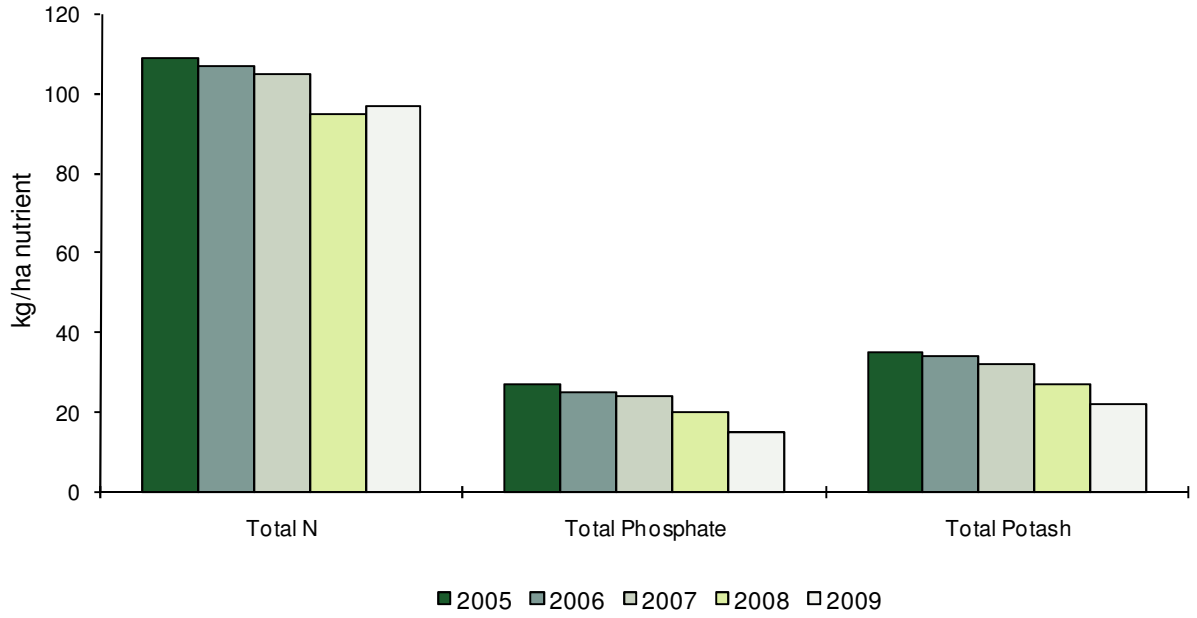


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2005 – 2009

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2005	150	74	109
2006	147	72	107
2007	148	65	105
2008	140	55	95
2009	139	57	97

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2005	129	28	74
2006	128	28	74
2007	133	26	77
2008	125	23	71
2009	125	28	75

Compound nitrogen

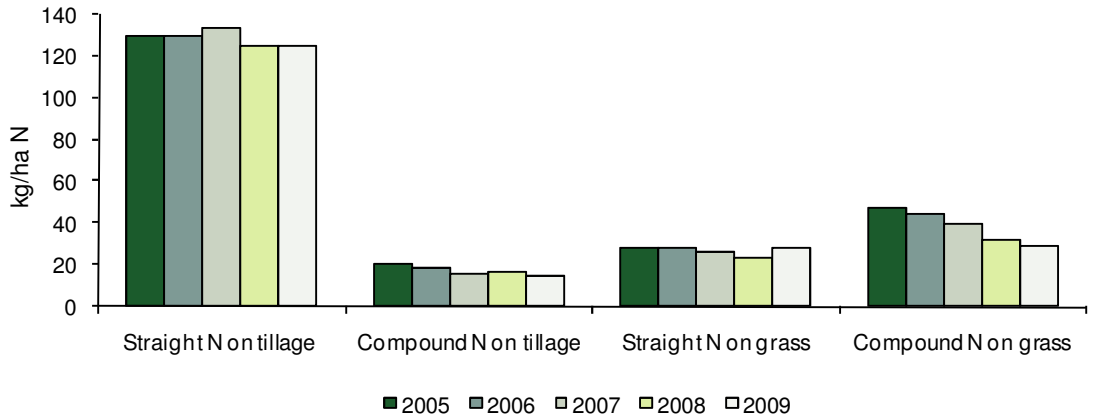
	tillage crops	*grass*	*all crops and grass*
2005	20	47	35
2006	18	44	32
2007	15	39	28
2008	16	32	24
2009	14	29	22

B1.1.1 Nitrogen

All crops and grassland

The 2 kg/ha increase in total nitrogen use on all crops and grassland (Figure B1.1) was caused by an increase in the overall rate of straight N used on grass. The trend of declining overall rates of compound nitrogen continued both on tillage crops and grass (Table B1.1).

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2005 – 2009



Tillage crops

Straight N continues to be the main source of nitrogen on tillage crops. The minor changes to the proportion of tillage area receiving a straight nitrogen dressing, and the average field application rate are responsible for the overall total nitrogen for these crops being the same as in 2008 at 125 kg/ha.

Grassland

In 2008 the overall nitrogen application rate of 55 kg/ha was the lowest reported for the whole survey period since 1983 (see section B2). The 2 kg/ha increase to the overall N application rate in 2009 was due to a higher proportion of the grass area receiving a dressing of straight N and an increased average field rate (100 kg/ha). Marginal reductions in dressing cover and a lower average field rate of compound N applied to grass were also seen, but these were at a lower level than the increases observed for straight N.

B1.1.2 Phosphate and Potash

Phosphate

Table B1.2 shows overall phosphate levels for the past five years. The 2009 rates were not only the lowest in the past five years but also the lowest since this data set began in 1983 for both tillage (23 kg/ha) and grass (9 kg/ha). On tillage crops this was partly due to a fall in the area receiving phosphate fertiliser from 52% in 2008 to 40% in 2009 (five year mean 53%), but also a 2 kg/ha decline in the average application rate. For grassland the reduction in the average application rate was less marked, but the area receiving phosphate fertiliser reduced from 42% in 2008 to 38% in 2009 (five year mean 48%).

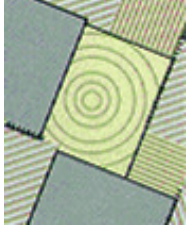


Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2005 – 2009

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2005	40	16	27
2006	35	16	25
2007	34	14	24
2008	31	10	20
2009	23	9	15

Total potash

	tillage crops	*grass*	*all crops and grass*
2005	53	20	35
2006	49	21	34
2007	47	18	32
2008	43	13	27
2009	33	12	22

Potash

As with phosphate, overall potash use in 2009 fell to the lowest ever recorded by the Survey on tillage crops (33 kg/ha) and grassland (12 kg/ha) alike. On tillage crops this fall was caused by a decrease in the tillage area receiving a dressing; from 55% in 2008 to 43% in 2009 as well as a small reduction in average field application rate. On grassland there was also a reduction in the area receiving potash (42% in 2008 down to 39% in 2009), compounded by a 2 kg/ha fall in the average field application rate compared to last year.

B1.2 FERTILISER USE ON MAJOR TILLAGE CROPS

Overall and average field rates of fertiliser application for major tillage crops in Great Britain over the past five years are summarised in Tables B1.3 and B1.4. More detailed statistics for 2009 are presented in Section C. Longer term trends in overall application rates of nitrogen, phosphate and potash since 1983 are summarised in Section B2.

Small apparent changes in fertiliser use on individual crops should be treated with a degree of caution as these estimates are based on a smaller number of farms and fields than the aggregate estimates for all tillage crops. Information on sampling errors, which help in judging whether apparent changes may be real or attributable to sampling variation alone, is given in Appendix 1.

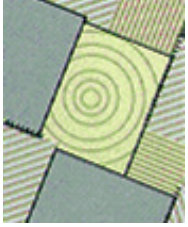


Table B1.3 Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2005 – 2009

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	195	102	142	166	201	94
2006	192	101	136	142	191	99
2007	190	98	136	131	189	92
2008	178	94	134	154	191	86
2009	188	100	140	168	185	94

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	183	58	128	43	184	85
2006	180	60	118	42	177	87
2007	182	61	124	30	181	82
2008	169	56	120	40	183	77
2009	180	69	129	50	178	90

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	13	43	14	122	17	9
2006	12	41	18	100	14	13
2007	8	37	12	102	8	10
2008	9	39	15	114	9	9
2009	7	31	10	118	7	5

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	37	40	42	153	40	37
2006	34	39	37	122	34	35
2007	31	36	35	130	30	41
2008	27	34	35	130	29	31
2009	17	29	22	141	20	20

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	44	52	57	256	42	112
2006	41	60	54	197	38	109
2007	39	49	59	199	38	104
2008	36	47	51	235	36	90
2009	23	41	34	245	24	73

[a] Figures for maincrop potatoes include second earlies.

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

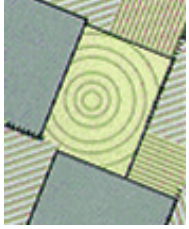


Table B1.4 Average field rates (kg/ha) on major tillage crops, Great Britain 2005 – 2009

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	197	105	144	171	203	101
2006	194	103	139	151	193	108
2007	193	102	139	144	190	95
2008	181	99	138	156	193	92
2009	190	103	142	181	186	98

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	190	89	137	104	191	100
2006	189	89	130	105	182	100
2007	189	91	135	76	183	89
2008	177	88	132	99	186	88
2009	187	94	137	121	182	95

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	73	66	60	153	56	79
2006	71	65	67	130	53	84
2007	58	65	61	131	40	69
2008	74	64	63	147	46	65
2009	72	61	64	140	37	41

Total phosphate

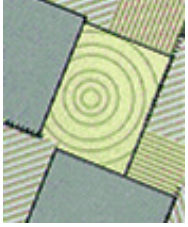
	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	61	51	61	168	63	73
2006	62	54	59	141	59	72
2007	62	51	58	149	61	77
2008	61	48	56	147	61	58
2009	54	48	53	159	54	47

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2005	72	63	78	271	68	147
2006	75	76	76	211	69	143
2007	76	64	80	221	72	126
2008	76	62	74	249	71	112
2009	72	61	72	272	67	109

[a] Figures for maincrop potatoes include second earlies.

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



B1.2.1 Nitrogen

In 2008 overall rates of total nitrogen (Table B1.3) decreased on all the major tillage crops except maincrop potatoes and oilseed rape. In 2009 the general trend was for these rates to recover to their 2007 levels. Average field rates (Table B1.4) showed similar trends.

Winter wheat

The majority of the nitrogen on winter wheat continued to be applied in the straight form (95%).

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 2005 – 2009

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2005	224	186	111	95	130	152
2006	219	182	107	97	129	144
2007	212	184	107	96	129	145
2008	202	174	102	95	120	144
2009	211	180	105	100	139	143

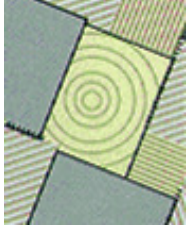
Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice[9]. Milling varieties are often grown as a second wheat and often receive extra nitrogen, either as a solid dressing or as late foliar urea spray, which is applied to improve the chances of achieving an adequate grain protein content for a milling premium. High yielding feed crops, rather than lower yielding varieties of milling wheat, are often grown as a first winter wheat after a break crop such as oilseed rape. This is to exploit the potential yield and residual soil nitrogen benefits from the crop rotation, and also to avoid any risk of lower grain protein concentrations as a result of high yield diluting the grain nitrogen concentration for first wheat in the rotation.

The non-milling crop continues to dominate the wheat crop area (Table B1.6) with only 33% of the crop area in 2009 being grown as milling wheat (5 year mean: 31%).

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2005 – 2009, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2005	30	70	62	38	33	67
2006	34	66	57	43	30	70
2007	33	67	56	44	37	63
2008	27	73	54	46	27	73
2009	33	67	57	43	34	66

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



Spring barley

Overall use of total nitrogen on spring barley increased by 6 kg/ha in 2009 to 100 kg/ha back in line with the five year mean. The overall application rate of straight nitrogen increased to 69 kg/ha, whilst the overall application rate for compound N reduced to 31 kg/ha. This reflects the trend since 2005 for a reducing percentage of the spring barley area receiving a dressing of compound N (51% in 2009). Average field rate for total nitrogen was 103 kg/ha in 2009, continuing the trend of decline since the value of 114 kg/ha in 2001.

Further analysis of the data by crop type (Table B1.5) shows the average rate applied to the spring malting crop had increased from 2008 to 105 kg/ha. For non-malting crops the nitrogen application rate reversed a declining trend since 2002 to reach 100 kg/ha in 2009, with a five year mean of 97 kg/ha.

Estimated nitrogen rates on spring barley crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 10 kg/ha over the last five years. This slightly higher use of nitrogen on malting than non-malting crops may seem anomalous, since lower rates of nitrogen are recommended for malting barley, under the same conditions of soil type and nitrogen fertility level, than for the feed varieties of barley. This recommendation is made to avoid the risk of high grain nitrogen content, which would adversely affect subsequent malt quality. However, malting crops are normally grown on soils with low nitrogen fertility and the average field rates of nitrogen reported for malting varieties in Table B1.5 are generally in the range recommended for mineral soil types with low nitrogen residues (70 - 120 kg/ha)[10]. 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 2005-2009 is 57%.

Winter barley

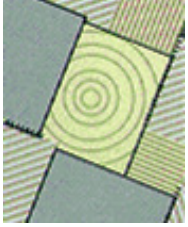
In the period 2002-2008 overall total nitrogen use on winter barley decreased from year to year, down to 134 kg/ha in 2008. This rate increased by 6 kg/ha to 140 kg/ha in 2009. The straight nitrogen rate increased by 9 kg/ha whereas the compound nitrogen rate fell by 5 kg/ha.

Nitrogen requirements for winter barley, as with the spring sown crop, depend on a range of agronomic factors, including the intended market for the grain. Field average rates of nitrogen on malting crops increased 19 kg/ha to 139 kg/ha and decreased by 1 kg/ha to 143 kg/ha on non-malting crops in 2009 (Table B1.5).

The higher application rates of nitrogen (five-year mean of +16 kg/ha) on non-malting, compared to malting winter barley crops, reflect typical agronomic practice, although the gap between malting and non malting crops was less than in previous years. The majority of winter barley crops (both feed and malting) are grown in England in arable rotations, usually after a previous cereal crop, when the soil nitrogen fertility status is low. Higher nitrogen rates are recommended for feed crops.

The proportion of relative crop area grown for malting was at its lowest in the last 5 years in 2008 at 27%. In 2009 this recovered to 34%, giving a five year mean of 32% of the crop grown for malting (Table B1.6).

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



Maincrop potatoes

Total nitrogen use on maincrop potatoes has fluctuated over the last five years. In 2009 it increased to 168 kg/ha, from a low of 131 kg/ha in 2007, exceeding the five year mean of 152 kg/ha (Table B1.3). This increase in 2009 is due to an increase in the average field rate of straight nitrogen (Table B1.4), as well as a increase in the area receiving any compound nitrogen fertiliser (78% in 2008 compared with 85% in 2009).

Oilseed rape

In 2009, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, decreased by 6 kg/ha to 185 kg/ha (five year mean 191 kg/ha). The decrease was caused by reduced average field rates of straight and compound nitrogen.

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 4 kg/ha between 2008 and 2009, returning to the rate seen in previous years. While the rate for spring crop appears to have increased by 5 kg/ha, it should be remembered that this crop represents only 5% of the total oilseed rape area and data for it are drawn from a much smaller number of sample points and should consequently be treated with caution (Table B1.7).

Table B1.7 Average field application rates of nitrogen (kg/ha) on winter and spring oilseed rape, Great Britain 2005 – 2009

Total nitrogen (kg/ha)

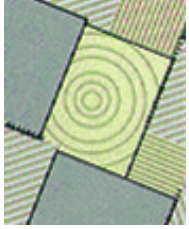
	winter oilseed rape	*spring oilseed rape**
2005	206	153
2006	192	163
2007	191	127
2008	194	115
2009	190	120

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

Challenging conditions for establishment in August and September 2008 resulted in a lower level of winter cropping than seen in previous years (95%).

Sugar beet

The overall nitrogen use on sugar beet rose considerably (+8 kg/ha) in 2009 to 94 kg/ha, counteracting a similar fall seen in 2007, and returning the rate to the five year mean. This increase occurred because the proportion of crop area receiving a nitrogen dressing rose (96% in 2009 compared with 93% in 2008) and the average rate of straight nitrogen increased by 6 kg/ha.



B1.2.2 Phosphate and Potash

Phosphate

Overall phosphate use on tillage crops reduced significantly by 8 kg/ha in 2009. The reduction is consistent across major arable crops with only potatoes showing an increase over 2008 levels (Table B1.3). Reductions in overall rates were caused by a reduction of field rates (except for spring barley and maincrop potatoes) and by reduced proportions of the crops receiving a phosphate dressing. The overall phosphate rate of 23 kg/ha is the lowest since the survey began in 1983.

Potash

Overall potash use on tillage crops decreased in 2009 by 10 kg/ha to 33 kg/ha. This is associated with a reduction in the tillage area receiving a dressing (55% in 2008, down to 43% in 2009) and a marginally reduced average field rate. The average field rates for cereals all reduced in 2009, and were at their lowest for 5 years. The average field rate for potash increased on potatoes (to 272 kg/ha) and decreased on sugar beet and oilseed rape (to 109 kg/ha and 67 kg/ha respectively). Part of the reason for recent apparent fluctuations in estimates of nutrient application rates for sugar beet and potatoes may be because these crops are not always managed by the farmers themselves; it is recognised that information on the nutrient content of fertilisers applied by contractor is less reliably reported by farmers than for self-applied products.

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. Since then however, dressing covers for sulphur 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%. The figure for oilseed rape was static in 2007 and 2008 at 70%, with a 10% reduction observed in 2009 (Table1.8). Average field rates showed a similar pattern of decrease, the exception again being winter barley where the rate increased by 4 kg/ha.

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2005 – 2009

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2005	41	34	32	59
2006	43	42	32	64
2007	46	44	36	70
2008	43	42	35	70
2009	39	45	32	60

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2005	55	52	41	82
2006	51	49	41	70
2007	51	53	43	80
2008	51	46	42	85
2009	47	50	41	79

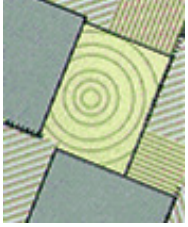


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of the risk of sulphur deficiency in Scotland due to historically extremely low levels of atmospheric sulphur deposition, compared to most other areas of Britain. It is clear that arable farmers in England & Wales became more aware of the need to apply sulphur, illustrated by the increasing percentage dressing cover figures for all major tillage crops in between 2004 and 2007. In 2009 these percentage dressing covers have fallen back for the major crops, the exception to this being winter barley.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2005 – 2009

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2005*	41	33	31	59
	2006	42	41	32	63
	2007	46	45	38	72
	2008	43	42	42	70
	2009	39	44	34	60
Scotland*	*2005*	41	37	33	61
	2006	52	60	31	83
	2007	56	39	32	53
	2008	48	42	27	66
	2009	54	55	30	67

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

B1.3 FERTILISER USE ON GRASSLAND

Overall fertiliser usage on grassland in Great Britain in the last five years, as previously shown (Tables B1.1 and B1.2), is summarised again in Table B1.10. The corresponding estimates of dressing cover and average field rates for each nutrient are shown in Table B1.11.

Table B1.10 Overall fertiliser use (kg/ha) on grassland, Great Britain 2005 – 2009

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2005	28	47	74	16	20
2006	28	44	72	16	21
2007	26	39	65	14	18
2008	23	32	55	10	13
2009	28	29	57	9	12

Dressing cover for total nitrogen of grass increased by 1 kg/ha between 2008 and 2009 (Table 1.11). The trend over the last 5 years has been for less of the grass area to receive a dressing of N, 59% in 2009 against a five year average of 64%. As in previous years a higher proportion of grass received compound N as opposed to straight N, but the average field rate for compound N is three quarters of the straight N rate (100 kg/ha).

Overall application rates for phosphate and potash on grass continued their slow decline.

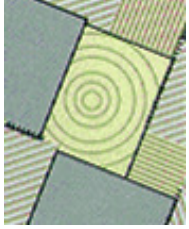


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2005 – 2009

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2005	26	54	68	55	55
2006	28	55	70	56	56
2007	26	49	66	51	51
2008	25	42	58	42	42
2009	28	39	59	38	39

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2005	107	87	109	29	37
2006	102	80	103	28	37
2007	103	79	99	27	35
2008	93	77	95	24	32
2009	100	76	98	23	30

The proportion of the grass area receiving a straight nitrogen dressing increased by 3 kg/ha in 2009, and compound N dressing cover reduced by 3 kg/ha to 39%. Dressing cover percentages of phosphate and potash continued to decline at 38% and 39% of grass area. The five year means are 48% and 49% respectively.

Average field rates for phosphate and potash were at their lowest level for the five year period in 2009, falling to 23 kg/ha for phosphate and 30 kg/ha for potash, compared with means for the period of 26 kg/ha and 34 kg/ha, respectively.

B1.3.1 Nitrogen

Cutting and grazing management

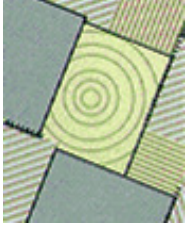
Fertiliser requirements for grassland vary according to the type of livestock enterprise, intensity of production and the associated cutting and grazing regimes used for sward management. Fertiliser use on dairy, other livestock and mixed farms in Great Britain in 2009 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2005 are summarised in Table B1.12. These should not be taken as authoritative national estimates of grassland utilisation, as the Survey is designed to estimate fertiliser application rates, not to derive accurate crop areas, although these may still be the best estimates of grassland utilisation by area.

Table B1.12 Grassland utilisation (% of grass area), Great Britain 2005 – 2009

	grazed [a]	*silage* [b]	*hay* [b]
2005	93	28	13
2006	91	31	11
2007	92	30	12
2008	95	29	12
2009	93	29	12

[a] May also be cut.

[b] May also be grazed.



Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2009 is the same as the five year mean at 93%.

Fertiliser usage for the different cutting and grazing categories is presented in Table B1.13. The differences in average field rates for each nutrient illustrate the influence of grassland management practice on fertiliser inputs.

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2005 – 2009

Total nitrogen

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2005	74	124	52	108	140	83
2006	72	113	53	102	130	86
2007	63	106	47	97	128	81
2008	52	96	40	92	121	74
2009	55	104	40	95	124	82

Straight nitrogen

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2005	27	40	20	107	111	90
2006	28	44	23	102	108	81
2007	26	40	19	101	118	75
2008	22	37	21	91	104	75
2009	27	49	23	98	113	88

Compound nitrogen

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2005	46	84	32	86	114	68
2006	44	70	30	79	100	70
2007	38	66	28	76	99	73
2008	30	59	19	73	97	73
2009	28	55	17	73	96	67

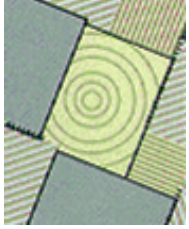
In 2009 the overall total nitrogen rates for both the grazed and silage categories recovered from the lows observed in 2008. The increase in overall application rates was caused by higher average field rates for all utilisation categories as the proportion of the grass receiving a dressing of N had generally declined.

Overall application rates and average field rates of straight nitrogen increased in all categories of grass in 2009, against a trend of decline in previous years. Compound nitrogen has continued its downward trend and has ended on a five-year low for all categories of management. The five year means for the overall compound nitrogen rate are 37, 67 and 25 kg/ha for grazed grass, silage and hay respectively, a fall of around 4-5 kg/ha on last year's five year means across all grass types. Average field rates for grazed and silage grass for compound nitrogen fertilisers are consistent with those seen in 2008.

The fall in nitrogen use on grassland throughout the five year period is likely to be related in part to decreases in ruminant livestock numbers which may have reduced herbage production requirements.

[a] May also be cut.

[b] May also be grazed.



B1.3.2 Phosphate and Potash

Phosphate and potash requirements for grassland depend, as for nitrogen, on the system of sward management.

Table B1.14 Phosphate and potash use (kg/ha) by grassland utilisation, Great Britain 2005 – 2009

Total phosphate

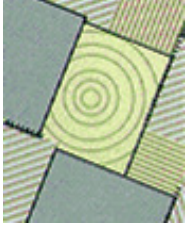
	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2005	16	25	14	28	35	28
2006	15	24	15	27	35	30
2007	13	21	11	26	31	30
2008	9	18	7	23	30	22
2009	8	15	7	22	28	26

Total potash

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2005	19	40	17	35	51	34
2006	20	38	16	35	52	34
2007	17	33	15	33	48	37
2008	12	28	8	30	44	26
2009	11	25	9	29	42	33

Overall phosphate rates declined over the period 2005-2009 (Table B1.14). In 2009, the rates across all grass types were the lowest for the period. The corresponding five-year means for grazed grass, silage and hay were 12, 21 and 11 kg/ha, respectively. Average field rates showed a similar pattern, although the average phosphate field rate for hay rose by 4 kg/ha.

Like phosphate, overall potash rates have declined between 2005 and 2009 to reach a five year low across grazed and silage grassland. Five year means were 16, 33 and 13 kg/ha for grazed grass, silage and hay, respectively. Average field rates showed similar trends.



B1.3.3 Sulphur

In 2009, only 5% of the total grassland area received a sulphur dressing (mean 6% for 2005-2009 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 in the past five years, with only grass cut for silage showing an increase in 2009.

The significant proportion of heavier textured soil types which occur in the main grassland farming areas, and assumed inputs of sulphur from slurry applications to silage fields, are among possible reasons for the current low level of sulphur fertiliser use on grassland.

Table B1.15 Sulphur use on grassland, Great Britain 2005 – 2009

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2005	5	11	6	6
2006	7	14	4	7
2007	5	10	4	5
2008	4	9	4	5
2009	5	12	5	5

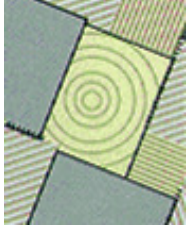
Average application rate per year (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2005	34	39	47	37
2006	38	35	23	38
2007	45	47	28	43
2008	33	34	44	33
2009	29	29	26	29

Estimated average field rates of sulphur application showed sharp increases across all sward management systems in 2007, with grazed grass and grass cut for silage reaching their highest rates for the past five years. Since then, these rates have fallen back in 2008, to 26-29 kg/ha across the different grassland utilisations. The five year means are 36, 37 and 34 kg/ha SO_3 for grazed, silage and hay grassland, respectively (Table B1.15). Note that the average application rates in Table B1.15 are annual totals, not rates per cut.

[a] May also be cut.

[b] May also be grazed.



B2 LONGER TERM TRENDS FOR GREAT BRITAIN

B2.1 NITROGEN USE

The British Survey of Fertiliser Practice was first undertaken as an integrated British survey in 1992. Before then, the annual Survey of Fertiliser Practice had been carried out separately for England & Wales and for Scotland. Survey statistics from those earlier surveys have since been collated in order to report an aggregated series for total nitrogen, phosphate and potash use on tillage crops and grassland in Great Britain since 1983, when the survey in Scotland started.

Table B2.1 Total overall nitrogen application rates (kg/ha), England & Wales 1971 - 2009 and Scotland and Great Britain 1983 – 2009

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1971	90	-	-	74	-	-	-	-	-
1972	91	-	-	83	-	-	-	-	-
1973	89	-	-	85	-	-	-	-	-
1974	85	-	-	91	-	-	89	-	-
1975	86	-	-	99	-	-	93	-	-
1976	96	-	-	98	-	-	97	-	-
1977	100	-	-	110	-	-	111	-	-
1978	105	-	-	113	-	-	114	-	-
1979	113	-	-	117	-	-	121	-	-
1980	121	-	-	119	-	-	120	-	-
1981	135	-	-	125	-	-	130	-	-
1982	141	-	-	123	-	-	132	-	-
1983	154	113	149	125	131	126	139	124	136
1984	162	121	157	132	127	131	147	125	143
1985	161	131	157	131	130	131	146	130	144
1986	156	119	152	135	120	132	146	120	142
1987	160	139	157	133	116	130	147	125	143
1988	149	125	146	116	132	119	133	129	132
1989	150	128	147	127	111	124	139	118	136
1990	149	131	147	132	116	129	141	122	138
1991	154	128	151	133	111	129	143	117	139
1992	147	125	145	104	111	106	126	116	125
1993	137	130	137	112	114	112	124	119	124
1994	149	128	147	117	112	116	133	118	130
1995	151	140	149	119	114	118	134	124	132
1996	148	122	145	118	100	115	133	108	128
1997	151	134	149	123	124	123	137	128	136
1998	146	131	144	107	119	109	127	124	126
1999	143	126	141	108	117	110	126	121	125
2000	154	135	149	95	110	99	124	118	123
2001	144	147	145	90	113	94	114	127	116
2002	153	143	150	85	105	89	116	119	117
2003	152	135	149	79	102	83	112	114	113
2004	154	134	152	73	93	77	110	108	108
2005	152	134	150	72	84	74	110	102	109
2006	150	121	147	69	86	72	108	98	107
2007	152	120	148	64	72	65	108	90	105
2008	144	111	140	52	66	55	98	82	95
2009	143	113	139	54	69	57	99	84	97

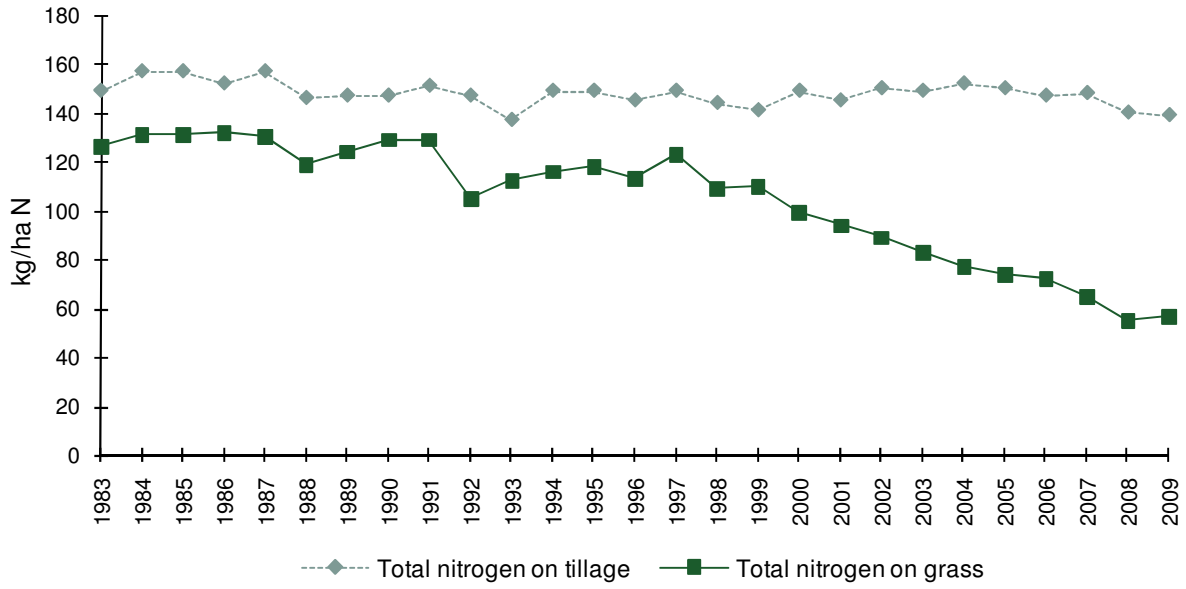
The aggregated data for Great Britain follow a similar pattern to that observed for England & Wales because a large proportion of both the tillage an grassland areas in Britain is located in England & Wales. Overall total nitrogen rates for tillage crops and grassland in England & Wales since 1969 and in Scotland and Great Britain since 1983 are summarised in Table B2.1. The data for Great Britain are presented graphically in Figure B2.1. Overall nitrogen use has been consistently higher on tillage crops than on grassland ever since the British survey started.

Apart from a dip in 1992-93 due to the introduction of set-aside, the overall rate of total nitrogen on tillage land stayed within the range 145-150 kg/ha with some wider fluctuations caused by factors such as changes in the crop area or changes in nitrogen applications to specific crops (see Figure B2.3). The rates for 2008 and 2009 were below that range, with the overall rate of nitrogen on tillage crops for Great Britain being 139 kg/ha.

Nitrogen levels applied to grassland have been consistently lower than tillage crops. From 1983 until 1999, the difference was fairly constant, averaging 27 kg/ha. Since 2000, the overall applications made to grass have fallen consistently relative to those made to tillage crops, although in 2009 the overall rate for total nitrogen rose slightly in comparison to 2008.

Data on straight and compound nitrogen for Great Britain are not available for the period 1983-1991 when the survey in Scotland was separate from the one in England & Wales. Figure B2.2 shows the overall rates of straight and compound nitrogen on tillage crops and grassland. Most of the total nitrogen fertiliser used on tillage crops each year has been applied in straight form. There is a marked difference for grassland where compound nitrogen accounts for around two thirds of the total applied.

Figure B2.1 Overall application rates (kg/ha) of total nitrogen on tillage crops and grassland, Great Britain 1983 – 2009



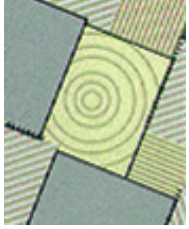
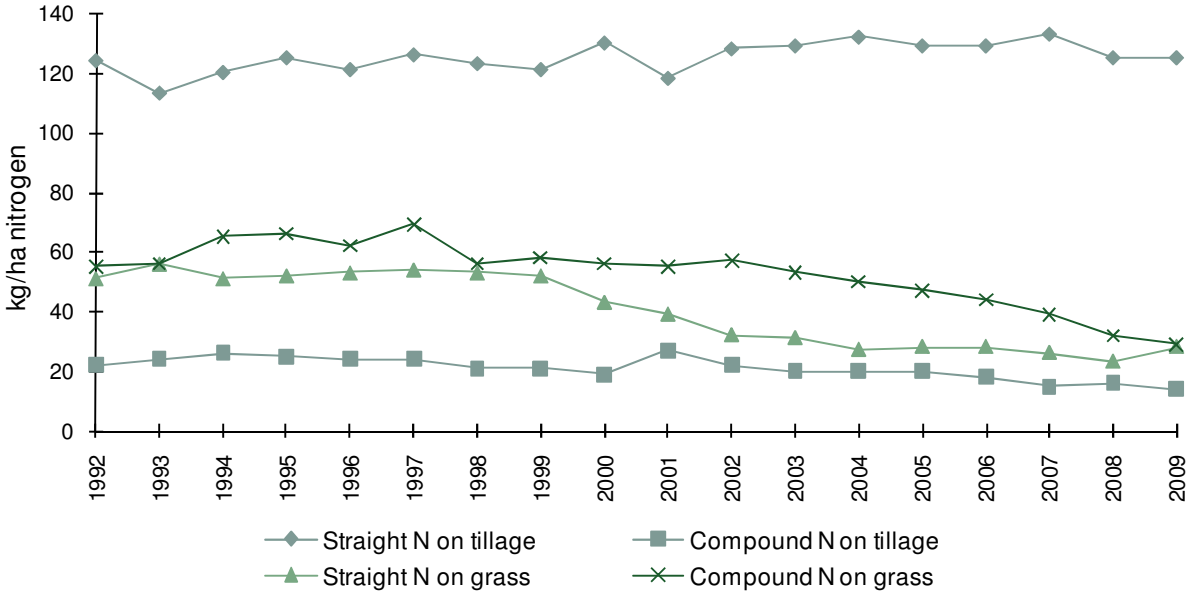


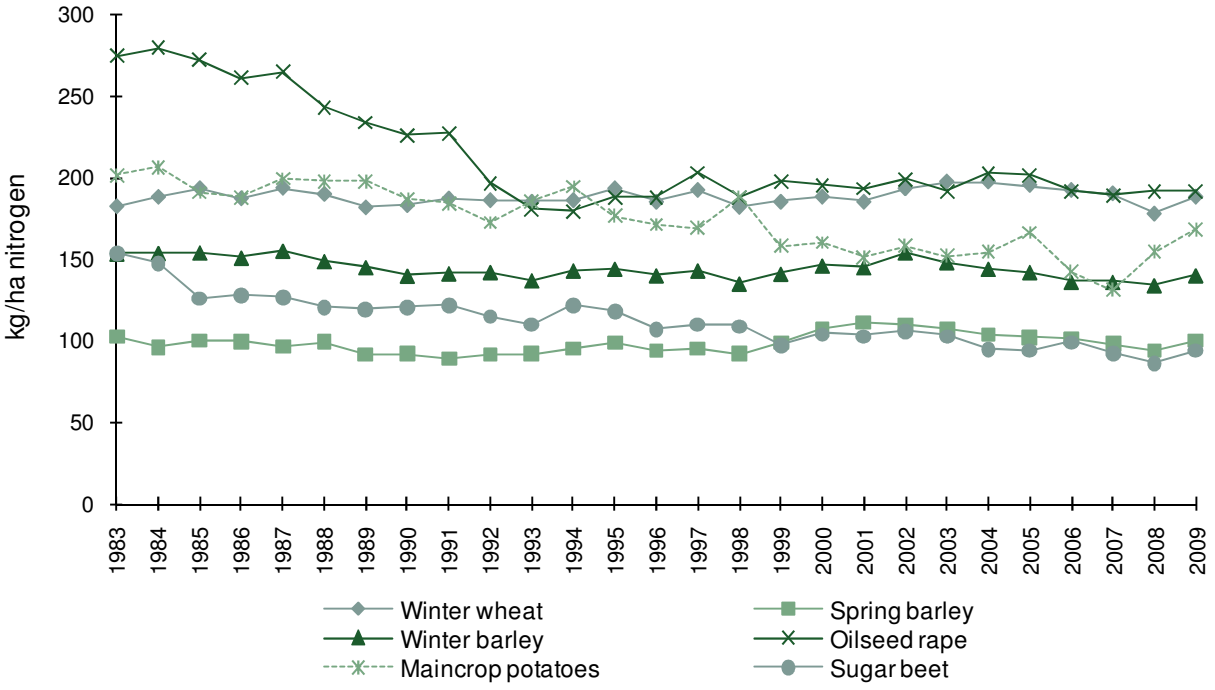
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2009

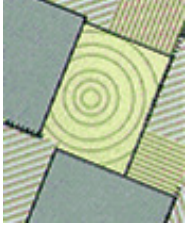


B2.1.1 Nitrogen use on major tillage crops

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 – 2009





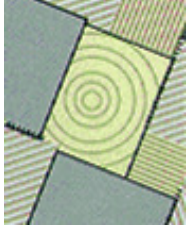
B2.1.2 Autumn and winter applications of nitrogen fertiliser

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

Autumn nitrogen at 30 kg/ha is recommended for winter oilseed rape, unless the soil has a high nitrogen fertility, as the crop normally requires more nitrogen than winter cereals during the autumn growth period.

Table B2.2 Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape and average application rate (kg/ha) for winter oilseed rape, England & Wales 1985 – 1998 and Great Britain 1999 – 2009

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



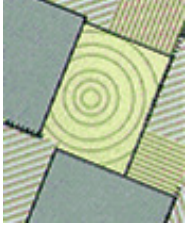
B2.2 PHOSPHATE AND POTASH USE

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

Table B2.3 Overall phosphate application rates (kg/ha), England & Wales 1969 - 2009 and Scotland and Great Britain 1983 – 2009

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

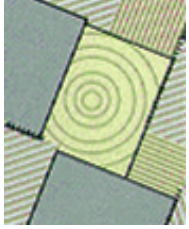
Overall phosphate use on tillage crops had gradually declined over the period since 1983, from a five-year mean of 58 kg/ha in 1983-87, 54 kg/ha in 1988-1992 and 53 kg/ha in 1993-97 to 46 kg/ha for the period 1998-2002. The 2009 rate of 23 kg/ha is the lowest rate recorded since Great Britain records began.



The overall rate of phosphate on grassland was highest in 1983, at 28 kg/ha, and then application remained relatively stable at 23-25 kg/ha between 1985 and 1997, apart from a temporary recorded drop to 21 kg/ha in 1992-93. However, overall phosphate use has decreased gradually since 1997 to a level of 9 kg/ha in 2009, the lowest recorded since 1983. The five-year means have been 25 kg/ha in 1983-87, 23 kg/ha in 1988-1992, 23 kg/ha in 1993-97, 20 kg/ha in 1998-2002 and 13 kg/ha for the period 2005-09.

Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2009 and Scotland and Great Britain 1983 – 2009

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

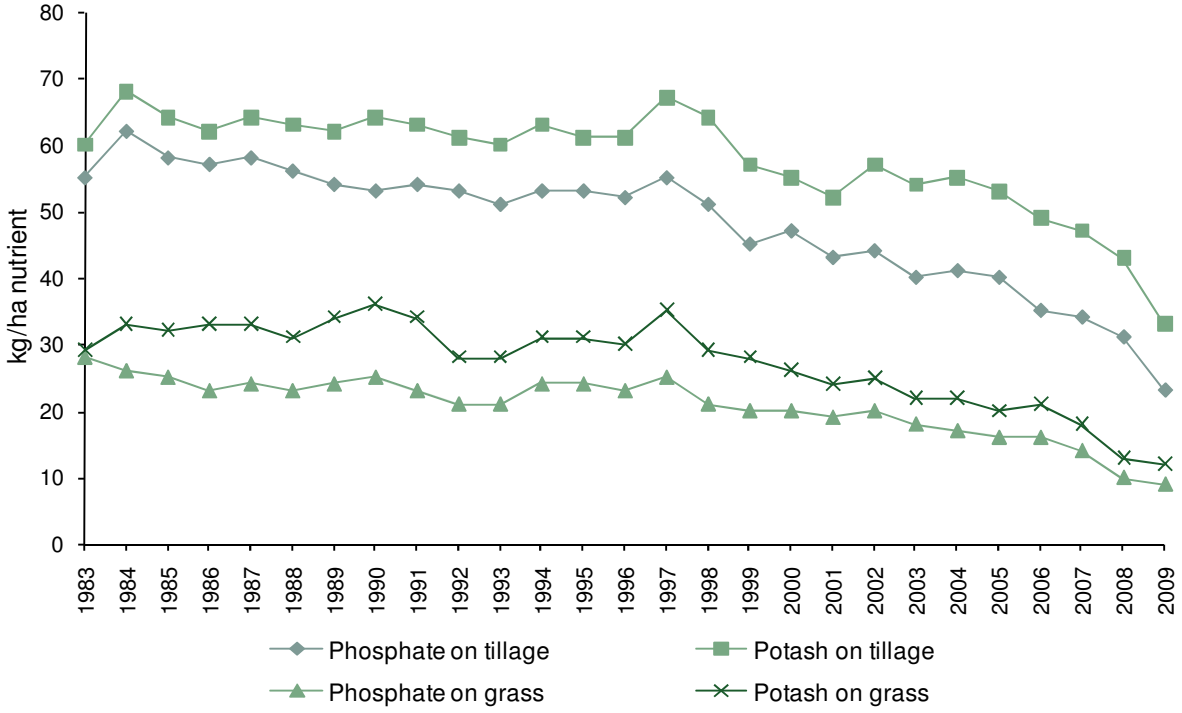


Overall potash use on tillage crops declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1988-1992, 62 kg/ha in 1993-1997, and 57 kg/ha in 1998-2002. Between 2005 and 2009, overall potash use on tillage crops averaged 45 kg/ha, the rate of 33 kg/ha in 2009 being the lowest level recorded since 1983.

The pattern of overall potash use on grassland has been more variable, compared to tillage crops, but has also shown a net decline between 1983 and 2009. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases.

Overall rates of phosphate and potash applied to tillage crops are more than double those used on grassland. However there is greater use of manures on grassland (37% cover) than on tillage crops (20% cover).

Figure B2.4 Overall application rates (kg/ha) phosphate and potash on tillage crops and grassland, Great Britain 1983 – 2009



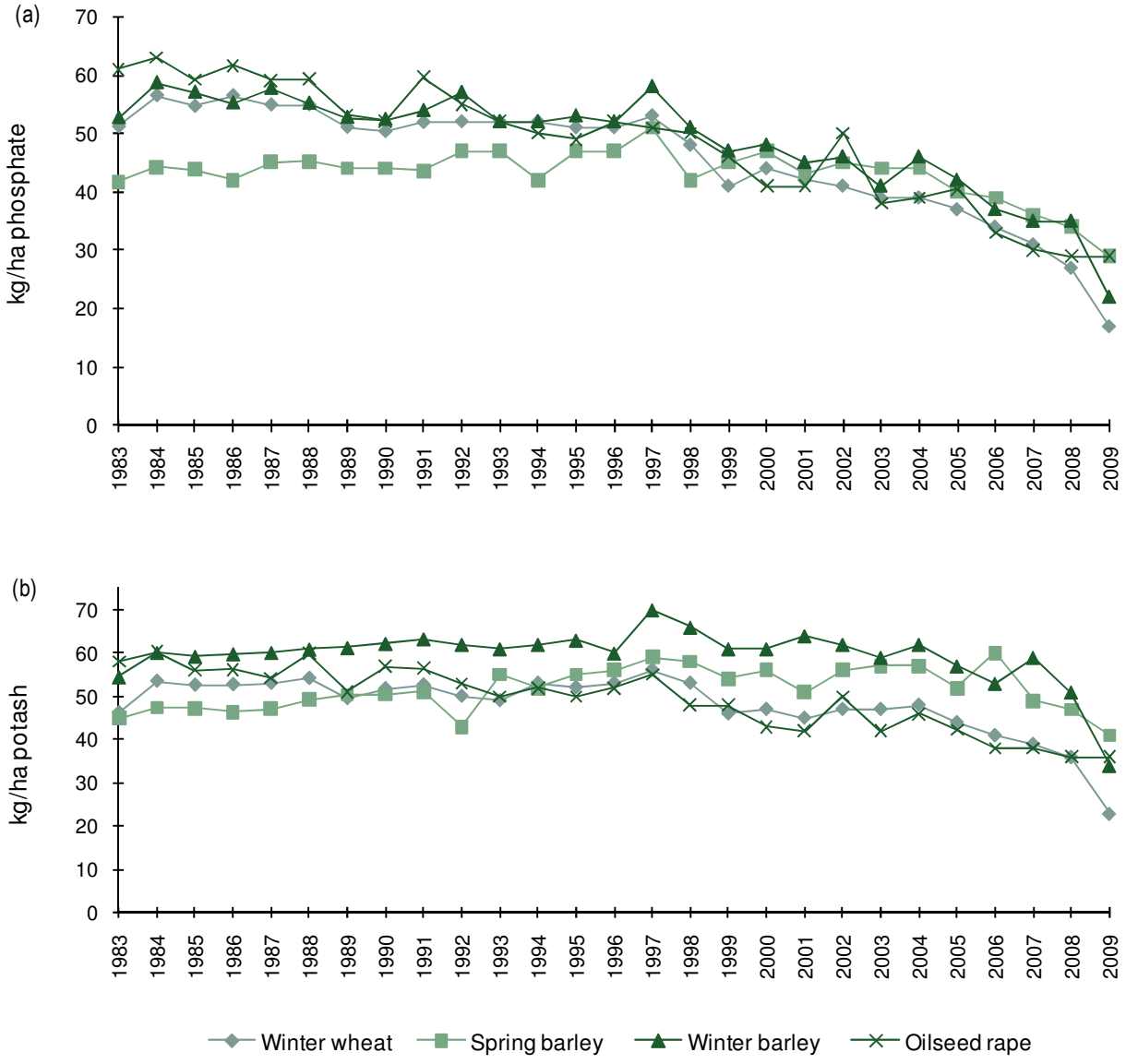
B2.2.1 Phosphate and potash use on major tillage crops

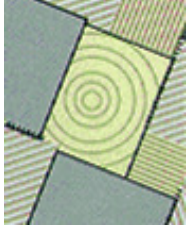
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

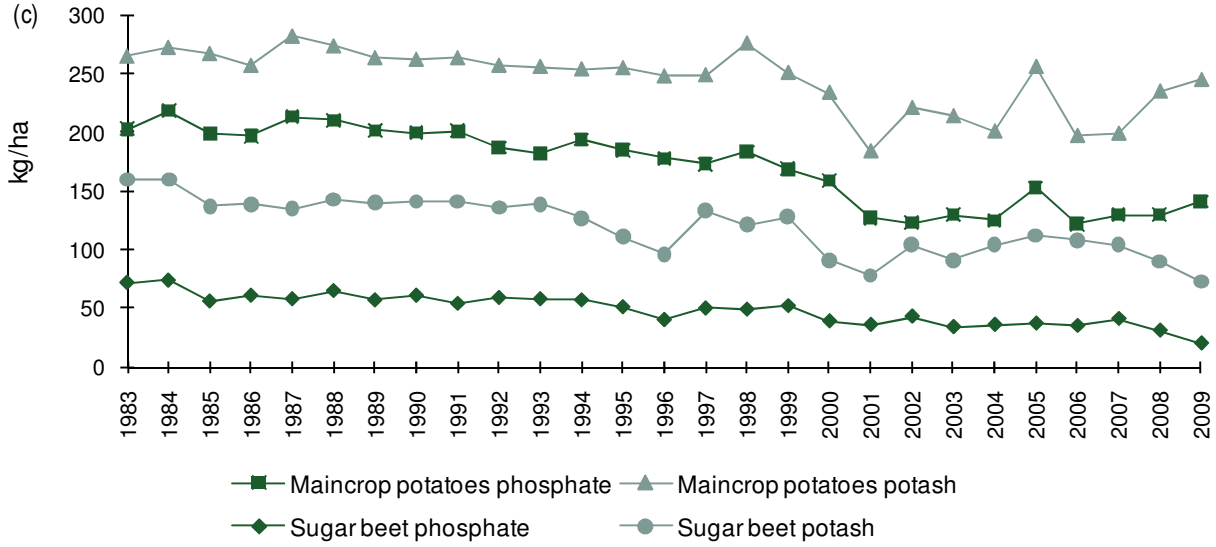
Phosphate use on most major tillage crops has shown a gradual net decline over the survey period. The net decline of phosphate on potatoes has been more dramatic, although it has stabilised in recent years.
Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.5(a)); the mean for the five year period 1998-2002 showed a drop to below 50 kg/ha for the first time in both crops (43 kg/ha for winter wheat and 47 kg/ha for winter barley). 2009 saw more marked decreases in overall rates (-10 kg/ha for winter wheat and -13 kg/ha for winter barley). This trend gives rates of 29 and 34 kg/ha for winter wheat and winter barley respectively for the 2005-2009 period. In contrast however, phosphate use rose slightly on spring barley between 1983 and 1997, but has declined since then. Overall phosphate use has also declined on oilseed rape, maincrop potatoes and sugar beet with means for 1983-87 of 61, 206 and 64 kg/ha, respectively declining to 46, 152 and 44 in 1998-2002. Rates in general have continued to decline between 2005-2009, except in potatoes where the rate increased has increased since 2006.

On winter wheat, the mean overall potash rates were very similar for the five year periods 1983-87, 1988-92 and 1993-97 at 52, 52 and 53 kg/ha, respectively but there was a reduction to 48 kg/ha in 1998-2002. For barley, the same periods have seen an increase in potash use from 59 kg/ha (winter barley) and 47 kg/ha (spring barley) in 1983-87 to 63 and 55 kg/ha in 1998-2002. The corresponding means for oilseed rape, maincrop potatoes and sugar beet show decreases from 57, 269 and 146 kg/ha in 1983-1987 to levels of 46, 230 and 102 kg/ha for the 1998-2002 period. Rates in 2005-2009 indicate that the downward trend is continuing (mean: 36, 226, 97 kg/ha).

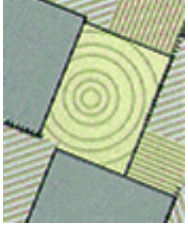
Figure B2.5 Overall application rates (kg/ha) of (a) phosphate and (b) potash on major arable crops, and (c) phosphate and potash on sugar beet and potatoes Great Britain 1983 – 2009







Much of the long term reduction in the overall rates of application of phosphate and potash to combinable arable crops results from a decrease in the dressing cover, but this has been compounded in 2009 by reduced average field rates.



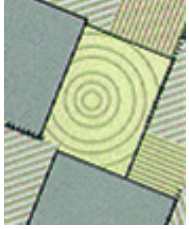
SECTION C – TABLES

CONTENTS

GREAT BRITAIN TABLES 2009

ENGLAND AND WALES TABLES 2009

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



SCOTLAND TABLES 2009

Note: 1. Row percentages may not sum to exactly to 100 due to rounding.
2. No estimates are shown for crops with less 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 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	91	26	39	37	147	45	60	135	12	23	68
Winter wheat	99	31	32	13	190	54	72	188	17	23	1681
Spring barley	97	62	67	28	103	48	61	100	29	41	851
Winter barley	99	42	48	15	142	53	72	140	22	34	592
Oats	87	37	43	19	103	50	65	90	18	28	219
Rye/triticale/Durum wheat	72	13	14	19	142	34	35	102	5	5	28
Potatoes (seed or earlies)	87	87	87	20	147	164	211	128	144	185	26
Potatoes (maincrop)	93	89	90	31	181	159	272	168	141	245	123
Sugar beet	96	41	67	36	98	47	109	94	20	73	131
Spring oilseed rape	94	23	22	12	120	43	63	113	10	14	41
Winter oilseed rape	100	39	36	13	190	54	67	189	21	24	523
Linseed	96	39	40	23	76	44	48	74	17	19	45
Forage maize	74	53	46	87	61	56	82	45	30	38	210
Rootcrops for stockfeed	91	76	80	62	66	76	82	61	58	66	74
Leafy forage crops	65	46	51	42	58	30	32	38	14	16	53
Arable silage/other fodder crops	34	26	27	45	86	56	70	29	15	19	64
Peas - human consumption	0	22	21	0	0	82	79	0	18	16	48
Peas - animal consumption	1	23	33	9	24	59	71	0	14	24	67
Beans - animal consumption	3	20	20	6	96	54	66	3	11	14	204
Vegetables (brassicae)	95	88	86	12	163	64	122	155	56	106	47
Vegetables (other)	57	53	56	16	129	77	108	73	41	61	89
Soft Fruit	59	32	86	0	61	87	81	36	28	70	10
Top Fruit	89	36	56	2	73	89	123	65	32	69	40
Other tillage	31	15	12	15	96	60	76	29	9	9	75
All tillage	90	40	43	20	156	57	77	139	23	33	5309
Grass under 5 years old	77	52	56	43	117	29	42	90	15	24	974
Grass 5 years and over	55	35	35	35	92	21	26	50	7	9	2394
All grass	59	38	39	37	98	23	30	57	9	12	3368
All crops and grass	74	39	41	28	131	39	54	97	15	22	8677

Source: British Survey of Fertiliser Practice 2009

Table GB1.2 Use of straight fertiliser, Great Britain 2009

	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	88	1	13	145	31	64	128	0	9	68
Winter wheat	96	7	9	187	58	81	180	4	7	1681
Spring barley	74	3	9	94	51	77	69	2	7	851
Winter barley	95	4	9	137	66	87	129	2	8	592
Oats	75	4	11	107	61	85	81	3	9	219
Rye/triticale/Durum wheat	61	0	0	157	0	0	95	0	0	28
Potatoes (seed or earlies)	23	0	13	60	0	210	14	0	27	26
Potatoes (maincrop)	41	3	18	121	171	232	50	6	41	123
Sugar beet	94	3	29	95	47	107	90	1	31	131
Spring oilseed rape	87	4	4	123	31	61	107	1	3	41
Winter oilseed rape	99	6	8	184	68	78	182	4	6	523
Linseed	96	0	1	76	0	49	72	0	1	45
Forage maize	37	3	18	80	57	108	30	2	20	210
Rootcrops for stockfeed	27	3	8	63	14	111	17	0	9	74
Leafy forage crops	24	0	0	68	0	0	16	0	0	53
Arable silage/other fodder crops	20	0	1	82	87	82	16	0	1	64
Peas - human consumption	0	9	8	0	120	84	0	11	6	48
Peas - animal consumption	1	4	15	24	68	79	0	3	11	67
Beans - animal consumption	2	6	7	108	36	72	2	2	5	204
Vegetables (brassicae)	35	9	9	95	67	159	33	6	15	47
Vegetables (other)	40	6	10	134	49	116	53	3	11	89
Soft Fruit	27	0	54	65	0	75	17	0	41	10
Top Fruit	87	24	39	73	120	149	64	29	58	40
Other tillage	25	3	0	106	76	75	26	3	0	75
All tillage	81	5	10	155	61	90	125	3	9	5309
Grass under 5 years old	41	1	2	107	55	104	44	0	2	974
Grass 5 years and over	25	0	1	98	56	72	25	0	0	2394
All grass	28	0	1	100	56	87	28	0	1	3368
All crops and grass	53	3	5	140	61	90	75	2	5	8677

Source: British Survey of Fertiliser Practice 2009

Table GB1.3 Use of compound fertiliser, Great Britain 2009

	Crop area receiving dressing (%)			Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	16	25	25	45	46	58	7	11	15	68
Winter wheat	10	24	23	72	53	66	7	13	15	1681
Spring barley	51	59	59	61	47	57	31	28	34	851
Winter barley	16	39	39	64	51	68	10	20	26	592
Oats	17	33	33	55	48	56	9	16	18	219
Rye/triticale/Durum wheat	11	13	14	61	34	35	7	5	5	28
Potatoes (seed or earlies)	87	87	74	131	164	211	114	144	157	26
Potatoes (maincrop)	85	86	81	140	157	253	118	135	204	123
Sugar beet	11	39	41	41	47	102	5	18	42	131
Spring oilseed rape	8	19	18	78	46	63	6	9	11	41
Winter oilseed rape	19	32	29	36	52	62	7	17	18	523
Linseed	5	39	39	28	44	48	1	17	19	45
Forage maize	42	51	31	35	56	59	15	28	18	210
Rootcrops for stockfeed	68	72	72	64	79	79	44	57	57	74
Leafy forage crops	45	46	51	49	30	32	22	14	16	53
Arable silage/other fodder crops	18	25	26	71	56	68	13	14	18	64
Peas - human consumption	0	13	13	0	56	76	0	7	10	48
Peas - animal consumption	0	19	19	0	57	65	0	11	12	67
Beans - animal consumption	1	14	14	72	63	63	1	9	9	204
Vegetables (brassicae)	84	84	83	145	60	110	122	50	91	47
Vegetables (other)	25	47	47	80	81	106	20	38	49	89
Soft Fruit	32	32	32	57	87	91	19	28	30	10
Top Fruit	11	12	17	15	28	65	2	3	11	40
Other tillage	10	11	11	35	55	76	4	6	9	75
All tillage	21	35	34	65	56	72	14	19	24	5309
Grass under 5 years old	52	52	54	89	29	40	46	15	21	974
Grass 5 years and over	36	35	35	71	20	25	26	7	9	2394
All grass	39	38	39	76	22	29	29	8	11	3368
All crops and grass	30	36	36	72	38	48	22	14	17	8677

Source: British Survey of Fertiliser Practice 2009

Table GB1.4 Use of lime, Great Britain 2009

	Crop area receiving dressing (%)						Average application rate (tonnes of product/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	0.5	7.1	1.9	0.4	1.9	11.9	6.0	8.1	5.0	6.4	4.3	6.9	8	68
Winter wheat	3.0	1.6	0.2	0.4	0.6	5.9	2.8	7.6	5.0	16.3	2.5	5.2	99	1681
Spring barley	6.7	0.3	3.9	-	2.3	13.2	4.2	4.9	4.4	-	1.2	3.8	117	851
Winter barley	2.8	0.5	1.1	-	0.7	5.1	4.5	5.0	4.2	-	1.8	4.1	32	592
Oats	1.7	0.2	-	-	1.1	3.0	3.7	5.0	-	-	2.5	3.4	8	219
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	28
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	123
Sugar beet	3.3	5.7	-	12.0	-	21.0	4.5	3.9	-	7.0	-	5.7	28	131
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	41
Winter oilseed rape	5.1	1.5	-	0.2	2.0	8.8	3.5	5.0	-	6.7	1.2	3.3	38	523
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	4	45
Forage maize	8.7	2.4	0.4	0.5	6.1	18.1	3.6	12.2	3.8	10.0	3.2	4.8	40	210
Rootcrops for stockfeed	11.2	-	1.6	-	6.1	18.9	4.9	-	5.0	-	2.5	4.1	14	74
Leafy forage crops	8.5	-	-	-	12.0	20.5	6.2	-	-	-	7.7	7.1	9	53
Arable silage/other fodder crops	7.4	2.7	4.8	-	7.7	22.7	5.9	5.4	5.0	-	2.8	4.6	22	64
Peas - human consumption	1.0	1.0	-	5.8	3.0	10.9	6.3	4.0	-	6.9	4.5	5.9	5	48
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	4	67
Beans - animal consumption	3.1	0.8	0.2	0.5	0.2	4.9	4.7	0.7	5.0	6.0	2.5	4.1	10	204
Vegetables (brassicae)	9.9	-	-	-	10.4	20.3	5.0	-	-	-	1.8	3.4	11	47
Vegetables (other)	4.3	2.5	-	1.3	0.4	8.4	2.1	2.0	-	4.0	0.4	2.3	8	89
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	4	40
Other tillage	1.8	-	-	4.3	-	6.0	1.3	-	-	3.0	-	2.5	5	75
All tillage	4.0	1.4	0.9	0.7	1.4	8.5	3.8	6.1	4.5	9.0	2.2	4.4	468	5309
Grass under 5 years old	3.4	0.3	0.8	0.2	1.8	6.4	5.0	4.6	4.3	3.0	2.8	4.2	83	974
Grass 5 years and over	1.6	-	0.8	-	1.3	3.8	4.5	-	3.2	-	2.9	3.7	115	2394
All grass	1.9	0.1	0.8	0.1	1.4	4.3	4.7	5.3	3.3	3.3	2.9	3.8	198	3368
All crops and grass	3.0	0.7	0.9	0.4	1.4	6.3	4.1	6.1	3.9	8.5	2.5	4.2	666	8677

Source: British Survey of Fertiliser Practice 2009

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	50	33	32	22	79	18	20	39	6	6	1536
Grazed mown	71	45	48	59	114	27	39	81	12	19	1420
All grazings	58	37	38	36	95	22	29	55	8	11	2956
Cut for silage - grazed	83	54	58	70	121	27	40	100	14	23	1030
Cut for silage - not grazed	90	66	68	60	138	32	48	124	21	33	238
All cut for silage	84	56	60	68	124	28	42	104	15	25	1268
Cut for hay - grazed	47	24	25	34	81	25	30	38	6	8	433
Cut for hay - not grazed	65	42	45	14	87	28	42	57	12	19	118
All cut for hay	49	27	28	32	82	26	33	40	7	9	552
All mowings	73	47	50	57	116	28	41	85	13	20	1764
All grass	59	38	39	37	98	23	30	57	9	12	3368

Source: British Survey of Fertiliser Practice 2009

Table GB3.0 Product use by month of application, Great Britain 2009

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total product ('000 tonnes)
Straight N	0	0	0	0	0	6	31	41	15	5	2	1	2143
Straight P	18	7	5	0	4	5	30	15	6	2	1	7	41
Straight K	5	5	2	3	6	13	45	12	6	1	0	2	119
Compounds	5	4	1	0	1	4	25	31	15	7	3	3	1291
All fertilisers	2	2	0	0	1	5	29	36	15	6	2	2	3605

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total nutrient ('000 tonnes)
Nitrogen	0	0	0	0	0	5	29	40	16	6	2	1	933
Phosphate	9	6	1	1	2	6	27	26	12	3	2	4	149
Potash	7	5	1	1	3	9	27	25	11	5	2	3	213
Total	3	2	0	0	1	5	29	36	15	5	2	2	1295

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

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2009.

'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, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2009

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2009

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	37.2	53.5	10.8	25.8	51.8	20.5	44.4	32.8	34.9	31.1	59.3	33.0	41.7
Urea	4.6	11.0	0.1	2.3	13.7	1.5	8.7	3.3	5.2	2.7	5.1	3.4	7.4
Calcium Ammonium Nitrate (CAN)	3.7	2.0	0.0	1.3	1.5	0.8	1.9	2.9	1.8	2.9	0.0	2.8	2.1
Urea Ammonium Nitrate (UAN)	4.2	7.8	1.0	4.2	6.2	1.9	6.0	0.5	1.4	0.4	0.0	0.5	4.7
Other Straight N	0.7	2.0	0.3	0.0	6.1	0.2	2.1	0.4	0.0	0.2	0.0	0.4	1.7
Triple Superphosphate (TSP)	0.6	1.1	0.8	0.3	1.3	2.1	1.1	0.5	0.7	0.5	1.6	0.5	1.0
Other Straight P	0.1	0.1	0.0	0.9	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash (MOP)	2.3	2.2	7.7	2.0	1.5	5.4	2.7	0.6	1.3	0.9	1.1	0.7	2.3
Other Straight K	0.6	1.3	1.9	22.6	0.7	1.4	1.9	0.4	0.6	0.4	5.7	0.4	1.6
PK	7.7	9.5	4.1	29.6	7.5	12.7	9.6	2.1	4.7	2.5	2.2	2.1	7.9
NK	2.9	1.5	1.3	1.7	1.0	2.0	1.7	4.5	2.9	6.4	0.0	4.6	2.4
Low N (<19% N)	16.0	3.0	67.0	5.6	5.0	37.4	12.2	3.2	4.6	2.9	23.5	3.8	10.2
High N (>=19% N)	18.8	4.0	4.1	0.1	2.0	9.9	6.1	48.3	41.6	48.5	1.6	47.3	15.8
Other	0.8	0.8	0.9	3.7	1.6	4.0	1.3	0.5	0.2	0.6	0.0	0.5	1.1
Total product ('000 tonnes)	**359**	**1466**	**101**	**88**	**368**	**152**	**2535**	**948**	**97**	**574**	**4**	**1070**	**3605**

Source: British Survey of Fertiliser Practice 2009

Table GB3.2 Use of product type by crop group, Great Britain 2009

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not specified	all grass	total product ('000 tonnes)
Ammonium Nitrate	11.0	66.9	0.8	1.8	16.1	3.3	77.6	89.4	10.6	51.8	0.4	22.4	1472
Urea	6.6	70.1	0.1	0.6	21.6	1.0	88.5	85.6	14.0	41.1	2.2	11.5	331
Calcium Ammonium Nitrate (CAN)	25.1	50.3	0.0	4.7	17.3	2.5	60.3	86.3	4.5	55.3	0.0	39.7	78
Urea Ammonium Nitrate (UAN)	8.0	70.0	0.5	2.3	17.2	2.0	97.7	97.0	11.8	34.4	0.0	2.3	181
Other Straight N	6.0	61.6	0.8	0.0	31.1	0.5	90.6	100.0	0.0	35.2	0.0	9.4	46
Triple Superphosphate (TSP)	6.4	60.5	2.9	0.6	15.0	14.6	87.4	78.1	12.8	61.9	0.6	12.6	38
Other Straight P	16.4	45.3	0.0	32.9	0.2	5.2	100.0	0.0	0.0	0.0	0.0	0.0	4
Muriate of Potash (MOP)	15.7	47.3	6.2	3.0	9.1	18.6	92.7	71.6	15.7	68.0	10.5	7.3	63
Other Straight K	2.5	57.2	3.2	33.1	1.5	2.4	95.3	83.6	12.8	84.8	8.1	4.7	57
PK	10.8	51.6	1.4	12.5	11.1	12.6	94.7	74.4	28.7	63.3	1.5	5.3	251
NK	29.8	50.0	1.7	3.1	10.9	4.4	41.0	87.3	7.1	79.3	0.0	59.0	90
Low N (<19% N)	30.8	13.5	32.3	1.0	7.2	15.2	88.7	85.7	8.3	46.7	1.2	11.3	273
High N (>=19% N)	45.1	38.1	1.3	0.0	3.3	12.1	18.1	89.0	7.9	52.9	0.1	81.9	669
Other	13.7	48.8	1.6	9.9	13.1	12.8	87.3	92.3	1.0	65.1	0.0	12.7	53
All Fertilisers	**14.2**	**57.8**	**4.0**	**3.5**	**14.5**	**6.0**	**70.3**	**88.5**	**9.1**	**53.6**	**0.4**	**29.7**	**3605**

Source: British Survey of Fertiliser Practice 2009

Table GB3.3 Product use by month of application, Great Britain 2009

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	4.7	28.9	40.3	17.7	4.9	1.6	0.8	0.6	0.3	0.1	0.0	1472
Urea	0.2	9.4	35.9	37.6	9.5	5.6	1.5	0.2	0.1	0.1	0.0	0.0	331
Calcium Ammonium Nitrate (CAN)	0.0	5.8	32.9	37.8	14.8	5.8	2.2	0.7	0.0	0.0	0.0	0.0	78
Urea Ammonium Nitrate (UAN)	0.0	5.4	26.3	51.2	13.6	1.8	0.9	0.3	0.2	0.1	0.0	0.0	181
Other Straight N	0.0	9.4	45.1	37.5	1.7	5.3	0.3	0.0	0.0	0.0	0.0	0.0	46
Triple Superphosphate (TSP)	4.4	5.2	27.5	15.9	5.3	1.7	1.4	8.0	19.8	5.4	5.0	0.3	38
Other Straight P	0.1	0.6	51.4	7.3	13.2	0.0	0.0	0.0	0.2	27.3	0.0	0.0	4
Muriate of Potash (MOP)	4.2	19.2	32.5	17.3	8.2	1.9	0.7	2.1	7.2	4.5	1.9	0.3	63
Other Straight K	7.8	7.0	59.2	6.3	2.8	0.1	0.0	1.3	1.5	4.8	2.3	6.9	57
PK	6.2	12.9	21.0	6.9	1.8	0.2	0.2	8.7	21.6	15.6	2.9	1.9	251
NK	0.0	5.0	18.7	25.8	15.3	24.4	7.0	3.7	0.1	0.0	0.0	0.0	90
Low N (<19% N)	0.5	5.1	35.0	32.6	16.7	1.6	0.9	2.2	3.0	1.9	0.2	0.2	273
High N (>=19% N)	0.0	0.8	23.5	39.5	19.0	10.4	4.9	1.4	0.2	0.2	0.0	0.0	669
Other	1.0	8.2	39.4	30.9	8.3	0.2	3.9	3.3	1.7	3.0	0.0	0.1	53
All Fertilisers	**0.8**	**5.5**	**29.1**	**35.7**	**14.8**	**5.5**	**2.1**	**1.7**	**2.4**	**1.7**	**0.4**	**0.3**	**3605**

Source: British Survey of Fertiliser Practice 2009

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	96	19	38	44	158	60	68	152	11	26	31
Winter wheat	99	32	30	12	196	55	71	194	18	22	950
Spring barley	96	59	66	14	108	51	66	104	30	43	288
Winter barley	99	39	44	7	142	55	72	140	22	32	250
Oats	91	28	34	14	109	51	65	99	14	22	103
Rye/triticale/Durum wheat	61	7	7	31	153	44	44	93	3	3	9
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	3
Potatoes (maincrop)	90	72	72	18	242	173	268	217	125	193	14
Sugar beet	95	34	70	18	109	61	122	103	21	85	43
Spring oilseed rape	93	23	22	13	132	48	72	122	11	16	34
Winter oilseed rape	99	37	34	10	190	53	66	189	20	22	319
Linseed	96	29	30	28	76	50	45	73	14	14	34
Forage maize	87	51	37	77	72	50	65	63	26	24	28
Rootcrops for stockfeed	100	44	63	19	67	35	96	67	15	60	14
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	7	21	21	8	108	83	111	7	17	23	12
Peas - human consumption	0	13	6	0	0	59	61	0	8	4	11
Peas - animal consumption	2	31	31	9	24	62	63	0	19	19	41
Beans - animal consumption	2	22	22	6	121	57	68	2	13	15	138
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetables (other)	0	21	23	6	0	80	63	0	17	14	14
Soft Fruit	-	-	-	-	-	-	-	-	-	-	1
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	23	17	13	20	85	53	35	20	9	5	26
All tillage	90	36	37	13	169	55	71	152	20	26	2367
Grass under 5 years old	62	37	43	14	103	34	50	64	12	22	167
Grass 5 years and over	39	14	15	6	76	30	33	30	4	5	415
All grass	44	20	21	8	85	31	41	37	6	9	582
All crops and grass	82	33	34	12	162	52	68	133	17	23	2949

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

Source: British Survey of Fertiliser Practice 2009

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	80	24	27	5	138	46	93	110	11	25	17
Winter wheat	98	26	31	7	178	54	76	174	14	23	452
Spring barley	99	50	57	16	111	48	69	110	24	39	212
Winter barley	99	48	57	3	138	50	75	137	24	43	172
Oats	92	55	63	5	108	59	83	100	32	52	35
Rye/triticale/Durum wheat	84	0	0	0	164	0	0	138	0	0	10
Potatoes (seed or earlies)	97	97	97	30	140	158	212	137	154	207	16
Potatoes (maincrop)	93	91	93	31	176	160	277	164	145	257	100
Sugar beet	99	47	67	41	93	42	102	92	20	68	83
Spring oilseed rape	100	26	26	12	61	19	19	61	5	5	6
Winter oilseed rape	100	45	43	17	192	56	64	192	25	28	156
Linseed	98	65	65	12	77	38	52	75	25	34	11
Forage maize	73	33	21	55	41	84	91	30	28	19	24
Rootcrops for stockfeed	100	97	97	86	84	85	108	84	82	105	7
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	40	18	18	82	68	57	57	28	10	10	10
Peas - human consumption	0	29	30	0	0	86	80	0	25	24	35
Peas - animal consumption	0	17	26	6	0	50	100	0	9	26	19
Beans - animal consumption	1	11	12	5	43	55	68	0	6	8	40
Vegetables (brassicae)	94	86	84	5	178	71	135	168	61	114	37
Vegetables (other)	75	63	68	15	132	79	115	98	49	79	58
Soft Fruit	61	34	89	0	61	87	81	37	29	73	9
Top Fruit	88	39	53	2	74	89	124	65	34	65	39
Other tillage	43	12	11	5	106	76	147	46	9	16	44
All tillage	90	41	47	13	149	67	101	135	28	47	1594
Grass under 5 years old	51	28	32	20	91	38	50	46	11	16	108
Grass 5 years and over	45	21	22	21	93	26	26	42	6	6	179
All grass	47	24	26	20	92	32	38	44	8	10	287
All crops and grass	83	38	43	14	144	63	94	119	24	41	1881

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 2009

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	100	26	35	66	94	26	38	94	7	13	6
Winter wheat	94	34	36	52	157	44	65	147	15	23	64
Spring barley	95	63	61	79	84	36	43	80	23	26	75
Winter barley	100	53	49	54	127	39	53	127	21	26	27
Oats	100	31	31	43	103	33	44	103	10	14	9
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	3
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	4
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	100	46	46	24	197	20	56	197	9	26	7
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	76	72	57	90	53	59	87	40	42	50	85
Rootcrops for stockfeed	100	100	100	78	82	66	82	82	66	82	5
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	4
Arable silage/other fodder crops	80	44	45	87	89	41	47	71	18	21	18
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetables (other)	70	70	46	100	81	44	41	57	31	19	9
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	87	55	50	71	101	47	64	88	26	32	321
Grass under 5 years old	88	56	58	78	153	32	48	135	18	28	224
Grass 5 years and over	87	46	49	61	134	24	35	116	11	17	489
All grass	87	48	51	65	138	26	38	120	13	20	713
All crops and grass	87	49	51	66	133	30	42	115	15	22	1034

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

Source: British Survey of Fertiliser Practice 2009

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	-	-	-	-	-	-	-	-	-	-	4
Winter wheat	99	33	54	64	178	53	79	176	17	43	24
Spring barley	97	84	86	66	79	43	43	76	36	37	128
Winter barley	95	49	62	65	124	62	71	117	30	44	43
Oats	91	86	93	44	75	48	56	69	41	52	21
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	1
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	54	36	44	92	67	35	73	37	13	32	25
Rootcrops for stockfeed	97	87	89	66	60	79	71	58	69	63	32
Leafy forage crops	69	47	55	49	56	30	33	38	14	18	34
Arable silage/other fodder crops	53	33	41	73	84	51	65	44	17	27	12
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	3
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	87	63	70	65	95	47	53	82	30	37	339
Grass under 5 years old	82	66	69	42	97	27	35	79	18	24	285
Grass 5 years and over	47	37	37	35	70	19	22	33	7	8	1048
All grass	51	40	40	36	74	20	24	38	8	10	1333
All crops and grass	53	42	42	38	76	22	27	41	9	11	1672

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 2009

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	78	45	50	32	156	12	14	122	6	7	10
Winter wheat	99	38	44	28	185	50	66	184	19	29	191
Spring barley	100	76	80	49	94	46	56	94	35	45	147
Winter barley	97	36	39	40	155	53	68	151	19	26	100
Oats	65	40	41	37	84	39	51	55	16	21	51
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Potatoes (seed or earlies)	63	63	63	4	191	191	226	120	120	141	7
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	4
Sugar beet	-	-	-	-	-	-	-	-	-	-	4
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	29	32	38	173	67	96	173	19	31	38
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	69	31	36	94	71	55	85	49	17	31	48
Rootcrops for stockfeed	67	67	67	77	61	90	77	41	60	52	16
Leafy forage crops	59	49	49	40	64	29	32	38	14	16	11
Arable silage/other fodder crops	4	9	9	10	28	29	53	1	3	5	12
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	2
Peas - animal consumption	0	0	56	5	0	0	67	0	0	37	6
Beans - animal consumption	15	30	30	6	77	29	44	11	9	13	20
Vegetables (brassicae)	100	100	100	83	21	25	35	21	25	35	6
Vegetables (other)	31	31	31	23	97	97	97	30	30	30	5
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	-	-	-	-	-	-	-	-	-	-	3
All tillage	88	46	51	41	137	50	64	121	23	33	687
Grass under 5 years old	79	50	53	32	112	26	43	89	13	23	189
Grass 5 years and over	49	24	25	15	72	20	24	35	5	6	256
All grass	58	32	33	20	88	23	33	51	7	11	445
All crops and grass	71	38	41	29	114	37	50	81	14	20	1132

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

Source: British Survey of Fertiliser Practice 2009

Table EW1.1 Total fertiliser use, England & Wales 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Spring wheat	91	21	35	38	149	46	63	135	10	22	59
Winter wheat	99	29	29	14	190	53	70	187	16	21	1578
Spring barley	97	38	48	22	106	43	57	103	16	27	553
Winter barley	98	38	43	14	140	52	71	138	20	31	527
Oats	89	33	38	17	107	50	66	95	17	25	180
Rye/triticale/Durum wheat	72	14	14	19	141	34	35	101	5	5	26
Potatoes (seed or earlies)	100	100	100	38	170	168	232	170	168	232	16
Potatoes (maincrop)	92	87	88	34	184	159	274	169	138	242	107
Sugar beet	96	41	67	36	98	47	109	94	20	73	131
Spring oilseed rape	94	23	22	12	120	43	63	113	10	14	41
Winter oilseed rape	99	37	34	14	190	54	67	189	20	23	494
Linseed	96	39	40	23	76	44	48	74	17	19	45
Forage maize	73	52	45	88	61	56	84	45	29	37	206
Rootcrops for stockfeed	87	62	69	58	67	54	75	58	34	52	42
Leafy forage crops	56	37	43	39	55	23	25	31	9	11	38
Arable silage/other fodder crops	28	19	21	42	92	60	76	26	12	16	52
Vining peas (for human consumption)	0	23	22	0	0	83	80	0	20	18	43
Field peas (harvested dry)	1	23	34	9	24	60	72	0	14	24	63
Field beans (harvested dry)	3	20	21	6	96	54	66	3	11	14	197
Vegetables (brassicae)	95	87	86	9	164	64	123	155	56	106	46
Vegetable Other	55	51	55	17	130	73	104	72	37	57	82
Soft Fruit	54	24	85	0	63	38	71	34	9	60	6
Top Fruit	89	36	56	2	73	89	123	65	32	69	40
Other tillage	31	15	12	15	96	60	76	29	9	9	74
All tillage	89	34	37	18	161	57	79	143	19	29	4646
Grass less than five years old	71	42	46	46	123	29	43	87	12	20	712
Grass five years and over	52	31	31	36	92	20	26	48	6	8	2007
All grass	55	33	34	37	98	22	29	54	7	10	2719
All crops and grass	72	34	35	28	137	40	55	99	13	19	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.2 Use of straight fertiliser, England & Wales 2009

	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	89	1	14	145	31	65	129	0	9	59
Winter wheat	96	7	9	188	58	82	181	4	7	1578
Spring barley	82	3	10	104	55	80	85	2	8	553
Winter barley	95	4	9	137	68	89	130	3	8	527
Oats	80	5	12	112	61	83	89	3	10	180
Rye/triticale/Durum wheat	60	0	0	156	0	0	94	0	0	26
Potatoes (seed or earlies)	19	0	13	65	0	235	13	0	31	16
Potatoes (maincrop)	41	3	16	123	156	240	50	4	38	107
Sugar beet	94	3	29	95	47	107	90	1	31	131
Spring oilseed rape	87	4	4	123	31	61	107	1	3	41
Winter oilseed rape	99	6	8	185	68	78	183	4	6	494
Linseed	96	0	1	76	0	49	72	0	1	45
Forage maize	37	3	19	81	57	108	30	2	20	206
Rootcrops for stockfeed	41	5	12	63	14	111	26	1	14	42
Leafy forage crops	23	0	0	70	0	0	16	0	0	38
Arable silage/other fodder crops	20	0	2	84	87	82	17	0	1	52
Peas - human consumption	0	10	9	0	120	84	0	12	7	43
Peas - animal consumption	1	4	15	24	69	80	0	3	12	63
Beans - animal consumption	2	7	7	108	36	72	2	2	5	197
Vegetables (brassicae)	33	10	10	95	67	159	31	6	15	46
Vegetables (other)	38	7	10	137	49	116	53	3	12	82
Soft Fruit	30	0	61	65	0	75	20	0	46	6
Top Fruit	87	24	39	73	120	149	64	29	58	40
Other tillage	25	3	0	106	76	75	26	3	0	74
All tillage	82	6	10	161	61	91	133	4	9	4646
Grass under 5 years old	45	1	2	111	55	111	50	1	3	712
Grass 5 years and over	26	0	1	101	56	67	27	0	0	2007
All grass	29	1	1	104	56	86	30	0	1	2719
All crops and grass	56	3	5	146	61	91	82	2	5	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.3 Use of compound fertiliser, England & Wales 2009

	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	15	20	21	41	46	62	6	9	13	59
Winter wheat	9	22	21	72	51	64	6	11	14	1578
Spring barley	27	35	38	66	42	50	18	15	19	553
Winter barley	13	34	34	67	50	66	9	17	22	527
Oats	11	28	28	55	48	56	6	13	16	180
Rye/triticale/Durum wheat	11	14	14	61	34	35	7	5	5	26
Potatoes (seed or earlies)	100	100	87	158	168	232	158	168	201	16
Potatoes (maincrop)	83	85	80	143	157	254	118	134	204	107
Sugar beet	11	39	41	41	47	102	5	18	42	131
Spring oilseed rape	8	19	18	78	46	63	6	9	11	41
Winter oilseed rape	17	31	27	38	51	62	6	16	16	494
Linseed	5	39	39	28	44	48	1	17	19	45
Forage maize	42	50	29	35	56	59	15	28	17	206
Rootcrops for stockfeed	50	56	56	64	58	68	32	33	38	42
Leafy forage crops	35	37	43	42	23	25	15	9	11	38
Arable silage/other fodder crops	11	19	20	80	60	74	9	11	15	52
Peas - human consumption	0	13	13	0	55	78	0	7	10	43
Peas - animal consumption	0	19	19	0	58	66	0	11	13	63
Beans - animal consumption	1	14	14	72	63	63	1	9	9	197
Vegetables (brassicae)	83	83	82	149	59	110	124	49	91	46
Vegetables (other)	22	45	45	85	76	102	19	34	46	82
Soft Fruit	24	24	24	60	38	60	14	9	14	6
Top Fruit	11	12	17	15	28	65	2	3	11	40
Other tillage	10	11	11	35	55	76	4	6	8	74
All tillage	15	28	27	69	55	72	10	16	20	4646
Grass under 5 years old	42	41	44	90	28	39	38	12	17	712
Grass 5 years and over	32	31	31	68	19	25	22	6	8	2007
All grass	34	32	33	72	21	28	24	7	9	2719
All crops and grass	24	30	30	71	37	48	17	11	14	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.4 Use of lime, England & Wales 2009

	Crop area receiving dressing (%)						Average application rate							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	0.6	7.7	2.0	0.5	0.6	11.4	6.0	8.1	5.0	6.4	2.5	7.1	7	59
Winter wheat	3.1	1.6	0.2	0.5	0.7	6.0	2.8	7.6	5.4	16.3	2.5	5.2	93	1578
Spring barley	3.5	0.6	0.9	-	1.3	6.3	5.3	4.9	4.1	-	2.4	4.5	47	553
Winter barley	2.8	0.6	1.2	-	0.8	5.4	4.7	5.0	4.2	-	1.8	4.2	30	527
Oats	0.6	0.3	-	-	1.3	2.2	5.0	5.0	-	-	2.5	3.5	6	180
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	1	107
Sugar beet	3.3	5.7	-	12.0	-	21.0	4.5	3.9	-	7.0	-	5.7	28	131
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	41
Winter oilseed rape	5.3	1.5	-	0.2	2.1	9.2	3.5	5.0	-	6.7	1.2	3.3	38	494
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	4	45
Forage maize	8.0	2.5	0.4	0.5	6.2	17.6	3.4	12.2	3.8	10.0	3.2	4.8	39	206
Rootcrops for stockfeed	14.9	-	-	-	6.5	21.4	5.0	-	-	-	3.4	4.5	10	42
Leafy forage crops	8.6	-	-	-	14.9	23.5	6.8	-	-	-	7.7	7.4	8	38
Arable silage/other fodder crops	6.1	3.0	4.1	-	6.6	19.9	6.2	5.4	5.0	-	3.6	4.9	16	52
Peas - human consumption	1.2	1.1	-	6.7	3.5	12.5	6.3	4.0	-	6.9	4.5	5.9	5	43
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	4	63
Beans - animal consumption	2.8	0.8	-	0.5	0.2	4.4	5.0	0.7	-	6.0	2.5	4.2	7	197
Vegetables (brassicae)	10.2	-	-	-	10.8	21.0	5.0	-	-	-	1.8	3.4	11	46
Vegetables (other)	4.1	2.6	-	1.4	0.4	8.5	0.5	2.0	-	4.0	0.4	1.5	7	82
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Top Fruit	-	-	-	-	-	-	-	-	-	-	-	-	4	40
Other tillage	1.8	-	-	4.3	-	6.1	1.3	-	-	3.0	-	2.5	5	74
All tillage	3.5	1.6	0.4	0.8	1.2	7.5	3.8	6.1	4.5	9.0	2.5	4.7	371	4646
Grass under 5 years old	4.4	0.4	0.4	0.3	2.1	7.5	5.0	4.6	4.1	3.0	3.3	4.4	62	712
Grass 5 years and over	1.7	-	0.8	-	1.3	3.8	4.5	-	2.7	-	3.2	3.7	96	2007
All grass	2.1	0.1	0.7	0.1	1.4	4.4	4.7	5.3	2.8	3.3	3.3	3.9	158	2719
All crops and grass	2.8	0.9	0.5	0.4	1.3	6.0	4.1	6.1	3.4	8.5	2.9	4.4	529	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	9	0	1	3	3	13	22	14	34	0	2	-	-	-	-	-	-	-	59
Winter wheat	1	0	1	3	3	3	7	16	22	25	10	6	3	1	-	-	-	-	1578
Spring barley	3	0	8	13	16	24	29	5	2	-	-	-	-	-	-	-	-	-	553
Winter barley	2	0	2	6	4	21	25	24	11	3	1	-	-	-	-	-	-	-	527
Oats	11	1	4	10	15	28	25	4	2	-	-	-	-	-	-	-	-	-	180
Rye/triticale/Durum wheat	28	2	4	0	6	3	28	4	11	13	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	0	0	2	0	2	16	1	24	15	39	-	-	-	-	-	-	-	-	16
Potatoes (maincrop)	8	1	1	0	7	5	11	12	23	16	10	1	1	0	2	0	2	1	107
Sugar beet	4	4	12	7	19	36	15	2	0	1	-	-	-	-	-	-	-	-	131
Spring oilseed rape	6	4	7	4	5	28	14	23	9	-	-	-	-	-	-	-	-	-	41
Winter oilseed rape	1	0	0	2	3	4	8	16	23	23	12	5	1	1	0	1	-	-	494
Linseed	4	1	22	11	48	16	-	-	-	-	-	-	-	-	-	-	-	-	45
Forage maize	27	20	15	13	8	10	7	1	-	-	-	-	-	-	-	-	-	-	206
Rootcrops for stockfeed	13	4	26	25	19	2	6	3	0	1	-	-	-	-	-	-	-	-	42
Leafy forage crops	44	8	12	21	16	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Arable silage/other fodder crops	72	0	3	4	8	10	3	-	-	-	-	-	-	-	-	-	-	-	52
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Peas - animal consumption	99	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63
Beans - animal consumption	97	0	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	197
Vegetables (brassicae)	5	7	7	0	0	15	6	9	23	2	13	4	1	6	-	-	-	-	46
Vegetables (other)	45	0	5	1	8	11	11	8	9	0	0	0	2	-	-	-	-	-	82
Soft Fruit	46	0	0	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Top Fruit	11	6	30	15	11	15	2	9	-	-	-	-	-	-	-	-	-	-	40
Other tillage	69	1	8	5	1	6	3	4	1	0	0	0	1	-	-	-	-	-	74
All tillage	11	1	3	5	6	10	12	13	14	14	6	3	1	1	-	-	-	-	4646
Grass under 5 years old	29	1	9	10	12	9	8	7	5	4	2	2	1	1	-	-	-	-	712
Grass 5 years and over	48	2	13	12	8	4	4	3	2	2	1	1	0	1	-	-	-	-	2007
All grass	45	2	12	12	9	5	5	4	2	2	1	1	0	1	-	-	-	-	2719
All crops and grass	28	1	8	8	7	7	8	8	8	8	4	2	1	1	-	-	-	-	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2009

	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	79	7	6	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	59
Winter wheat	71	4	10	10	4	1	-	-	-	-	-	-	-	-	-	-	-	-	1578
Spring barley	62	10	14	11	2	1	-	-	-	-	-	-	-	-	-	-	-	-	553
Winter barley	62	3	12	16	5	1	1	-	-	-	-	-	-	-	-	-	-	-	527
Oats	67	4	11	14	4	-	-	-	-	-	-	-	-	-	-	-	-	-	180
Rye/triticale/Durum wheat	86	4	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	0	0	14	3	2	5	1	24	3	39	0	0	0	0	8	-	-	-	16
Potatoes (maincrop)	13	1	7	6	5	4	20	4	15	9	13	2	-	-	-	-	-	-	107
Sugar beet	59	10	12	16	0	1	1	1	-	-	-	-	-	-	-	-	-	-	131
Spring oilseed rape	77	6	2	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Winter oilseed rape	63	5	11	13	5	1	-	-	-	-	-	-	-	-	-	-	-	-	494
Linseed	61	9	8	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
Forage maize	48	12	10	23	2	2	2	1	1	-	-	-	-	-	-	-	-	-	206
Rootcrops for stockfeed	38	13	19	11	13	2	4	-	-	-	-	-	-	-	-	-	-	-	42
Leafy forage crops	63	15	20	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Arable silage/other fodder crops	81	3	5	2	10	-	-	-	-	-	-	-	-	-	-	-	-	-	52
Peas - human consumption	77	0	5	10	3	2	0	0	4	-	-	-	-	-	-	-	-	-	43
Peas - animal consumption	77	1	5	12	2	3	-	-	-	-	-	-	-	-	-	-	-	-	63
Beans - animal consumption	80	5	4	7	0	4	-	-	-	-	-	-	-	-	-	-	-	-	197
Vegetables (brassicae)	13	15	27	6	6	32	0	2	-	-	-	-	-	-	-	-	-	-	46
Vegetables (other)	49	3	8	11	22	3	3	-	-	-	-	-	-	-	-	-	-	-	82
Soft Fruit	76	0	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Top Fruit	64	6	0	6	0	24	-	-	-	-	-	-	-	-	-	-	-	-	40
Other tillage	85	2	5	1	5	0	2	-	-	-	-	-	-	-	-	-	-	-	74
All tillage	66	5	10	12	4	1	1	-	-	-	-	-	-	-	-	-	-	-	4646
Grass under 5 years old	58	22	14	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	712
Grass 5 years and over	69	23	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2007
All grass	67	22	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2719
All crops and grass	66	14	9	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	7365

Source: British Survey of Fertiliser Practice 2009

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2009

	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	65	7	2	8	14	3	-	-	-	-	-	-	-	-	-	-	-	-	59
Winter wheat	71	4	5	7	8	5	1	1	-	-	-	-	-	-	-	-	-	-	1578
Spring barley	52	7	14	12	12	2	0	1	-	-	-	-	-	-	-	-	-	-	553
Winter barley	57	3	8	10	14	6	1	1	-	-	-	-	-	-	-	-	-	-	527
Oats	62	3	9	9	11	5	1	-	-	-	-	-	-	-	-	-	-	-	180
Rye/triticale/Durum wheat	86	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Potatoes (seed or earlies)	0	0	0	2	2	0	11	5	0	21	1	28	8	22	-	-	-	-	16
Potatoes (maincrop)	12	1	1	2	1	3	1	5	5	4	6	11	6	16	10	7	0	9	107
Sugar beet	33	2	4	8	12	18	12	6	1	1	0	1	0	0	0	0	1	-	131
Spring oilseed rape	78	4	5	6	4	1	3	-	-	-	-	-	-	-	-	-	-	-	41
Winter oilseed rape	66	3	7	9	11	2	1	-	-	-	-	-	-	-	-	-	-	-	494
Linseed	60	8	13	9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	45
Forage maize	55	7	3	8	11	5	1	9	1	-	-	-	-	-	-	-	-	-	206
Rootcrops for stockfeed	31	5	17	10	21	7	4	3	2	-	-	-	-	-	-	-	-	-	42
Leafy forage crops	57	15	25	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
Arable silage/other fodder crops	79	3	5	1	2	9	1	-	-	-	-	-	-	-	-	-	-	-	52
Peas - human consumption	78	1	5	2	10	5	-	-	-	-	-	-	-	-	-	-	-	-	43
Peas - animal consumption	66	2	4	11	11	3	0	3	-	-	-	-	-	-	-	-	-	-	63
Beans - animal consumption	79	3	4	4	3	6	-	-	-	-	-	-	-	-	-	-	-	-	197
Vegetables (brassicae)	14	9	4	0	5	33	6	5	17	6	-	-	-	-	-	-	-	-	46
Vegetables (other)	45	3	7	2	10	6	12	12	1	1	-	-	-	-	-	-	-	-	82
Soft Fruit	15	0	0	24	61	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Top Fruit	44	4	2	0	6	8	4	29	0	2	-	-	-	-	-	-	-	-	40
Other tillage	88	2	5	2	1	0	0	0	0	0	0	0	2	-	-	-	-	-	74
All tillage	63	4	7	8	9	5	1	2	-	-	-	-	-	-	-	-	-	-	4646
Grass under 5 years old	54	16	15	10	4	1	-	-	-	-	-	-	-	-	-	-	-	-	712
Grass 5 years and over	69	20	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2007
All grass	66	19	8	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2719
All crops and grass	65	12	7	6	5	3	1	1	-	-	-	-	-	-	-	-	-	-	7365

Source: British Survey of Fertiliser Practice 2009

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	46	28	27	23	82	17	19	37	5	5	1213
Grazed mown	69	41	43	60	111	26	38	77	11	16	1244
All grazings	55	33	34	38	97	21	29	53	7	10	2457
Cut for silage - grazed	81	51	54	72	119	26	39	96	13	21	878
Cut for silage - not grazed	85	45	52	46	150	28	38	127	13	20	117
All cut for silage	81	50	54	70	121	26	39	99	13	21	995
Cut for hay - grazed	46	22	22	34	80	25	29	37	5	7	403
Cut for hay - not grazed	57	32	36	10	90	30	44	51	10	16	89
All cut for hay	47	23	24	32	82	26	32	38	6	8	493
All mowings	69	41	43	58	113	26	38	79	11	17	1440
All grass	55	33	34	37	98	22	29	54	7	10	2719

Source: British Survey of Fertiliser Practice 2009

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	54	2	15	11	5	3	3	2	1	1	0	1	1	-	-	-	-	-	1213
Grazed mown	31	2	9	13	14	7	8	6	3	3	2	1	0	1	-	-	-	-	1244
All grazings	45	2	13	12	9	5	5	4	2	2	1	1	0	1	-	-	-	-	2457
Cut for silage - grazed	19	1	8	14	16	9	10	8	5	4	3	1	0	1	-	-	-	-	878
Cut for silage - not grazed	15	0	10	6	12	8	6	10	3	16	2	5	4	2	-	-	-	-	117
All cut for silage	19	1	8	13	16	9	9	8	4	5	3	2	0	1	-	-	-	-	995
Cut for hay - grazed	54	3	10	12	10	3	3	1	0	1	1	1	-	-	-	-	-	-	403
Cut for hay - not grazed	43	0	15	10	8	10	5	5	3	-	-	-	-	-	-	-	-	-	89
All cut for hay	53	3	10	12	10	4	3	2	0	1	1	1	-	-	-	-	-	-	493
All mowings	31	2	9	12	14	7	7	6	3	4	2	1	0	1	-	-	-	-	1440
All grass	45	2	12	12	9	5	5	4	2	2	1	1	0	1	-	-	-	-	2719

Source: British Survey of Fertiliser Practice 2009

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	72	22	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1213
Grazed mown	59	24	12	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1244
All grazings	67	23	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2457
Cut for silage - grazed	49	30	16	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	878
Cut for silage - not grazed	55	25	13	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	117
All cut for silage	50	30	15	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	995
Cut for hay - grazed	78	13	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	403
Cut for hay - not grazed	68	20	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
All cut for hay	77	14	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	493
All mowings	59	24	12	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1440
All grass	67	22	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2719

Source: British Survey of Fertiliser Practice 2009

Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2009

	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	73	20	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1213
Grazed mown	57	19	13	7	2	1	0	1	-	-	-	-	-	-	-	-	-	-	1244
All grazings	66	20	9	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2457
Cut for silage - grazed	46	23	16	9	3	2	0	1	-	-	-	-	-	-	-	-	-	-	878
Cut for silage - not grazed	48	23	11	13	2	2	0	1	-	-	-	-	-	-	-	-	-	-	117
All cut for silage	46	23	16	9	3	2	0	1	-	-	-	-	-	-	-	-	-	-	995
Cut for hay - grazed	78	12	6	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	403
Cut for hay - not grazed	64	19	3	6	5	2	0	1	-	-	-	-	-	-	-	-	-	-	89
All cut for hay	76	13	5	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	493
All mowings	57	19	12	7	2	1	0	1	-	-	-	-	-	-	-	-	-	-	1440
All grass	66	19	8	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2719

Source: British Survey of Fertiliser Practice 2009

Table EW3.0 Product use by month of application, England & Wales 2009

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	total product ('000 tonnes)
Straight N	0	0	0	0	0	6	32	40	15	5	1	1	1961
Straight P	19	8	5	0	4	5	28	14	6	2	1	8	39
Straight K	5	5	2	4	5	14	47	10	5	1	0	2	110
Compounds	6	5	1	0	1	6	27	24	16	7	3	4	895
All fertilisers	3	2	0	0	1	6	31	34	15	5	2	2	3017

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total nutrient ('000 tonnes)
Nitrogen	0	0	0	0	0	5	31	39	16	5	2	1	803
Phosphate	11	7	2	1	3	7	27	20	12	3	2	6	108
Potash	9	7	2	1	3	11	28	19	11	4	2	4	158
Total	3	2	0	0	1	6	30	34	15	5	2	2	1069

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

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2009.

'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, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2009

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2009

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	47.5	55.0	12.0	25.8	51.7	23.2	47.3	37.4	38.5	37.8	59.3	39.1	45.6
Urea	5.7	11.6	0.2	2.3	14.0	1.7	9.5	3.9	6.2	3.1	5.1	4.0	8.3
Calcium Ammonium Nitrate (CAN)	3.4	1.7	0.0	1.3	1.3	0.8	1.6	2.2	1.9	1.7	0.0	1.9	1.7
Urea Ammonium Nitrate (UAN)	4.1	8.1	1.0	4.2	6.6	2.0	6.4	0.5	1.7	0.4	0.0	0.5	5.2
Other Straight N	0.9	2.0	0.2	0.0	6.2	0.2	2.2	0.5	0.0	0.3	0.0	0.5	1.8
Triple Superphosphate (TSP)	0.4	1.1	0.7	0.3	1.4	2.4	1.2	0.6	0.8	0.7	1.6	0.7	1.1
Other Straight P	0.1	0.1	0.0	0.9	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash (MOP)	2.5	2.2	8.8	2.0	1.5	6.3	2.9	0.8	1.4	1.2	1.1	0.9	2.5
Other Straight K	0.7	1.3	1.8	22.6	0.8	1.6	2.1	0.2	0.7	0.3	5.7	0.4	1.7
PK	8.8	9.0	5.1	29.6	7.4	14.1	9.8	2.1	5.3	2.4	2.2	2.1	8.2
NK	4.0	1.5	1.6	1.7	1.1	2.3	1.8	5.2	3.5	7.3	0.0	5.3	2.5
Low N (<19% N)	5.2	1.7	62.3	5.6	4.3	31.8	8.8	2.7	3.7	2.1	23.5	3.2	7.6
High N (>=19% N)	15.9	3.7	5.2	0.1	2.0	9.5	5.1	43.6	36.1	42.4	1.6	41.0	12.6
Other	0.7	0.8	1.2	3.7	1.7	3.9	1.4	0.3	0.2	0.3	0.0	0.3	1.2
Total product ('000 tonnes)	**194**	**1369**	**80**	**88**	**354**	**141**	**2225**	**738**	**83**	**423**	**4**	**792**	**3017**

Source: British Survey of Fertiliser Practice 2009

Table EW3.2 Use of product type by crop group, England & Wales 2009

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not specified	all grass	total product ('000 tonnes)
Ammonium Nitrate	8.2	68.8	0.7	2.0	16.8	3.5	78.3	90.5	11.4	51.8	0.5	21.7	1350
Urea	5.6	70.8	0.1	0.6	21.9	1.1	89.5	91.9	15.9	38.1	2.5	10.5	317
Calcium Ammonium Nitrate (CAN)	14.9	53.9	0.0	6.7	21.2	3.3	67.7	99.6	8.4	53.4	0.0	32.3	49
Urea Ammonium Nitrate (UAN)	6.6	70.7	0.4	2.4	18.0	1.8	97.9	96.6	13.6	24.3	0.0	2.1	172
Other Straight N	5.5	60.8	0.2	0.0	32.9	0.6	90.1	100.0	0.0	34.0	0.0	9.9	43
Triple Superphosphate (TSP)	3.1	62.7	2.0	0.7	15.9	15.5	86.7	78.1	12.8	61.9	0.6	13.3	36
Other Straight P	16.4	45.3	0.0	32.9	0.2	5.2	100.0	0.0	0.0	0.0	0.0	0.0	4
Muriate of Potash (MOP)	11.8	49.1	5.5	3.3	9.8	20.5	92.3	74.5	15.7	67.2	10.9	7.7	57
Other Straight K	1.9	57.7	2.2	34.2	1.5	2.5	97.3	69.6	23.7	79.1	15.0	2.7	54
PK	8.3	50.6	1.6	14.0	11.9	13.6	95.6	76.7	36.3	57.9	2.0	4.4	221
NK	27.3	49.1	2.0	3.8	12.5	5.3	41.2	93.1	8.5	77.3	0.0	58.8	75
Low N (<19% N)	8.1	14.3	44.0	1.7	10.7	21.3	87.9	94.7	10.4	45.1	2.0	12.1	156
High N (>=19% N)	27.2	49.0	2.0	0.0	4.8	17.0	18.2	96.0	8.9	53.8	0.1	81.8	434
Other	12.1	49.2	1.7	10.4	13.7	12.9	92.7	90.1	2.0	42.9	0.0	7.3	48
All Fertilisers	**8.7**	**61.5**	**3.6**	**3.9**	**15.9**	**6.3**	**73.8**	**93.2**	**10.5**	**53.4**	**0.5**	**26.2**	**3017**

Source: British Survey of Fertiliser Practice 2009

Table EW3.3 Product use by month of application, England & Wales 2009

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.0	4.9	29.9	39.7	17.5	4.8	1.5	0.8	0.6	0.3	0.0	0.0	1350
Urea	0.2	9.4	36.3	37.1	9.6	5.5	1.5	0.2	0.1	0.1	0.0	0.0	317
Calcium Ammonium Nitrate (CAN)	0.0	6.3	40.3	37.2	8.4	4.7	2.9	0.1	0.0	0.0	0.0	0.0	49
Urea Ammonium Nitrate (UAN)	0.0	5.7	26.5	51.2	13.4	1.9	0.5	0.3	0.2	0.1	0.0	0.0	172
Other Straight N	0.0	9.2	44.2	38.6	1.7	5.0	0.3	0.0	0.0	0.0	0.0	0.0	43
Triple Superphosphate (TSP)	4.6	5.5	25.3	15.0	5.6	1.8	1.5	8.4	20.9	5.7	5.3	0.3	36
Other Straight P	0.1	0.6	51.4	7.3	13.2	0.0	0.0	0.0	0.2	27.3	0.0	0.0	4
Muriate of Potash (MOP)	4.6	21.1	31.9	15.1	8.1	1.4	0.8	2.1	7.9	4.6	2.1	0.4	57
Other Straight K	6.2	7.3	62.3	5.1	1.4	0.2	0.0	1.2	1.6	5.0	2.5	7.2	54
PK	5.3	12.6	21.4	6.1	1.8	0.2	0.2	9.5	22.0	16.6	3.0	1.3	221
NK	0.0	6.0	19.2	22.4	16.2	25.5	6.2	4.2	0.1	0.0	0.0	0.0	75
Low N (<19% N)	0.9	6.9	35.3	25.8	18.7	2.3	0.8	3.1	3.3	2.1	0.4	0.4	156
High N (>=19% N)	0.0	1.2	28.1	33.4	21.8	8.7	4.8	1.6	0.2	0.1	0.1	0.0	434
Other	1.2	9.1	43.4	29.8	6.3	0.1	1.6	3.1	1.9	3.4	0.0	0.1	48
All Fertilisers	**0.7**	**6.1**	**30.7**	**33.9**	**14.8**	**5.0**	**1.9**	**1.8**	**2.6**	**1.9**	**0.4**	**0.3**	**3017**

Source: British Survey of Fertiliser Practice 2009

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2009

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
North West	All tillage	96	35	56	59	126	43	73	121	15	41	115
	All grass	77	53	59	55	107	21	31	83	11	18	286
	All crops and grass	81	50	58	56	111	23	38	90	12	22	401
North East	All tillage	90	37	41	17	170	60	77	153	22	31	211
	All grass	44	34	36	28	70	23	29	31	8	10	182
	All crops and grass	63	35	38	23	129	39	50	81	14	19	393
Eastern	All tillage	91	32	27	10	162	58	85	148	19	23	942
	All grass	32	8	10	13	100	46	63	32	3	6	125
	All crops and grass	83	29	25	10	159	58	84	133	17	21	1067
Yorkshire and the Humber	All tillage	94	33	37	15	165	54	80	154	18	30	706
	All grass	55	25	24	33	108	21	30	60	5	7	266
	All crops and grass	80	30	33	22	151	44	66	120	13	22	972
West Midlands	All tillage	85	34	49	22	154	68	95	131	23	47	424
	All grass	55	28	28	38	93	21	27	51	6	8	270
	All crops and grass	68	31	37	31	127	44	67	86	13	25	694
East Midlands	All tillage	90	29	29	13	174	58	82	156	17	24	747
	All grass	49	12	16	27	89	19	27	44	2	4	196
	All crops and grass	80	25	26	17	161	54	74	129	13	19	943
South West	All tillage	84	48	49	34	136	53	64	114	25	31	696
	All grass	55	28	29	48	109	26	35	60	8	10	680
	All crops and grass	65	35	36	43	121	39	49	79	14	17	1376
South East	All tillage	85	29	35	14	172	56	78	146	16	27	653
	All grass	35	11	12	10	92	28	34	32	3	4	282
	All crops and grass	65	22	26	12	156	51	70	102	11	18	935
Wales	All tillage	78	59	66	60	96	49	61	74	29	40	152
	All grass	63	51	50	40	91	19	24	57	10	12	432
	All crops and grass	64	52	51	42	92	21	28	59	11	14	584

Source: British Survey of Fertiliser Practice 2009

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2009

		Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
		N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Wessex	All tillage	82	45	49	29	154	50	65	126	22	32	381
	All grass	40	13	12	46	98	35	36	39	5	4	276
	All crops and grass	59	28	29	38	134	46	59	79	13	17	657
Anglia	All tillage	91	32	27	10	162	58	85	148	19	23	942
	All grass	32	8	10	13	100	46	63	32	3	6	125
	All crops and grass	83	29	25	10	159	58	84	133	17	21	1067
Northern	All tillage	91	35	45	28	142	48	68	129	17	31	194
	All grass	65	48	51	52	102	22	32	67	11	16	333
	All crops and grass	72	45	50	46	115	27	40	82	12	20	527
North East	All tillage	93	35	40	17	167	55	80	156	19	32	804
	All grass	56	30	30	30	98	21	28	55	6	8	357
	All crops and grass	78	33	36	22	147	42	62	115	14	22	1161
North Mercia	All tillage	90	38	54	39	137	67	96	124	25	52	210
	All grass	64	39	41	47	94	19	26	61	7	11	182
	All crops and grass	73	39	45	45	111	34	52	80	13	24	392
South Mercia	All tillage	83	28	38	17	158	66	89	131	18	34	311
	All grass	43	15	16	21	101	24	32	43	4	5	170
	All crops and grass	64	22	28	19	140	52	74	90	11	20	481
East Midland	All tillage	90	29	29	13	174	58	82	156	17	24	747
	All grass	49	12	16	27	89	19	27	44	2	4	196
	All crops and grass	80	25	26	17	161	54	74	129	13	19	943
South East	All tillage	85	29	35	14	172	56	78	146	16	27	653
	All grass	35	11	12	10	92	28	34	32	3	4	282
	All crops and grass	65	22	26	12	156	51	70	102	11	18	935
South West	All tillage	89	64	60	52	101	56	64	90	36	39	252
	All grass	68	41	42	53	113	25	35	77	10	15	366
	All crops and grass	73	46	46	53	110	34	43	80	16	20	618
Wales	All tillage	78	59	66	60	96	49	61	74	29	40	152
	All grass	63	51	50	40	91	19	24	57	10	12	432
	All crops and grass	64	52	51	42	92	21	28	59	11	14	584

Source: British Survey of Fertiliser Practice 2009

Table SC1.1 Total fertiliser use, Scotland 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Winter wheat	100	77	90	6	192	67	81	192	52	73	103
Spring barley	98	93	92	37	98	50	63	96	46	59	298
Winter barley	100	81	87	25	151	56	75	151	45	65	65
Oats	78	58	64	31	79	49	62	62	28	40	39
Potatoes	92	92	92	11	153	159	240	140	145	220	26
Winter oilseed rape	100	84	84	10	173	55	65	173	46	55	29
Other crops	70	69	70	38	81	76	78	57	53	54	103
All tillage	95	86	88	30	118	57	73	113	49	64	663
Grass less than five years old	90	76	79	37	107	30	42	96	23	33	262
Grass five years and over	66	53	54	31	89	22	28	59	12	15	387
All grass	72	59	61	33	95	25	33	69	15	20	649
All crops and grass	81	69	71	32	105	39	51	84	27	36	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.2 Use of straight fertiliser, Scotland 2009

	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	93	4	16	170	65	79	158	3	13	103
Spring barley	64	3	8	76	47	71	49	1	6	298
Winter barley	94	2	9	136	41	68	127	1	6	65
Oats	54	0	6	71	0	105	38	0	7	39
Potatoes	40	5	22	101	201	202	40	9	44	26
Winter oilseed rape	100	1	7	154	41	59	154	0	4	29
Other crops	24	1	1	100	59	51	24	0	1	103
All tillage	67	3	9	104	57	82	70	2	7	663
Grass less than five years old	32	0	2	93	0	77	30	0	1	262
Grass five years and over	20	0	0	78	0	121	16	0	0	387
All grass	23	0	1	83	0	92	19	0	1	649
All crops and grass	39	1	4	96	57	84	37	1	3	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.3 Use of compound fertiliser, Scotland 2009

	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	46	72	74	74	67	82	34	49	60	103
Spring barley	82	89	86	58	50	61	48	45	53	298
Winter barley	43	79	79	57	56	74	24	44	59	65
Oats	43	58	58	57	49	57	24	28	33	39
Potatoes	87	87	77	115	156	228	100	136	175	26
Winter oilseed rape	70	83	77	27	55	66	19	45	51	29
Other crops	57	68	68	59	76	78	33	52	54	103
All tillage	71	83	81	60	57	70	42	47	57	663
Grass less than five years old	77	76	78	87	30	41	67	23	32	262
Grass five years and over	53	53	54	81	22	28	43	12	15	387
All grass	60	59	61	83	25	32	50	15	20	649
All crops and grass	63	68	68	74	39	48	47	26	33	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.4 Use of lime, Scotland 2009

	Crop area receiving dressing (%)						Average application rate							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Winter wheat	1.1	-	2.5	-	0.3	3.9	5.0	-	4.4	-	5.0	4.6	6	103
Spring barley	10.8	-	7.9	-	3.5	22.2	3.7	-	4.5	-	0.7	3.5	70	298
Winter barley	-	-	-	-	-	-	-	-	-	-	-	-	2	65
Oats	-	-	-	-	-	-	-	-	-	-	-	-	2	39
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Other crops	9.6	-	2.8	-	4.8	17.2	5.4	-	5.0	-	1.9	4.4	17	103
All tillage	8.0	-	5.4	-	2.5	15.9	3.8	-	4.5	-	0.9	3.6	97	663
Grass less than five years old	0.9	-	1.7	-	1.2	3.8	4.4	-	4.3	-	0.9	3.2	21	262
Grass five years and over	1.6	-	1.1	-	1.0	3.7	4.4	-	4.7	-	0.7	3.5	19	387
All grass	1.4	-	1.2	-	1.1	3.7	4.4	-	4.6	-	0.8	3.4	40	649
All crops and grass	3.7	-	2.7	-	1.6	8.0	3.9	-	4.5	-	0.9	3.5	137	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	0	0	0	1	2	4	8	11	35	29	6	1	0	0	3	-	-	-	103
Spring barley	2	1	5	11	30	39	9	4	-	-	-	-	-	-	-	-	-	-	298
Winter barley	0	0	0	0	7	16	28	32	12	4	1	-	-	-	-	-	-	-	65
Oats	22	4	17	13	18	13	8	5	-	-	-	-	-	-	-	-	-	-	39
Potatoes	8	0	5	1	21	4	28	2	8	5	15	2	0	0	2	-	-	-	26
Winter oilseed rape	0	0	0	0	12	3	4	22	23	31	5	-	-	-	-	-	-	-	29
Other crops	30	2	14	22	15	7	1	6	1	2	1	-	-	-	-	-	-	-	103
All tillage	5	1	5	9	22	27	10	8	7	5	1	-	-	-	-	-	-	-	663
Grass less than five years old	10	2	8	18	17	13	11	10	4	3	3	0	0	1	-	-	-	-	262
Grass five years and over	34	0	15	23	7	6	6	1	4	3	1	0	1	-	-	-	-	-	387
All grass	28	0	13	22	10	8	7	4	4	3	1	0	1	-	-	-	-	-	649
All crops and grass	19	1	10	17	14	15	8	5	5	4	1	-	-	-	-	-	-	-	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	23	5	14	33	21	0	0	0	3	-	-	-	-	-	-	-	-	-	103
Spring barley	7	8	35	43	6	1	-	-	-	-	-	-	-	-	-	-	-	-	298
Winter barley	19	6	26	34	16	-	-	-	-	-	-	-	-	-	-	-	-	-	65
Oats	42	10	19	19	10	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Potatoes	8	0	2	1	7	9	22	12	19	15	0	4	-	-	-	-	-	-	26
Winter oilseed rape	16	2	25	45	12	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Other crops	31	8	15	14	16	4	7	2	2	1	1	-	-	-	-	-	-	-	103
All tillage	14	7	28	37	10	1	1	0	1	1	-	-	-	-	-	-	-	-	663
Grass less than five years old	24	30	38	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	262
Grass five years and over	47	32	17	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	387
All grass	41	31	23	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	649
All crops and grass	31	23	25	16	4	1	-	-	-	-	-	-	-	-	-	-	-	-	1312

Source: British Survey of Fertiliser Practice 2009

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2009

	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	10	4	12	17	35	16	4	0	1	-	-	-	-	-	-	-	-	-	103
Spring barley	8	4	20	40	22	3	4	-	-	-	-	-	-	-	-	-	-	-	298
Winter barley	13	5	11	19	37	11	3	-	-	-	-	-	-	-	-	-	-	-	65
Oats	36	9	14	15	17	5	4	-	-	-	-	-	-	-	-	-	-	-	39
Potatoes	8	0	0	3	6	0	2	0	22	21	3	4	0	12	0	15	2	2	26
Winter oilseed rape	16	2	16	45	8	14	-	-	-	-	-	-	-	-	-	-	-	-	29
Other crops	30	5	17	17	14	5	5	3	4	-	-	-	-	-	-	-	-	-	103
All tillage	12	4	17	32	23	6	4	0	1	1	-	-	-	-	-	-	-	-	663
Grass less than five years old	21	23	30	14	8	2	1	-	-	-	-	-	-	-	-	-	-	-	262
Grass five years and over	46	28	19	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	387
All grass	39	27	22	7	3	1	1	-	-	-	-	-	-	-	-	-	-	-	649
All crops and grass	29	19	20	16	10	3	2	-	-	-	-	-	-	-	-	-	-	-	1312

Source: British Survey of Fertiliser Practice 2009

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2009

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	63	50	51	20	72	20	21	45	10	11	323
Grazed mown	89	75	82	53	127	30	44	114	23	36	176
All grazings	69	56	58	28	89	23	29	61	13	17	499
Cut for silage - grazed	93	76	84	55	134	32	47	124	24	39	152
Cut for silage - not grazed	93	81	80	70	131	34	53	122	27	43	121
All cut for silage	93	78	83	61	132	33	49	123	26	41	273
Cut for hay - grazed	65	63	63	32	82	25	34	53	16	21	30
Cut for hay - not grazed	97	81	82	27	82	25	40	79	20	33	29
All cut for hay	75	68	69	31	82	25	36	61	17	25	59
All mowings	91	77	81	57	127	32	47	115	24	38	324
All grass	72	59	61	33	95	25	33	69	15	20	649

Source: British Survey of Fertiliser Practice 2009

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2009

	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	37	1	17	27	7	4	5	1	0	1	-	-	-	-	-	-	-	-	323
Grazed mown	11	0	6	9	10	20	14	8	8	5	5	0	2	-	-	-	-	-	176
All grazings	31	0	14	23	8	8	7	2	2	2	1	-	-	-	-	-	-	-	499
Cut for silage - grazed	7	0	6	5	12	20	17	9	10	6	5	0	2	-	-	-	-	-	152
Cut for silage - not grazed	7	1	2	12	22	11	6	12	16	5	4	0	2	-	-	-	-	-	121
All cut for silage	7	0	4	8	16	16	12	10	12	6	5	0	2	-	-	-	-	-	273
Cut for hay - grazed	35	0	9	28	4	19	2	0	3	-	-	-	-	-	-	-	-	-	30
Cut for hay - not grazed	3	0	16	33	13	28	1	3	2	1	-	-	-	-	-	-	-	-	29
All cut for hay	25	0	11	29	6	22	2	1	3	-	-	-	-	-	-	-	-	-	59
All mowings	9	0	5	11	15	17	11	9	11	5	4	0	2	-	-	-	-	-	324
All grass	28	0	13	22	10	8	7	4	4	3	1	0	1	-	-	-	-	-	649

Source: British Survey of Fertiliser Practice 2009

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2009

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	50	32	16	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	323
Grazed mown	25	28	39	6	1	1	-	-	-	-	-	-	-	-	-	-	-	-	176
All grazings	44	31	21	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	499
Cut for silage - grazed	24	27	41	6	1	1	-	-	-	-	-	-	-	-	-	-	-	-	152
Cut for silage - not grazed	19	31	34	12	4	1	0	1	-	-	-	-	-	-	-	-	-	-	121
All cut for silage	22	28	38	9	2	1	-	-	-	-	-	-	-	-	-	-	-	-	273
Cut for hay - grazed	37	32	26	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Cut for hay - not grazed	19	45	34	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	29
All cut for hay	32	36	29	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	59
All mowings	23	30	37	8	2	1	-	-	-	-	-	-	-	-	-	-	-	-	324
All grass	41	31	23	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	649

Source: British Survey of Fertiliser Practice 2009

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2009

	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	49	30	18	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	323
Grazed mown	18	23	31	14	8	4	3	-	-	-	-	-	-	-	-	-	-	-	176
All grazings	42	29	21	5	2	1	1	-	-	-	-	-	-	-	-	-	-	-	499
Cut for silage - grazed	16	20	33	15	8	5	3	-	-	-	-	-	-	-	-	-	-	-	152
Cut for silage - not grazed	20	16	26	21	10	4	0	2	0	0	1	-	-	-	-	-	-	-	121
All cut for silage	17	18	30	18	9	4	2	1	-	-	-	-	-	-	-	-	-	-	273
Cut for hay - grazed	37	32	16	5	8	0	1	-	-	-	-	-	-	-	-	-	-	-	30
Cut for hay - not grazed	18	27	33	19	1	1	-	-	-	-	-	-	-	-	-	-	-	-	29
All cut for hay	31	30	22	10	6	0	1	-	-	-	-	-	-	-	-	-	-	-	59
All mowings	19	21	29	16	9	4	2	1	-	-	-	-	-	-	-	-	-	-	324
All grass	39	27	22	7	3	1	1	-	-	-	-	-	-	-	-	-	-	-	649

Source: British Survey of Fertiliser Practice 2009

Table SC3.0 Product use by month of application, Scotland 2009

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total product ('000 tonnes)
Straight N	0	0	0	0	0	4	20	46	20	6	3	1	182
Straight P	0	0	0	0	0	0	69	31	0	0	0	0	2
Straight K	0	3	0	0	13	0	25	36	16	4	0	3	9
Compounds	2	1	0	1	1	2	21	45	13	9	4	1	396
All fertilisers	1	1	0	0	1	3	21	45	15	8	3	1	588

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total nutrient ('000 tonnes)
Nitrogen	0	0	0	0	0	2	19	48	16	9	4	1	130
Phosphate	4	3	0	1	2	3	26	41	11	4	2	1	42
Potash	4	2	0	1	3	3	25	41	11	6	2	1	55
Total	2	1	0	1	1	2	22	45	14	8	3	1	226

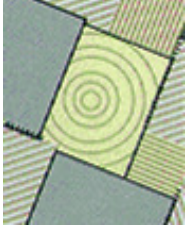
Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2009.

'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, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2009



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2009

Introduction

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

D1 FARMS HANDLING ORGANIC MANURES

Organic manures applied to agricultural land may be produced on farm by livestock as slurries, farmyard manure (FYM) and poultry manures or imported from other sources such as treated sewage sludges (also called bio-solids) and some industrial 'wastes' such as paper waste or brewery effluent.

Of the 1373 farms in the survey, around two thirds (909) used organic manures on at least one field on the farm, the details are shown in Table D1.1a.

Table D1.1a Numbers and percentage (%) of farms using each type of manure in Great Britain, 2009

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm*	*bio-solids*	*other non-farm*
Farms in sample	464	701	235	33	14	32	43	39	8	57	19
Farms in population	28624	47247	15384	1834	565	1546	1701	3029	630	2072	968
Farms in population %	32%	53%	17%	2%	1%	2%	2%	3%	1%	2%	1%
Volume ('000,000 t; m^3)	n/a	36.8	41.1	1.1	0.8	0.6	0.7	0.5	0.9	2.8	1.4
Volume %	n/a	42%	47%	1%	1%	1%	1%	1%	1%	3%	2%

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

Table D1.1b Percentage (%) of farms using each type of manure in Great Britain, 2005 - 2009

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2005	31	58	19	1	1	2	3	4	3
2006	30	59	19	2	1	2	2	3	3
2007	33	56	20	1	1	2	2	2	3
2008	31	55	18	3	1	2	3	5	4
2009	32	53	17	2	1	2	2	3	4

Cattle manure from beef and dairy farms is by far the largest volume of manure type generated in Great Britain. The percentage of farms using cattle FYM has declined by 5% since 2005, whereas the use of cattle slurry has remained more consistent, and is at 17% of farms in 2009. Not all the manure generated by a farm is retained for use by that farm and excess manure/slurry can be exported for use elsewhere. Details of estimates of manure exports are given in Table D1.2a.

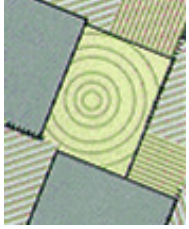


Table D1.2a Estimated volume of exported manures, Great Britain 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*layer manure*	*broiler/ turkey litter*	*other*	*total*
Farms in sample	21	5	0	1	2	0	28
Farms in population	1261	308	-	-	-	-	1640
Exported volume ('000,000 t; m^3)	0.8	0.5	-	-	-	-	1.3
Average volume per farm (t; m^3)	612	1651	-	-	-	-	792

Note: some farmers exported more than one type of manure

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

Table D1.2b Percentage (%) of farms exporting manures of each type, Great Britain 2005 - 2009

	cattle FYM	*cattle slurry*	*other*	*farms in population*
2005	1.7	0.5	0.3	90787
2006	1.6	0.2	0.2	90549
2007	1.3	0.6	0.3	91361
2008	1.7	0.5	1.0	89241
2009	1.4	0.3	0.1	89404

The percentage of farms exporting cattle manures is reasonably consistent over the five year period 2005 – 2009. Exports of other types of manures remain at a low level, and appear more variable over the period, but overall the number of exporting farms in the sample is low.

Of the farms surveyed, 909 reported use of either farm or non-farm manure and, of these, 179 had imported some/all of it. The details are given in Tables D1.3a/b.

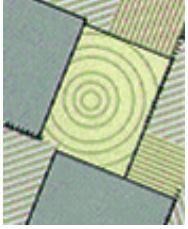
Table D1.3a Number of farms importing farm manures (solids and liquids), showing quantity imported, Great Britain 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*total*
Farms in sample	40	3	17	7	24	35	3	1	111
Farms in population	2356	-	748	353	1071	1416	-	-	5635
Imported volume ('000,000 t; m^3)	1.4	-	0.5	0.1	0.3	0.5	-	-	3.0
Average volume per farm (t; m^3)	602	-	605	383	297	343	-	-	538

Table D1.3b Number of farms importing non-farm manures (solids and liquids), showing quantity imported, Great Britain 2009

	bio-solids	*other non-farm manure*	*total*
Farms in sample	49	20	68
Farms in population	1923	1034	2935
Imported volume ('000,000 t; m^3)	3.8	1.8	5.7
Average volume per farm (t; m^3)	1988	1773	1927

Note: some farmers imported more than one type of manure



The amount of imported non-farm manures has increased each year since 2003 to 5.7 million tonnes in 2009. This is attributable to both an increase in usage per farm (1927 tonnes;m^3 compared with 1070 tonnes; m^3 in 2003) and to a substantial increase in the number of farms importing (68 compared with 23 in 2003). Cattle FYM and poultry manure continued to be the farm produced manures most likely to be imported.

Table D1.3c Percentage (%) of farms importing manures of each type, Great Britain 2005 - 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*	*farms in population*
2005	1.9	0.1	0.4	0.1	1.1	1.9	0.1	2.7	90787
2006	2.1	0.1	0.4	0.0	0.8	2.1	0.3	3.3	90549
2007	2.6	0.6	0.5	0.4	1.1	1.7	0.1	3.2	91361
2008	2.8	0.4	0.5	0.2	1.4	2.0	0.4	3.3	89241
2009	2.6	0.2	0.8	0.4	1.2	1.6	0.2	3.3	89404

The percentage of farms importing cattle FYM and other manures have increased since 2005 and have stabilised at 2.6% and 3.3% of farms respectively in 2009. The other types of manure shown in the table are imported to a lesser degree and show greater fluctuations during the period.

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

Table D1.4 Number and percentage (%) of farms using each type of application method by slurry type, Great Britain 2009

			percentage of farms					
slurry type	*farms in sample*	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry	235	15384	88	9	6	1	1	1
Pig slurry	14	565	77	10	4	0	0	9
Both	1	22	-	-	-	-	-	-
Grand Total	248	15927	88	9	6	1	1	1

Whilst some of these application methods (e.g. shallow injection or deep injection) apply slurry below the surface of the field, the majority require secondary cultivation to incorporate the manure/slurry into the soil. Assessment of how often organic manures are incorporated into the soil is complicated by the fact that some farmers make more than one application or apply more than one type of manure and may incorporate each of these differently. As manure on grass fields is seldom incorporated (unless they are destined for re-seeding), grass fields have been excluded from the incorporation analysis.

Table D1.5 gives estimates of the volume and area of manure/slurry incorporation on tillage fields by manure type and immediacy of incorporation. Farm yard manure is the most extensively incorporated at 95% of the area with 80% of it incorporated within a week of spreading on tillage fields. Cattle slurry is less likely to be incorporated at 84% of the volume and this incorporation tends to be later than for FYM, with 20% of the volume incorporated after one week.

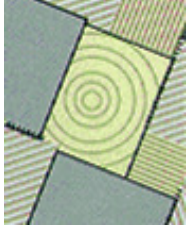


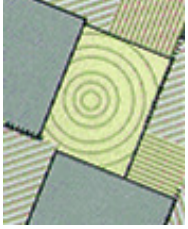
Table D1.5 Percentage of incorporated of organic manure volume and area on tillage fields by incorporation time and manure/slurry type, Great Britain 2009

	incorporation time after spreading										*total*	
	not incorporated		*within 6 hours*		*between 6 and 24 hours*		*between 1 and 7 days*		*more than 1 week*		*applied area*	*volume applied*
	%area	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*'000 ha*	*'000,000t;m^3*
FYM	5	5	6	6	25	25	48	49	14	14	604	14.8
Cattle slurry	18	16	13	17	14	16	36	31	19	20	113	3.8
Pig slurry	12	5	0	0	24	36	53	54	11	5	14	0.5
Poultry FYM	2	1	21	29	57	51	19	18	2	1	129	1.2
Other	2	4	28	22	41	42	26	26	3	5	152	3.8
Total	6	7	12	11	30	28	40	41	11	12	1013	24.1

Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor (Table D1.6). The percentage of farmers using a contractor to spread at least some of thier FYM and cattle slurry is consistent with previous years at 32% and 29% respectively. Where contractors were used they were applying between 81% and 97% of the manure.

Table D1.6 Use of contractors to spread manure/slurry in current season, Great Britain 2009

	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	32	24	81
Cattle slurry	29	27	89
Other	54	52	97
Total	32	28	86



D2 USE OF ORGANIC MANURES

The proportion of the sown area 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 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*	*total*
% of sown area	16	8	0	0	1	1	1	0	1	0	27
% of sown area where organic manure is applied	59	30	2	1	2	3	2	1	5	2	100

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

Table D2.1b Percentage of sown area receiving each organic manure type, Great Britain 2005 - 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2005	19	9	0	0	1	1	1	1
2006	20	9	1	1	1	1	1	2
2007	16	9	0	0	1	1	0	1
2008	15	9	1	0	1	1	1	2
2009	16	8	0	0	1	1	1	2

Table D2.1c Percentage of sown area where organic manure is applied receiving each organic manure type, Great Britain 2005 – 2009

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2005	67	33	2	2	2	3	4	4
2006	65	31	2	2	2	3	3	6
2007	62	36	2	2	3	2	1	5
2008	56	33	3	2	3	5	4	7
2009	59	30	2	1	2	3	2	8

The percentage of the sown area receiving an application of cattle FYM has declined slightly since 2005 to 16%. Looking across the sown area where an organic manure has been applied the trend is for declining applications for all types, the exception being cattle FYM which increased to 59% of the area receiving an application of an organic manure (Table 2.1c).

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

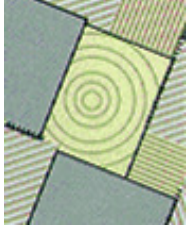


Table D2.2 Typical dry matter and nutrient content of different organic manure types[11]

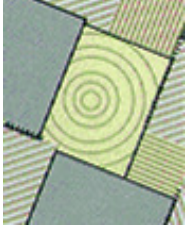
	dry matter (%)	*total N (kg/t; kg/m^3)*	*total P_2O_5 (kg/t; kg/m^3)*	*total K_2O (kg/t; kg/m^3)*
Cattle FYM	25	6.0	3.5	8.0
Pig FYM	25	7.0	7.0	5.0
Sheep FYM	25	6.0	2.0	3.0
Duck manure	25	6.5	5.5	7.5
Layer hen manure	30	16.0	13.0	9.0
Broiler/turkey litter	60	30.0	25.0	18.0
Cattle slurry	6	2.7	1.2	3.1
Pig slurry	4	4.0	2.0	2.5
Digested liquid sewage sludge	4	2.0	1.5	-
Digested cake	25	7.5	9.0	-
Thermally dried	95	35.0	45.0	-
Lime stabilised	40	6.0	8.0	-
Composted green manure	65	7.0	2.8	5.3

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 D2.3 Treated areas and average manure application rates to winter sown and spring sown crops and grassland by manure type, Great Britain 2009

	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 %	6.2	1.0	0.6	0.3	1.2	1.5	0.1	-	2.6	0.8
Avg manure rate (t; m^3/ha)	25	24	23	30	8	9	22	-	22	40
Volume ('000,000 t ; m^3)	4.4	0.7	0.4	0.3	0.3	0.4	0.1	-	1.7	0.9
Fields in sample	254	33	15	16	21	36	6	3	59	23
Spring sown										
Treated area %	20.1	2.6	2.2	0.2	1.1	1.3	0.4	-	1.3	1.0
Avg manure rate (t; m^3/ha)	23	27	25	21	9	9	25	-	25	17
Volume ('000,000 t ; m^3)	5.5	0.8	0.6	0.1	0.1	0.1	0.1	-	0.4	0.2
Fields in sample	311	44	29	5	16	24	10	2	20	5
Grass										
Treated area %	26.0	23.6	-	0.3	0.1	0.3	0.8	0.4	0.7	-
Avg manure rate (t; m^3/ha)	18	32	-	21	10	7	7	40	13	-
Volume ('000,000 t ; m^3)	23.1	37.3	-	0.3	0.1	0.1	0.3	0.7	0.5	-
Fields in sample	745	495	4	13	10	11	29	14	19	3

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

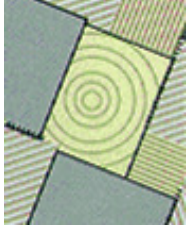


The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure within the farm on which it is produced. Conversely, non-farm manures such as biosolids appear to be favoured on winter sown tillage land.

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

Table D2.4 Percentage of fields receiving each organic manure type by sowing season and timing, Great Britain 2009

	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	21	29	25	18	42	51	12	-	21	18
September	55	13	64	47	30	33	88	-	47	44
October	17	23	11	24	8	12	0	-	27	38
Winter (Nov, Dec, Jan)	1	15	0	3	0	0	0	-	0	0
Spring (Feb, Mar, Apr)	4	19	0	8	2	2	0	-	5	0
Summer (May, Jun, Jul)	1	0	0	0	18	1	0	-	0	0
Spring sown										
August	1	0	0	0	0	15	0	-	0	0
September	2	0	6	0	0	0	0	-	17	0
October	4	0	23	0	0	0	0	-	15	15
Winter (Nov, Dec, Jan)	23	33	12	42	18	6	63	-	24	34
Spring (Feb, Mar, Apr)	64	64	60	58	82	78	37	-	43	51
Summer (May, Jun, Jul)	4	3	0	0	0	0	0	-	0	0
Grass										
August	6	6	-	0	0	0	2	0	0	-
September	4	2	-	0	0	0	8	0	9	-
October	10	3	-	6	0	0	21	0	4	-
Winter (Nov, Dec, Jan)	19	16	-	0	0	0	29	40	10	-
Spring (Feb, Mar, Apr)	45	48	-	84	81	66	35	29	35	-
Summer (May, Jun, Jul)	15	25	-	10	19	34	4	31	42	-



D3 FERTILISER VALUE OF ORGANIC MANURES

Organic manures are valuable sources of the major plant nutrients (nitrogen, phosphorus and potassium) and, where used, applications of manufactured fertiliser can usually be reduced[12]. 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.

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

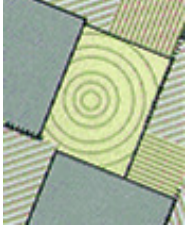


Table D3.1a Dressing cover and application rates of manufactured fertiliser to tillage crops in Great Britain, with and without applications of organic manure, 2009

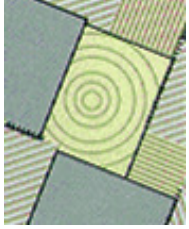
	nitrogen		*phosphate*		*potash*		*fields in sample*	
dressing cover (%)	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	100	100	17	34	29	33	245	1415
Spring barley	100	99	73	59	75	67	271	558
Winter barley	98	100	43	43	45	49	96	491
Potatoes (maincrop)	100	96	87	96	88	97	44	71
Sugar beet	97	100	25	51	62	72	46	81
Spring oilseed rape	100	100	30	24	30	23	4	35
Winter oilseed rape	100	100	10	43	17	39	67	455
Peas - animal consumption	0	4	25	67	100	91	2	25
Beans - animal consumption	36	9	64	79	64	79	3	54
Forage maize	88	96	68	44	54	63	140	30

	nitrogen		*phosphate*		*potash*		*fields in sample*	
average field rate	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	180	192	55	54	74	71	245	1415
Spring barley	90	108	46	48	53	64	271	558
Winter barley	141	142	48	54	64	73	96	491
Potatoes (maincrop)	155	192	124	172	199	299	44	71
Sugar beet	91	101	50	46	102	112	46	81
Spring oilseed rape	94	123	60	41	135	52	4	35
Winter oilseed rape	176	192	48	54	68	67	67	455
Peas - animal consumption	0	24	24	60	47	73	2	25
Beans - animal consumption	43	100	51	54	65	66	3	54
Forage maize	57	85	57	45	81	88	140	30

	nitrogen		*phosphate*		*potash*		*fields in sample*	
overall application rate	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	180	192	9	18	21	23	245	1415
Spring barley	89	107	34	29	39	43	271	558
Winter barley	138	142	20	23	29	35	96	491
Potatoes (maincrop)	155	185	108	164	176	291	44	71
Sugar beet	88	101	13	24	64	80	46	81
Spring oilseed rape	94	123	18	10	41	12	4	35
Winter oilseed rape	176	191	5	23	12	26	67	455
Peas - animal consumption	0	1	6	40	47	67	2	25
Beans - animal consumption	16	10	33	43	41	52	3	54
Forage maize	50	81	39	20	44	55	140	30

* Note: small number of fields receiving manures

For all the major tillage crops, except peas and beans, where we have very few fields, the overall rate of nitrogen from manufactured mineral fertiliser is consistently higher on fields where organic manures were not applied. Application rate increases of nitrogen ranged from 3% for winter barley through to 31% for spring oilseed rape, although again the number of fields is low for this crop. This is also predominantly the case for phosphate and potash fertiliser application rates. This was most dramatically illustrated by a 78% decrease in the rate of phosphate on manured winter oilseed rape fields. This decrease was mainly caused by a reduction in dressing cover with only 10% of manured winter oilseed rape fields receiving a dressing of



phosphate fertiliser. Spring barley is an exception to this trend with manured fields having a higher overall application rate of phosphate than unmanured ones. This overall rate was caused by a higher proportion of manured fields receiving a dressing of phosphate fertiliser. The survey does not collect reasons why manufactured fertiliser application rates may vary when used with or without organic manures. It is possible that certain fields are being managed to achieve a desired nutrient status and a strategy of this sort may require unusually high or low applications of specific nutrients. Where only a small number of fields are surveyed, such a strategy may exert an influential bias on the overall figures for a crop.

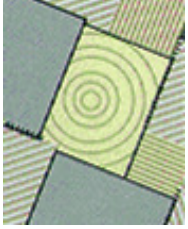
Table D3.1b Overall field rate from manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2005 - 2009

	2005		*2006*		*2007*		*2008*		*2009*	
nitrogen	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	177	199	167	197	168	194	161	183	180	192
Spring barley	87	112	102	101	94	103	88	101	89	107
Winter barley	120	150	114	141	108	141	122	137	138	142
Potatoes (maincrop)	148	186	136	152	109	144	154	156	155	185
Sugar beet	88	101	83	109	79	99	80	89	88	101
Winter oilseed rape	180	209	181	193	181	191	159	197	176	191
Forage maize	58	89	52	58	51	61	44	48	50	81

	2005		*2006*		*2007*		*2008*		*2009*	
phosphate	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	31	38	19	37	21	33	17	30	9	18
Spring barley	38	42	49	33	41	36	39	33	34	29
Winter barley	42	43	35	38	34	36	25	37	20	23
Potatoes (maincrop)	116	188	90	156	91	151	140	127	108	164
Sugar beet	23	46	19	45	11	50	15	39	13	24
Winter oilseed rape	27	44	25	35	19	32	14	31	5	23
Forage maize	42	64	43	20	40	28	34	31	39	20

	2005		*2006*		*2007*		*2008*		*2009*	
potash	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	44	44	37	42	36	40	31	37	21	23
Spring barley	48	55	60	61	51	49	48	48	39	43
Winter barley	54	58	51	54	46	62	41	53	29	35
Potatoes (maincrop)	204	306	174	225	141	230	260	227	176	291
Sugar beet	77	135	76	128	81	110	84	93	64	80
Winter oilseed rape	31	44	37	37	39	37	25	36	12	26
Forage maize	62	128	38	84	33	25	29	67	44	55

Differences in field rates with and without manures for nitrogen, phosphate and potash for the period 2005 to 2009 are shown in table D3.1b above. The trend for higher nitrogen rates on unmanured fields holds true for nitrogen for all major tillage crops throughout the period. The increased rates are most consistent for nitrogen on winter wheat at between 7% and 18% increase over manured fields. Overall rates for phosphate and potash in winter wheat show a similar trend over the five year period. Other crops show greater variability between manured and unmanured field rates for the different nutrients which may in part be due to the lower number of fields of each of these crops in the survey causing higher statistical variability.



Data for grassland are presented separately because grass is managed differently according to the amount of production required. Thus, intensive milk production requires large volumes of grass and is likely to receive higher inputs of both manure and mineral fertilisers than beef or sheep systems. Table D3.2 shows the average field rate of fertiliser applied to grassland in different management systems (as defined by Robust farm type groups) with and without applications of manure. Average field rates have been used for grassland because grass fields often receive no mineral fertiliser, not because of manure use, but because the amount of grass production required does not warrant fertiliser input.

Table D3.2 Average fertiliser application rate on grassland with and without applications of organic manure by robust type group, Great Britain 2009

	nitrogen		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Cereals								
Grass under 5 years old *	95	104	30	35	42	52	14	101
Grass 5 years and over *	78	76	23	30	25	34	13	170
All grass	86	85	29	32	39	41	27	271
Dairy								
Grass under 5 years old	156	141	33	30	50	43	144	51
Grass 5 years and over	146	112	26	21	41	24	265	159
All grass	149	116	28	23	43	28	409	210
General cropping								
Grass under 5 years old *	89	92	22	42	27	54	17	56
Grass 5 years and over *	93	94	25	28	25	28	13	81
All grass	92	93	24	37	25	45	30	137
Mixed								
Grass under 5 years old	123	109	17	28	49	41	41	121
Grass 5 years and over	73	72	13	21	27	24	41	120
All grass	95	86	15	25	38	32	82	241
Other livestock								
Grass under 5 years old	106	91	28	26	36	34	110	131
Grass 5 years and over	79	62	20	17	25	19	339	282
All grass	83	67	21	19	27	22	449	413
All farm types								
Grass under 5 years old	133	104	29	30	44	41	327	460
Grass 5 years and over	109	77	22	19	31	22	674	816
All grass	114	83	24	22	34	27	1001	1276

Note: all farm types exceeds the sum of the other in the table as it includes pig and poultry farms
* Note: small number of fields receiving manures

When looking at all farm types taken together, the rates of nitrogen, phosphate and potash fertiliser were higher on fields where manures were also used. Mineral fertiliser rates were also consistently higher on short term grass than permanent grassland.

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

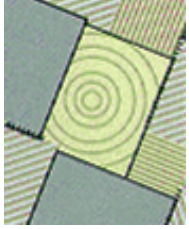


Table D3.3a Average fertiliser application rate on dairy grassland with and without applications of organic manure, Great Britain 2009

	nitrogen		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
All cut for hay	129	77	22	17	41	19	29	15
All cut for silage	154	127	29	32	48	44	280	66
All grazings	146	115	28	22	42	27	375	194

Application rates of mineral fertilisers are consistently higher for grass to be cut for silage and on fields that also receive a dressing of manure.

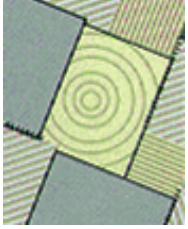
Table D3.3b Average fertiliser application rate on dairy grassland with and without applications of organic manure, Great Britain 2005 – 2009

all cut for hay	*nitrogen*		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2005	89	120	24	54	37	45	33	15
2006	86	84	30	21	41	24	37	13
2007	92	101	27	20	43	45	32	15
2008	107	97	23	21	22	25	29	12
2009	129	77	22	17	41	19	29	15

all cut for silage	*nitrogen*		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2005	165	148	33	30	57	51	224	75
2006	139	118	30	26	50	38	233	54
2007	162	151	31	28	53	57	253	64
2008	149	142	28	29	49	48	229	52
2009	154	127	29	32	48	44	280	66

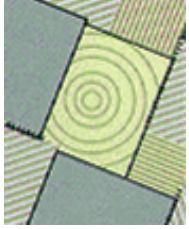
all grazings	*nitrogen*		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2005	153	157	30	29	47	38	329	175
2006	136	129	28	25	43	27	351	143
2007	148	128	26	25	41	34	364	159
2008	137	135	26	26	41	35	315	147
2009	146	115	28	22	42	27	375	194

Mineral fertiliser application rates of nitrogen, phosphate and potash on grass cut for hay have in general declined over the 5 year period 2005-2009. The exception to this trend is the increased rates of nitrogen and potash where manure was also applied. It should be noted that the number of fields in the sample managed in this way are low. There is a similar pattern of reducing nitrogen and potash on grass cut for silage since 2005. Phosphate rates on grass for silage have held more steady since 2005 in the range of 26-33 kg/ha.



In recent years there has been a great deal of promotional activity aimed at encouraging farmers to make adjustments to fertiliser inputs where manures are used. When making comparisons of the data presented in this report a number of factors should be taken into account:

- the extent to which individual farmers have accounted for the nutrients in the manures cannot be judged from these data,
- the data presented for 'with/without' manure are not a paired comparison of otherwise identical fields,
- fields which have not received manures may be on farms which have no manure and are thus managed in a different way,
- in grassland systems, fields which have not received manures may be managed differently (e.g. grazed only) compared with manured fields which may be cut more than once as well as grazed,
- for tillage crops, the overall fertiliser rate means that some fields are included which have received no fertiliser. For the 'with manure' data, it may indicate that the manure was judged to supply all the fertiliser which was required,
- for grassland, the average fertiliser rate has been used so as to avoid distorting the data by inclusion of 'unmanaged' grass, which receives no fertiliser, although this has the effect of excluding any fields on which no fertiliser was applied because the manure was considered sufficient, thus obscuring a substitution effect,
- the dataset of fields where manures are used includes fields which may have received only a very small amount of manure (see section D2). On those fields receiving large dressings, there may be a greater adjustment in mineral fertiliser,
- where reductions in phosphate and potash fertiliser have not been made, this may indicate a desire to build up soil reserves of these nutrients.



D4 SPREADING PRECISION AND RECORD KEEPING

Farmers were asked a series of questions about the care taken in application of fertilisers and manures and in record keeping. The results are presented in this section.

In 2009, 36% of farmers indicated they check the accuracy of mineral fertiliser spreaders by using catch trays on an annual basis (Table D4.1). Farmers checking more frequently than this total 15%, with 5% checking at each change of fertiliser. Thirty percent of farmers never check their spreaders for accuracy.

Table D4.1 Frequency of spread pattern checks using a catch tray, Great Britain 2005-2009

	No spreader	*Factory set & doesn't need checking*	*At each change of fertiliser type*	*Less than once a year*	*Once a year*	*Never checked*	*Contract applied*	*Other*
2005	3	11	3	12	39	26	4	3
2006	3	10	5	11	38	21	5	7
2007	4	9	7	13	36	22	5	4
2008	8	8	7	11	37	23	4	2
2009	6	7	5	10	36	23	10	2

Practices of checking are generally consistent over the five year period 2005-2009. The exception to this is an increase in contract applications which have risen from 4% of farms in 2005 to 10% of farms in 2009.

Table D4.2a Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2008/09 crop year, Great Britain 2009

	manufactured fertilisers		*organic manures*	
	farms	*farms %*	*farms*	*farms %*
No answer	73	0.1	13167	21.7
Computer program	14622	19.0	5374	8.8
Farm diary	32859	42.7	22755	37.4
Farm notebook/pocketbook	21025	27.4	11275	18.5
File record sheet (file in the office)	14955	19.5	7861	12.9
Other paper record	2179	2.8	1579	2.6
No records kept	3778	4.9	4436	7.3

Note: more than one method may be used

Farm diaries continue to be the most common method for recording both fertiliser and manure use (Table D4.2a). Computers were used for recording fertiliser applications on 19% of farms, whereas no records were kept on 5% of farms. Record keeping of each type is lower for organic manures than for manufactured fertilisers.

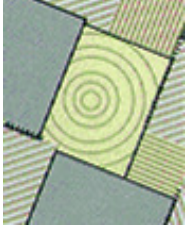
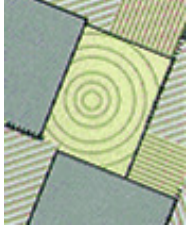


Table D4.2b Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied in the crop year, Great Britain 2005-2009

		Computer program	*Farm diary*	*Farm notebook/pocket-book*	*File record sheet (file in the office)*	*Other paper record*	*No records kept*
manufactured fertilisers	2005	16.3	40.5	25.3	19.9	3.7	10.0
	2006	19.6	38.9	25.0	22.3	4.3	9.7
	2007	21.1	40.0	28.9	21.0	3.5	5.9
	2008	17.6	41.2	28.7	28.0	0.4	5.2
	2009	19.0	42.7	27.4	19.5	2.8	4.9
organic manures	2005	6.9	27.5	15.0	12.7	1.4	12.3
	2006	9.4	29.4	14.8	13.4	3.1	9.0
	2007	12.0	29.3	18.3	12.7	2.2	10.4
	2008	8.0	32.7	18.8	16.8	0.3	9.6
	2009	8.8	37.4	18.5	12.9	2.6	7.3

Recording methods for manufactured fertilisers are show minor variations across the five year period 2005-2009. For organic manures, record keeping of some type has increased to 93% of farms in 2009, with most of this increase accounted for by use of a farm diary.



APPENDIX 1 - SURVEY STATISTICS

APP 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2009

Great Britain

	standard errors for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	2.2	2.5	1.4	1.1	1.5	2.0	2.1	6.1	1.7	2.1	1681
oilseed rape	2.7	2.9	1.2	1.6	1.9	2.6	2.6	4.8	2.2	2.5	564
winter barley	2.3	2.7	1.7	1.4	2.0	2.2	2.2	6.3	1.7	2.3	592
spring barley	1.7	2.3	1.6	1.1	1.5	1.5	1.9	1.9	1.3	1.6	851
m/c potatoes	9.0	8.2	8.6	9.3	13.6	8.0	11.1	7.9	8.8	12.2	123
sugar beet	4.2	4.5	2.0	3.4	6.9	3.8	3.9	10.0	5.0	6.9	131
all tillage crops	1.9	2.3	1.0	0.9	1.2	1.8	1.9	2.0	1.4	2.0	5105
all grass	1.8	1.6	1.1	0.4	0.6	1.9	2.4	1.7	0.8	1.4	3368

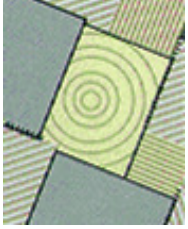
England & Wales

	standard errors for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	2.3	2.6	1.4	1.0	1.5	2.1	2.2	7.4	1.8	2.3	1578
oilseed rape	2.8	3.0	1.3	1.6	1.9	2.7	2.7	5.7	2.4	2.7	535
winter barley	2.5	2.9	1.8	1.4	2.1	2.4	2.4	8.2	2.1	2.7	527
spring barley	2.1	2.8	1.8	1.2	1.7	1.9	2.1	3.0	2.0	2.3	553
m/c potatoes	9.8	9.2	9.0	10.5	14.7	8.5	12.4	7.8	10.0	13.1	107
sugar beet	4.2	4.5	2.0	3.4	6.9	3.8	3.9	10.0	5.0	6.9	131
all tillage crops	2.1	2.5	1.0	0.9	1.3	2.0	2.0	2.8	1.8	2.5	4449
all grass	2.1	1.8	1.1	0.4	0.6	2.4	2.8	2.1	1.0	1.8	2719

Scotland

	standard errors for overall application rates (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	*total N*	*strt N*	*comp N*	*total P_2O_5*	*total K_2O*	
winter wheat	6.9	8.7	7.0	5.2	5.3	6.9	7.2	10.0	4.6	4.9	103
oilseed rape	9.0	9.8	5.6	5.9	7.2	9.0	9.8	6.7	4.8	6.1	29
winter barley	5.1	7.1	5.5	3.8	4.9	5.1	6.0	8.7	3.0	4.4	65
spring barley	2.6	3.4	2.6	1.7	2.3	2.5	3.3	2.3	1.6	2.1	298
m/c potatoes	23.0	17.8	26.0	16.9	32.7	23.0	23.2	25.7	16.9	32.7	16
all tillage crops	3.1	3.9	2.4	1.8	2.3	3.0	4.1	2.3	1.8	2.5	656
all grass	3.6	2.6	3.2	1.0	1.3	3.2	4.4	3.0	1.3	2.0	649

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 than 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.

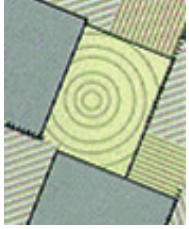
Table App 1.2 Response to main and reserve samples in 2009

	2009	*% total*
Target sample	1500	100
2008 panellists agreeing to re-contact in 2009	1255	84
Achieved 'Main' sample from 2008 panel	933	62
Achieved additional 'Main' sample	185	12
Achieved '1st reserve' sample	134	9
Achieved '2nd reserve' sample	72	5
Achieved '3rd reserve' sample	53	4
Total achieved	**1377**	**92**
Total number of refusals/non-contact	1216	
Total number of farms approached	***2593***	

Table App 1.3 Response to main and reserve samples for 2005 - 2009

Net response rate	*2005 %*	*2006 %*	*2007 %*	*2008 %*	*2009 %*
Overall achieved rate	89	88	89	88	92
Achieved % of total contact attempts	59	46	51	48	53
Main sample	85	85	72	84	81
Reserve sample(s)	15	15	28	16	19
Main reason for refusal	*2005 %*	*2006 %*	*2007 %*	*2008 %*	*2009 %*
Too busy	35	30	15	18	18
Not interested	13	10	10	9	14
Do not do surveys	6	8	4	3	3
Want payment	2	2	1	0	0
Too much paperwork	3	2	1	0	1
Other [a]	41	48	59	69	63

[a] includes non-contact and late submission



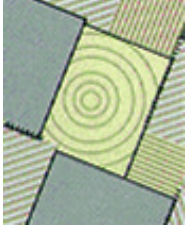
APPENDIX 2

APP 2.1 ENGLISH COUNTIES WITHIN BSFP AND DEFRA REGIONS

List of English counties indicating the BSFP and Government Office Regions[13] 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

[13] http://www.statistics.gov.uk/geography/gor.asp



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. [14]

Robust types	Main types	Constituent EC types [a]
1 Cereals	1 Cereals	[1312]
2 General Cropping	2 General Cropping	[1412], 142, 143, [1443], 602, 603, 604, [6052]
3 Horticulture	3 Specialist fruit	3211
	4 Specialist glass	2012, 2022, 2032
	5 Specialist Hardy Nursery Stock	[3401]
	6 Other horticulture	2011, 2013, 2021, 2023, 2031,2033, 2034, 311, 312, 313, 314, [3402], 601, 6061, 6062
4 Specialist Pigs	7 Specialist pigs	5011, 5012, 5013
5 Specialist Poultry	8 Specialist poultry	5021, 5022, 5023
6 Dairy	9 Dairy (LFA)	411, 412 (LFA)
	10 Dairy (lowland)	411, 412 (non-LFA)
7 LFA Grazing Livestock	11 Specialist sheep (SDA)	441 (SDA)
	12 Specialist beef (SDA)	421,422 (SDA)
	13 Mixed Grazing Livestock(SDA)	431, 432, 442, 443, [4443], [4444] (SDA)
	14 Various Grazing Livestock (DA)	421, 422, 431, 432, 441, 442, 443, [4443], [4444] (DA)
8 Lowland Grazing Livestock [b]	15 Various Grazing Livestock (lowland)	421, 422, 431, 432, 441, 442, 443, [4443], [4444] (non-LFA)
9 Mixed	16 Cropping and dairy	811, 812
	17 Cropping, cattle and sheep	[8132], [8142]
	18 Cropping, pigs and poultry	821
	19 Cropping and mixed livestock	822, 8232
	20 Mixed livestock	5031, 5032, 711, [7122], 721, 722, 723
10 Other [c]	21 Specialist set-aside	[1311]
	22 Specialist grass and forage	[1411], [1444], [4442], [6051], [7121], [8131], [8141]
	23 Specialist horses	[4441]
	24 Non-classifiable holdings: fallow	[91]
	25 Non-classifiable holdings: other	[92]

[a] 2004 EC Typology described in Commission Decision 85/377/EEC as amended by Commission Decisions 94/376/EC, 96/393/EC and 99/725/EC with minor modifications to adapt it to United Kingdom conditions. For a full list of EC types see here. These minor modifications are indicated by the EC farm type number being shown in square brackets. Definitions for these modified EC farm types are available from the Defra contact shown at the front of this publication. EC types 132, 133, 1441, 1442, 3212, 3213, 322, 323, 330, and 8231 have not been allocated in the classification, since these types of production do not occur in the United Kingdom at a significant level.

[b] Definitions of LFA (Less Favoured Area), lowland, SDA (Severely Disadvantaged Area), and DA (Disadvantaged Area) farms are available on request from the Defra contact shown at the front of this publication.

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

[14] http://statistics.defra.gov.uk/esg/pdf/farmclass.pdf