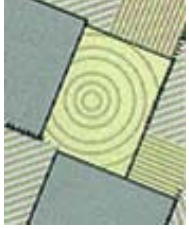
THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS
FOR CROP YEAR 2008



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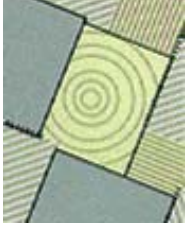

FOREWORD

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

The 2008 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 2008, 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 2009

ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2008 British Survey of Fertiliser Practice.

The authors of the report 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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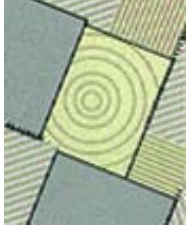
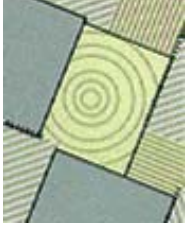
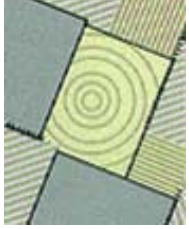
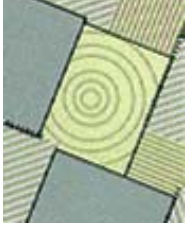


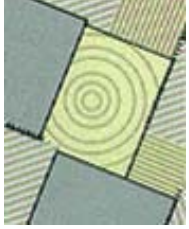
CONTENTS





LIST OF TABLES AND FIGURES





EXECUTIVE SUMMARY

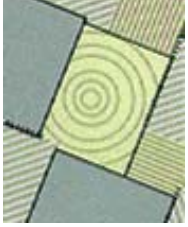
The British Survey of Fertiliser Practice is an annual, nationally representative survey based on the selection of a random stratified sample of farms from mainland Britain. In 2008, responses from 1,327 farms were obtained. The main purpose of the survey is to estimate average application rates of nitrogen, phosphate and potash used for agricultural crops and grassland. Information is also collected on applications of sulphur fertilisers, organic manures and lime.

Fertiliser prices rose considerably from autumn 2007 (more than doubling by early 2008). This is likely to have had some impact on the decisions of farmers in terms of cropping and fertiliser application rates. The extent of these are unclear at this time, but the large increases in prices will have come after many farmers had made fertiliser purchases and decisions for the 2007/08 cropping year.

The main findings from the 2008 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 2007/2008 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 2008

	All Tillage	All Grass	All Crops and Grass
Total Nitrogen			
Overall application rate, 2008 (kg/ha)	140	55	95
Mean overall application rate, 2004-2008 (kg/ha)	147	69	105
Crop area receiving dressing, 2008 (%)	91	58	73
Straight Nitrogen			
Overall application rate, 2008 (kg/ha)	125	23	71
Mean overall application rate, 2004-2008 (kg/ha)	130	26	74
Crop area receiving dressing, 2008 (%)	80	25	51
Compound Nitrogen			
Overall application rate, 2008 (kg/ha)	16	32	24
Mean overall application rate, 2004-2008 (kg/ha)	18	42	31
Crop area receiving dressing, 2008 (%)	24	42	33
Total Phosphate			
Overall application rate, 2008 (kg/ha)	31	10	20
Mean overall application rate, 2004-2008 (kg/ha)	36	15	25
Crop area receiving dressing, 2008 (%)	52	42	47
Total Potash			
Overall application rate, 2008 (kg/ha)	43	13	27
Mean overall application rate, 2004-2008 (kg/ha)	49	19	33
Crop area receiving dressing, 2008 (%)	55	42	48
Total Sulphur			
Overall application rate, 2008 (kg/ha)	23	2	12
Mean overall application rate, 2004-2008 (kg/ha)	21	2	11
Crop area receiving dressing, 2008 (%)	40	5	21



Nitrogen

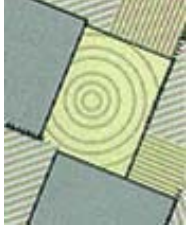
- The decline in total nitrogen application rates on all crops and grassland of 10 kg/ha between 2007 and 2008 is more than seen in previous years. Reductions of nitrogen applied were observed on both tillage crops and grass, although the reduction was slightly less in tillage crops. Whilst this continues the long term trend in declining nitrogen application rates observed on grassland, the extent of the reduction on tillage crops is surprising (even after accounting for the recent large increases in fertiliser prices) - the rate on all tillage has remained relatively constant for the last 25 years.
- There were falls in the overall application rate of nitrogen on all the major tillage crops (except potatoes and oilseed rape where the rates had increased since 2007). Straight nitrogen overall application rates followed the same trend with decreased application rates in all crops except potatoes and oilseed rape. The proportion of crop area (for tillage crops) receiving a straight nitrogen application reduced by 2% since 2007. Overall rates of compound nitrogen applied in 2008 increased by 1-4 kg/ha over 2007 in major tillage crops, the exception being sugar beet where the rate declined by 1kg/ha. However increases in compound nitrogen rates do not compensate for the reduction in straight nitrogen applied.
- Overall rates of total nitrogen on grassland fell considerably from 65 kg/ha in 2007 to 55 kg/ha in 2008. This was due both to reductions in the average application rates of nitrogen fertilisers as well as a decline in the dressing cover of nitrogen on grassland. This represents the lowest total overall nitrogen rate reported for the whole survey period since 1983.

Phosphate

- Overall phosphate use on tillage crops and grassland in 2008 fell compared to last year (by 3 kg/ha to 31 kg/ha and by 4 kg/ha to 10 kg/ha respectively), making the 2008 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 2008, just 52% of all tillage crops and 42% of grassland received a phosphate application, bringing the five-year means down to 58% and 53%, 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 36 kg/ha for the period 2004-08. 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 15kg/ha for the period 2004-08.

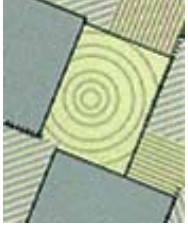
Potash

- The proportion of the area of tillage crops receiving a potash dressing decreased by 3% to 55% in 2008. This combined with reduced average rates of potash in 2008 (79 kg/ha) meant the overall rate decreased by 4 kg/ha compared to last year. The overall rate on grassland fell by 5 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 49 kg/ha in 2004-08. 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 2008. 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. 2008 saw a slight reduction in dressing covers for cereals at 35%-43%, whilst 70% for oilseed rape was unchanged from 2007.
- In 2008, 21% of all crops and grass received a dressing of sulphur, this figure was 40% for tillage crops. On tillage crops the overall application rate for sulphur was 23 kg/ha a drop of 2 kg in comparison to last year. Applications on grass were consistent with 2007 at 2 kg/ha.



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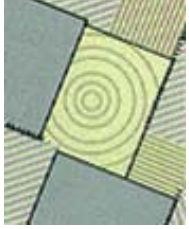
[2] Yates, F. and Boyd, D.A. (1965). Two decades of Surveys of Fertiliser Practice. *Outlook on Agriculture* **5**, 203-210.

[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 2007 (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 1327 holdings in 2008.

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 2008, 60% of the sample had also responded in 2007.

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.

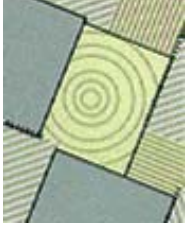


Table A2.1 Derivation of the stratified random sample for the 2008 survey, England & Wales

	farm holdings in population in 2007	total crops and grass in 2007 (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	17905	7.4	0.51	91	91	0.51
51-100 ha	15409	13.6	1.08	167	151	0.98
101-200 ha	9661	16.2	2.06	199	186	1.93
200+ ha	3235	12.8	4.82	156	134	4.14
Total livestock & mixed	46210	50.1	1.33	613	562	1.22
Crops						
(Robust types: cereals, general cropping)						
crops & grass area						
20-50 ha	6776	2.9	0.52	35	23	0.34
51-100 ha	7532	6.8	1.09	82	64	0.85
101-200 ha	7228	12.7	2.14	155	132	1.83
200+ ha	5840	27.0	5.65	330	274	4.69
Total crops	27376	49.3	2.20	602	493	1.80
Horticulture						
(Robust type: horticulture)						
crops & grass area						
20-50 ha	549	0.2	2.37	13	10	1.82
51-100 ha	171	0.1	4.68	8	7	4.09
101-200 ha	66	0.1	10.61	7	7	10.61
200+ ha	23	0.1	30.43	7	3	13.04
Total horticulture	809	0.6	4.33	35	27	3.34
Total for England & Wales	74395	100		1250	1082	1.45

[a] The *notional sampling fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2007*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2007*

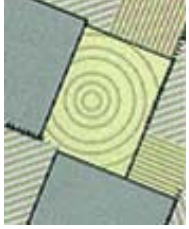


Table A2.2 Derivation of the stratified random sample for the 2008 survey, Scotland

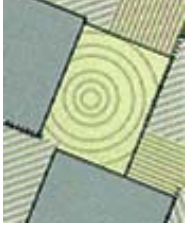
	farm holdings in population in 2007	total crops and grass in 2007 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
Scotland						
Cereal/general						
(Robust types: cereals, general cropping, horticulture)						
crops & grass area						
20-50 ha	1121	2.4	0.54	6	7	0.62
51-100 ha	1369	6.3	1.10	15	15	1.10
101-200 ha	1336	11.9	2.25	30	28	2.10
200+ ha	668	14.2	5.24	35	31	4.64
Total cereal/general	4494	34.8	1.91	86	81	1.80
Livestock & mixed						
(Robust types: specialist pigs, specialist poultry, dairy, cattle and sheep (LFA & lowland), mixed)						
crops & grass area						
20-50 ha	3094	6.6	0.52	16	16	0.52
51-100 ha	3321	15.3	1.14	38	36	1.08
101-200 ha	2542	22.2	2.16	55	57	2.24
200+ ha	1065	21.2	4.98	53	55	5.16
Total livestock & mixed	10022	65.2	1.62	162	164	1.64
Total for Scotland	14516	100		248	245	1.69

A2.2 DATA COLLECTION

Data collection was undertaken between June and September 2008. 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 2007*

[b] The *achieved sampling fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2007*



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 2007 to autumn 2008, corresponding to the 2008 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 2007. 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.

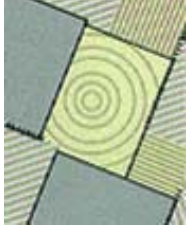
5. The abbreviation **N** is used for nitrogen; **P_2O_5** for phosphate; **K_2O** for potash, **SO_3** for sulphur and **FYM** for all types of organic manure e.g. slurries and solid manures. The phrase **total use** includes both straight (single nutrient) and compound (multi nutrient) products. Fertiliser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

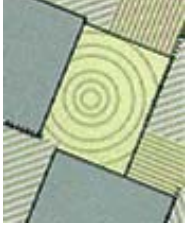
   Data presented in tables GB4.1 to GB4.5 are derived from the robust types shown below.

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 2008. 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 Agricultural Survey estimates for areas of individual major crops, crop groupings and total tillage and grassland categories in 2006/07 and 2007/08, and illustrates percentage changes in relative cropping areas over the past five years. There were about 11.1 million hectares of managed agricultural land in Britain in 2008, of which 4.7 million hectares (42%) were cultivated for tillage cropping and the remainder, 6.4 million hectares, were grassland (excluding rough grazing).

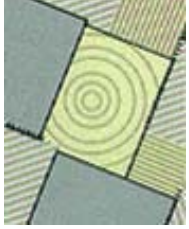
The Single Farm Payment was introduced on 1 January 2005, replacing all the previous main Common Agricultural Policy (CAP) payment schemes with a single payment. To obtain this single payment farmers must demonstrate compliance with a number of measures designed to protect the environment. Extra payments 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, 2007 – 2008

Crops	June 2007 '000s ha	June 2008 '000s ha	% change since 2007	% change since 2003	2008 crop areas as % of total tillage area
Wheat	1807	2068	14.5	13.1	44.2
Barley – winter	378	410	8.5	-9.0	8.8
– spring	497	596	20.0	-0.2	12.7
Total cereals[1]	*2836*	*3234*	*14.0*	*7.1*	*69.1*
Oilseed rape – total	601	598	-0.6	29.9	12.8
Sugar beet	125	120	-4.3	-26.2	2.6
Potatoes[2]	135	138	2.3	-0.4	3.0
Linseed	11	16	48.4	-49.4	0.3
Peas/beans[3]	161	148	-7.9	-36.9	3.2
Maize/other fodder	213	214	0.6	22.1	4.6
Vegetables	120	120	0.5	-2.5	2.6
Total tillage[4]	*4299*	*4682*	*8.9*	*5.9*	*100.0*
Set-aside and bare fallow[5]	603	194	-67.8	-72.9	
Grassland					2008 grass areas as % of total grass area
Less than 5 years old	1054	1024	-2.9	-3.6	16.0
5 years and older	5293	5363	1.3	7.8	84.0
Total grass[6]	*6347*	*6387*	*0.6*	*5.8*	*100.0*
Total crops and grass[7]	*10646*	*11069*	*4.0*	*5.8*	

[1] including minor cereals (oats, rye, triticale, mixed corn).
[2] early + maincrop potatoes.
[3] harvested dry for animal consumption or, for peas, human consumption.
[4] including other crops, but not bare fallow or set-aside.
[5] including industrial crops on set-aside. The obligatory set-aside rate for the 2008 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 2007 and 2008 cropping years, the total area of uncropped land (bare fallow and set-aside) reduced by 68% in 2008, total area under tillage crops increased by 9% and cereals increased by 14%. These changes reflect the 0% rate of obligatory set-aside introduced in September 2007.

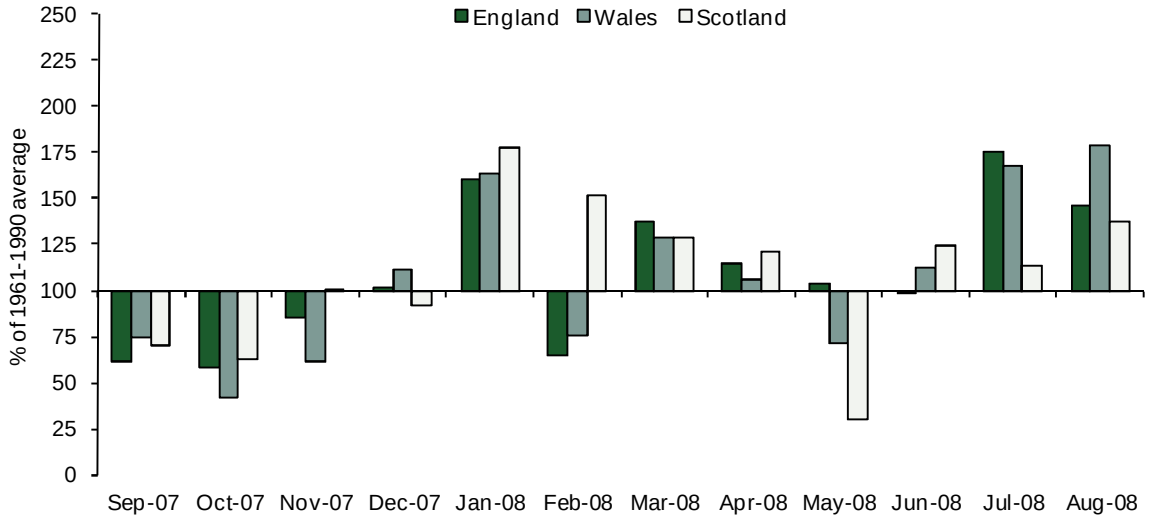
Fertiliser prices rose considerably from autumn 2007 (more than doubling by early 2008). This is likely to have had some impact on the decisions of farmers in terms of cropping and fertiliser application rates. The extent of these are unclear at this time, but the large increases in prices will have come after many farmers had made fertiliser purchases and decisions for the 2007/08 cropping year. Fertiliser prices remained high throughout 2008 and we would expect these to have a higher impact on fertiliser usage in the 2008/09 cropping year.

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.

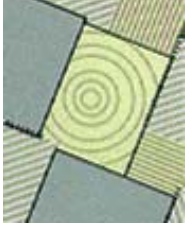
The weather in autumn 2007 was typical in terms of temperature, but with lower than average rainfall. The New Year of 2008 brought above average rainfall, with parts of northern England and southern Scotland experiencing 250% of their average rainfall for that month in January. March and April were both wet months before drying out in May, which was the warmest since 1914. July and August again were wetter than average resulting in difficult harvesting conditions for many, but with little effect on fertiliser applications with these wettest months occurring as late in the year as they did.

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 2004-2008. 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 2007-2008 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 1.8 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 2008 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. The data show continuing falls in overall application rates on all crops and grass for nitrogen, phosphate and potash. 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 2004 – 2008

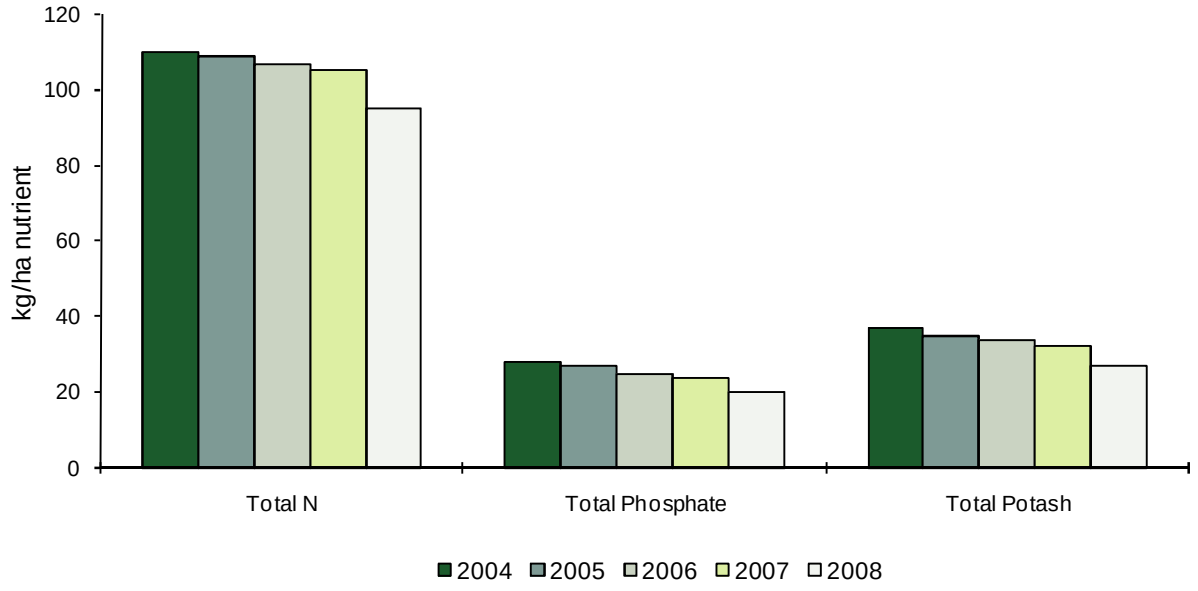


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2004 – 2008

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2004	152	77	110
2005	150	74	109
2006	147	72	107
2007	148	65	105
2008	140	55	95

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2004	132	27	73
2005	129	28	74
2006	128	28	74
2007	133	26	77
2008	125	23	71

Compound nitrogen

	tillage crops	*grass*	*all crops and grass*
2004	20	50	37
2005	20	47	35
2006	18	44	32
2007	15	39	28
2008	16	32	24

B1.1.1 Nitrogen

All crops and grassland

The total nitrogen use on all crops and grassland declined more in 2008 than seen in previous years (Figure B1.1), due to a decrease in the amount of straight nitrogen applied to tillage crops and grass and a reduction on the amount of compound nitrogen applied to grass (Table B1.1). The exception to these declining rates was a slight increase in compound nitrogen applied to tillage crops compared to 2007, but this does not compensate for the reduction in use of straight N.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2004 – 2008

Tillage crops

Straight N continues to be the main source of nitrogen on tillage crops. A decrease in the proportion of tillage area receiving a straight nitrogen dressing as well as a decrease in the average field application rate are responsible for the reduction the overall total nitrogen for these crops (125 kg/ha) compared to 2007.

Grassland

Overall total nitrogen use on grassland continued to show a decline, with a drop of 10 kg/ha from the previous year. The overall nitrogen application rate (55 kg/ha) was the lowest reported for the whole survey period since 1983 (see section B2). This may be related to the continuing decline in dairy cow numbers in Great Britain and to NVZ requirements.

B1.1.2 Phosphate and Potash

Phosphate

Table B1.2 shows overall phosphate levels for the past five years. The 2008 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 (31 kg/ha) and grass (10 kg/ha). On tillage crops this was partly due to a fall in the area receiving phosphate fertiliser from 54% in 2007 to 52% in 2008 (five year mean 58%), but also a decline in the average application rate. Likewise for grassland a reduction in the average application rate was compounded by a more substantial decline in the area receiving phosphate fertiliser from 51% in 2007 to 42% in 2008 (five year mean 53%).

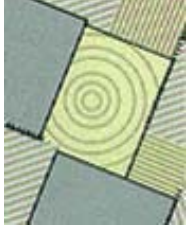


Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2004 – 2008

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2004	41	17	28
2005	40	16	27
2006	35	16	25
2007	34	14	24
2008	31	10	20

Total potash

	tillage crops	*grass*	*all crops and grass*
2004	55	22	37
2005	53	20	35
2006	49	21	34
2007	47	18	32
2008	43	13	27

Potash

As with phosphate, overall potash use in 2008 fell to the lowest ever recorded by the Survey on tillage crops (43 kg/ha) and grassland (13 kg/ha) alike. On tillage crops this fall was caused by a decrease in the tillage area receiving a dressing; 58% in 2007 to 55% in 2008 as well as a small reduction in average field application rate. On grassland there was also a reduction in the area receiving potash (51% in 2007 down to 42% in 2008), compounded by a 3 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 2008 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.

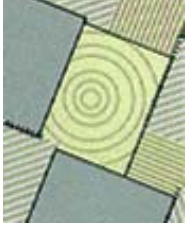


Table B1.3 Overall fertiliser use (kg/ha) on major tillage crops, Great Britain 2004 – 2008

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	197	104	144	154	202	95
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

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	186	59	125	49	189	85
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

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	11	45	19	105	13	10
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

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	39	44	46	125	39	36
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

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	48	57	62	201	46	104
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

[a] Figures for maincrop potatoes include second earlies.

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

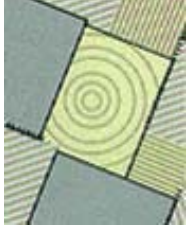


Table B1.4 Average field rates (kg/ha) on major tillage crops, Great Britain 2004 – 2008

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	199	106	145	158	203	103
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

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	195	87	140	101	195	102
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

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	63	66	66	131	52	64
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

Total phosphate

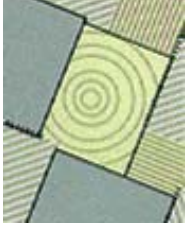
	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	63	53	61	146	62	71
2005	61	51	61	168	63	73
2006	62	54	59	141	59	72
2007	62	51	58	149	61	77
2008	61	48	56	147	61	58

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes* [a]	*oilseed rape* [b]	*sugar beet*
2004	78	65	79	231	72	130
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

[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

Overall rates of total nitrogen (Table B1.3) decreased on all the major tillage crops except maincrop potatoes and oilseed rape where the rates had increased compared to 2007. 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 2004 – 2008

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2004	224	188	111	99	134	151
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

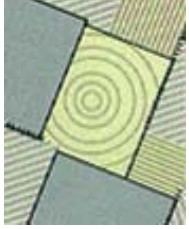
Nitrogen fertiliser requirements for winter wheat depend on the intended market end use (grain N levels), as well as upon soil type and the residual soil nitrogen fertility from previous cropping and manure practice[9]. Milling varieties are often grown as a second wheat and often receive extra nitrogen, 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 27% of the crop area in 2008 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 2004 – 2008, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2004	30	70	60	40	33	67
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

[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 declined to 94 kg/ha in 2008 which is the lowest for the five year period (mean: 100 kg/ha). The overall application rate of straight nitrogen declined to 56 kg/ha against the trend for increasing overall rates since 2005. The compound nitrogen rate increased by 2 kg/ha to 39 kg/ha. Average field rate for total nitrogen was 99 kg/ha in 2008, continuing their year-on-year 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 decreased from 2007 to 102 kg/ha. For non-malting crops the nitrogen application rate decreased from a high of 101 kg/ha in 2002 to a five-year low of 95 kg/ha in 2005. In 2006, the application rate on non-malting spring barley increased slightly to 97 kg/ha, but has fallen in subsequent years to 95 kg/ha in 2008.

Estimated nitrogen rates on spring barley crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 11 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 2004-2008 is 58%.

Winter barley

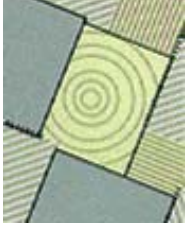
Since 2002 overall total nitrogen use on winter barley has steadily decreased from year to year, down to 136 kg/ha in 2006. This rate was maintained in 2007, but decreased again in 2008 to 134 kg/ha. Straight nitrogen rates fell by 4 kg/ha whereas compound nitrogen increased by 3 kg/ha.

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 decreased by 9 kg/ha to 120 kg/ha and by 1 kg/ha to 144 kg/ha on non-malting crops in 2008 (Table B1.5).

The higher application rates of nitrogen (five-year mean of +19 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 greater 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 highest in the last 5 years in 2007 at 37%. In 2008 this figure fell back to 27% making it the lowest percentage area grown for malting in the last 5 years. The five year mean for the percentage of the crop grown for malting for the period is 32% (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

Overall total nitrogen use on maincrop potatoes has fluctuated over the last five years. In 2008 it increased by 23 kg/ha to 154 kg/ha, well below the five year mean of 149 kg/ha (Table B1.3). This increase in 2008 is due to increases in the average field rates of straight and compound nitrogen (Table B1.4), as well as a increase in the area receiving any nitrogen fertiliser (99% in 2008 compared with 91% in 2007).

Oilseed rape

In 2008, overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, increased by 2 kg/ha to 191 kg/ha (five year mean 195 kg/ha). The increase was caused by an increase in 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 increased by 3 kg/ha between 2007 and 2008. While the rate for spring crop appears to have decreased by 12 kg/ha, it should be remembered that this crop represents only 1% of the total oilseed rape area and data for it are drawn from a much smaller number of sample points which have lower statistical integrity 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 2004 – 2008

Total nitrogen (kg/ha)

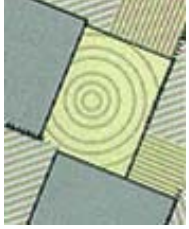
	winter oilseed rape	*spring oilseed rape**
2004	211	136
2005	206	153
2006	192	163
2007	191	127
2008	194	115

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

As in the previous year, good conditions for establishment in August and September 2007 resulted in a high level of winter cropping in 2007. The lowest area of winter crops (81%) occurred in 2003. The high level of spring cropping in 2003 and 2004 was almost certainly due to the very dry conditions in the autumns of 2002 and 2003. Winter sown crops did not establish well and were often re-drilled with a spring crop.

Sugar beet

The overall nitrogen use on sugar beet fell considerably (-6 kg/ha) in 2008 to 86 kg/ha (five year mean 93 kg/ha). This decrease occurred because the proportion of crop area receiving a nitrogen dressing fell (96% in 2007 compared with 93% in 2008) and the average rates of both straight (-1 kg/ha) and compound nitrogen (-4 kg/ha) reduced.



B1.2.2 Phosphate and Potash

Phosphate

Overall phosphate use on tillage crops reduced by 4 kg/ha in 2008. The reduction is consistent across major arable crops with only winter barley and potatoes overall rates maintained at 2007 levels (Table B1.3). The biggest reduction was in sugar beet (-10 kg/ha) which was due to a reduction in both average field rate and the proportion of the crop receiving a phosphate dressing. The overall phosphate rate of 31 kg/ha is the lowest over the last 5 years (mean 36 kg/ha for the period). Average field rates were reduced in all major arable crops apart from oilseed rape where the rate was the same as in 2007 at 61 kg/ha. Proportions of crop area receiving phosphate dressings were by in large consistent with 2007, the exception being winter wheat where this reduced by 5% to 45% of the crop area.

Potash

Overall potash use on tillage crops decreased in 2008 by 4% to 43 kg/ha associated with a reduction in the tillage area receiving a dressing (58% in 2007, down to 55% in 2008) and a reduced average field rate. The average field rate for winter wheat was the same in 2008 as it was in 2007, but the rate reduced on other major cereals, oilseed rape and sugar beet. These rates are at their lowest for the last 5 years. The average field rate for potash on potatoes was the only major tillage crop to increase, to 249 kg/ha in 2008, in comparison to 221 kg/ha for last year.

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 a slight reduction in dressing covers for cereals at 35%-43%, whilst 70% for oilseed rape was unchanged from 2007 (Table1.8).

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2004 – 2008

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2004	38	37	27	57
2005	41	34	32	59
2006	43	42	32	64
2007	46	44	36	70
2008	43	42	35	70

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2004	53	48	46	85
2005	55	52	41	82
2006	51	49	41	70
2007	51	53	43	80
2008	51	46	42	85

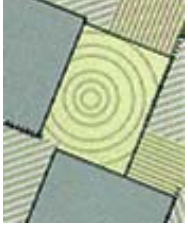


Table B1.9 shows the proportion of major tillage crops receiving a sulphur dressing in England & Wales compared with Scotland. Historically a higher proportion of cereal and oilseed crops was treated with sulphur in Scotland than in England & Wales which may have been due to the greater awareness of 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 are now 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 2008 these percentage dressing covers have fallen back for the major crops, the exception to this being spring barley.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2004 – 2008

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2004*	37	35	25	57
	2005	41	33	31	59
	2006	42	41	32	63
	2007	46	45	38	72
	2008	43	42	42	70
Scotland*	*2004*	59	57	29	60
	2005	41	37	33	61
	2006	52	60	31	83
	2007	56	39	32	53
	2008	48	42	27	66

* 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 2004 – 2008

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2004	27	51	77	17	22
2005	28	47	74	16	20
2006	28	44	72	16	21
2007	26	39	65	14	18
2008	23	32	55	10	13

The 10 kg/ha drop in overall total nitrogen use on grassland in 2008 was a result of a fall in the average rate (-4 kg/ha) and a reduction in the dressing cover (Table B1.11), which at 58% is the lowest value for the last five years (mean 66% for the period). In 2008 compound nitrogen was applied to slightly less than twice the area of grassland than was straight nitrogen, but, where it was applied, the compound nitrogen was applied at more than three-quarters of the rate of straight nitrogen.

There has been some fluctuation in the dressing cover for straight and compound nitrogen over the past five years (means of 26% and 52%, respectively), but the trend for average field rates has been essentially downwards for both types over the same period.

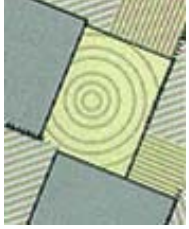


Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2004 – 2008

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2004	25	58	70	59	59
2005	26	54	68	55	55
2006	28	55	70	56	56
2007	26	49	66	51	51
2008	25	42	58	42	42

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2004	107	88	109	29	38
2005	107	87	109	29	37
2006	102	80	103	28	37
2007	103	79	99	27	35
2008	93	77	95	24	32

Average field rates for phosphate and potash were at their lowest level for the five year period in 2008, falling to 24 kg/ha for phosphate and 32 kg/ha for potash, compared with a mean for the period of 27 kg/ha and 36 kg/ha, respectively. The dressing cover for phosphate has fluctuated over the past five years, but has remained identical to potash throughout this period. 2008 was no exception, with dressing cover for both nutrients falling to 42% (five year mean: 53%).

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 2008 are presented in Section C. The Survey estimates of annual distributions of the total grassland area between grazing and cutting management regimes since 2004 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.

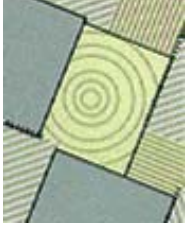
Table B1.12 Grassland utilisation (% of grass area), Great Britain 2004 – 2008

	grazed [a]	*silage* [b]	*hay* [b]
2004	94	29	11
2005	93	28	13
2006	91	31	11
2007	92	30	12
2008	95	29	12

Nearly all grassland is grazed at some stage during the season (Table B1.12) and the proportion in 2008 (95%) is close to the five year mean of 93%.

[a] May also be cut.

[b] May also be grazed.



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

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2004 – 2008

Total nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2004	75	121	61	107	137	91
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

Straight nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2004	26	40	27	107	113	92
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

Compound nitrogen

	overall application rate			average field rate		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2004	49	81	34	85	107	72
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

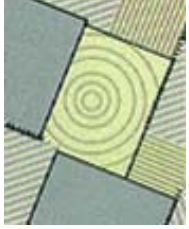
During the period 2004-2008, even though overall total nitrogen rates for the silage and hay categories have fluctuated slightly, all grass categories show a decrease. The changes in overall application rate of total nitrogen appear to be due both to a decline in the average field rate and reductions in the dressing cover receiving nitrogen.

There has been a declining trend in the overall use of straight nitrogen on all grass categories over the previous five years despite a slight increase in 2006. The rates for hay are the most variable, but the 2008 rate of 21 kg/ha is only overall application rate to increase. Compound nitrogen inputs have also shown some small fluctuation during the last five years, but the general trend is downward and have ended on a five-year low for all categories of management. The five year means for the overall compound nitrogen rate are 41, 72 and 29 kg/ha for grazed grass, silage and hay respectively, a fall of around 4-6 kg/ha on last year's five year means across all grass types. Average field rates for hay for straight and compound nitrogen fertilisers are the same as those seen in 2007.

The fall in nitrogen use on grassland throughout the 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 2004 – 2008

Total phosphate

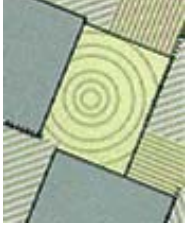
	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2004	17	26	14	29	36	29
2005	16	25	14	28	35	28
2006	15	24	15	27	35	30
2007	13	21	11	26	31	30
2008	9	18	7	23	30	22

Total potash

	overall application rate			*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]	*grazed* [a]	*silage* [b]	*hay* [b]
2004	21	42	18	36	53	36
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

Overall phosphate rates declined over the period 2004-2008 (Table B1.14). In 2008, the rates across all grass types were the lowest for the period. The corresponding five-year means for grazed grass, silage and hay were 14, 23 and 12 kg/ha, respectively. Average field rates showed a similar pattern.

Like phosphate, overall potash rates have declined between 2004 and 2008 to reach a five year low across all types of grassland. Five year means were 18, 36 and 15 kg/ha for grazed grass, silage and hay, respectively. Average field rates show a similar trend.



B1.3.3 Sulphur

In 2008, only 5% of the total grassland area received a sulphur dressing (mean 6% for 2004-2008 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, and after a gentle increase in recent years on grazed grass and grass cut for silage, both have fallen in 2008 to their lowest in the period.

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 2004 – 2008

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2004	5	10	5	6
2005	5	11	6	6
2006	7	14	4	7
2007	5	10	4	5
2008	4	9	4	5

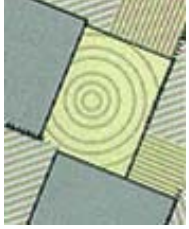
Average application rate per year (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2004	36	37	29	38
2005	34	39	47	37
2006	38	35	23	38
2007	45	47	28	43
2008	33	34	44	33

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. These rates have fallen back in 2008, with the exception of hay where the average field rate was 44 kg/ha. The five year means are 37, 38 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 1970 - 2008 and Scotland and Great Britain 1983 – 2008

	tillage crops			*grass*			*all crops and grass*		
	England & Wales	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*	*England & Wales*	*Scotland*	*Great Britain*
1970	88	-	-	74	-	-	-	-	-
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

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 rate for 2008 is below that range, with the overall rate of nitrogen on tillage crops for Great Britain being 140 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, which may be in part as a consequence of declining dairy populations.

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 – 2008

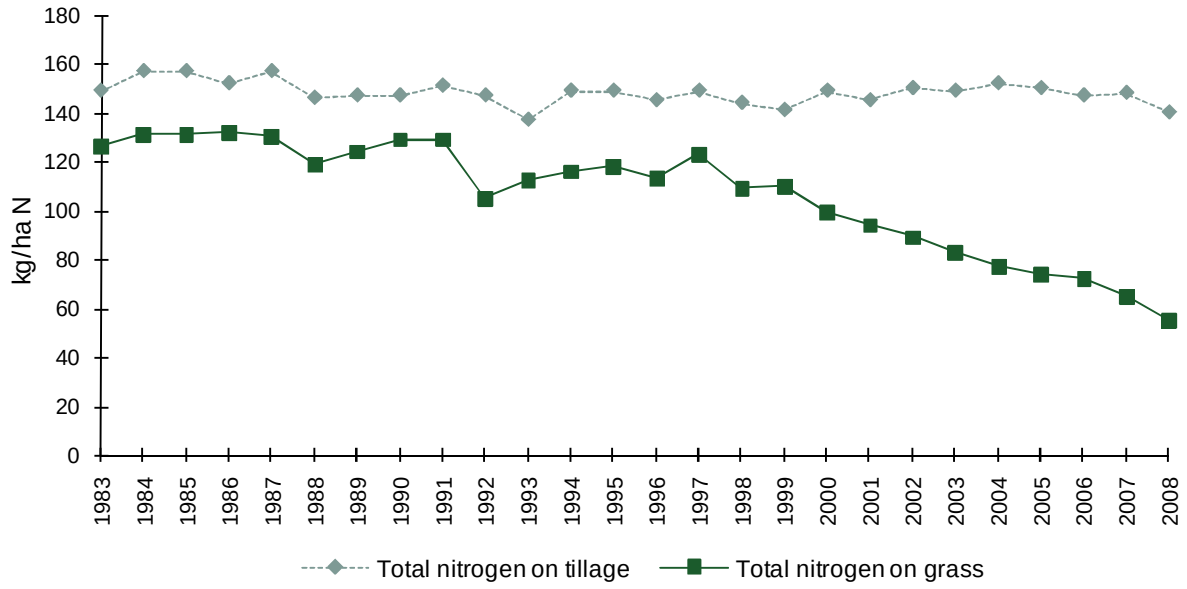
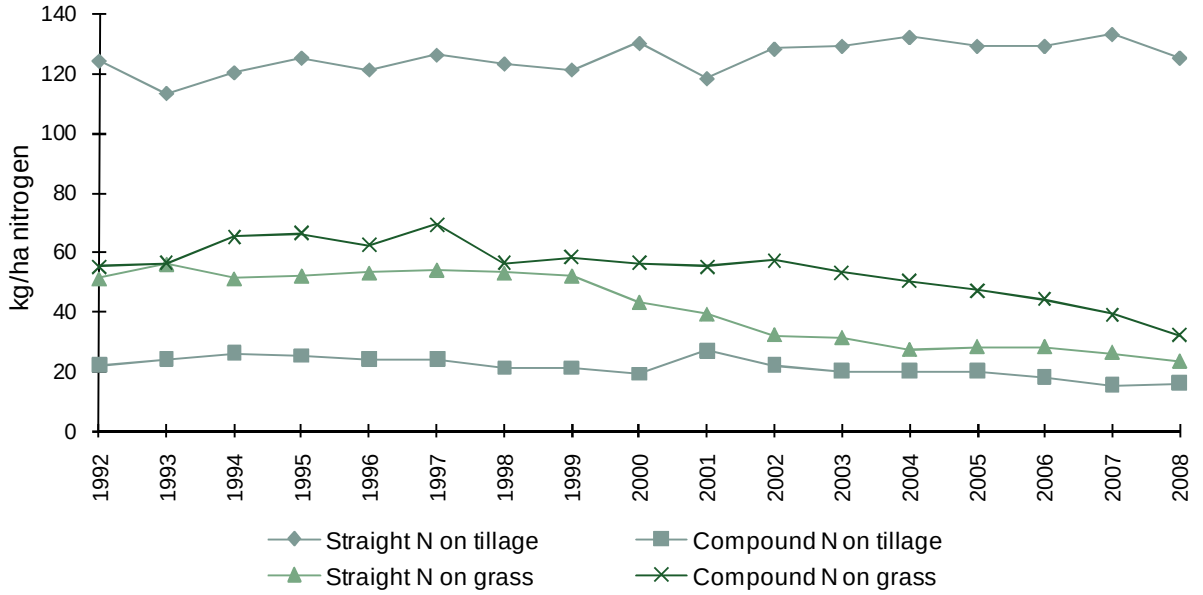


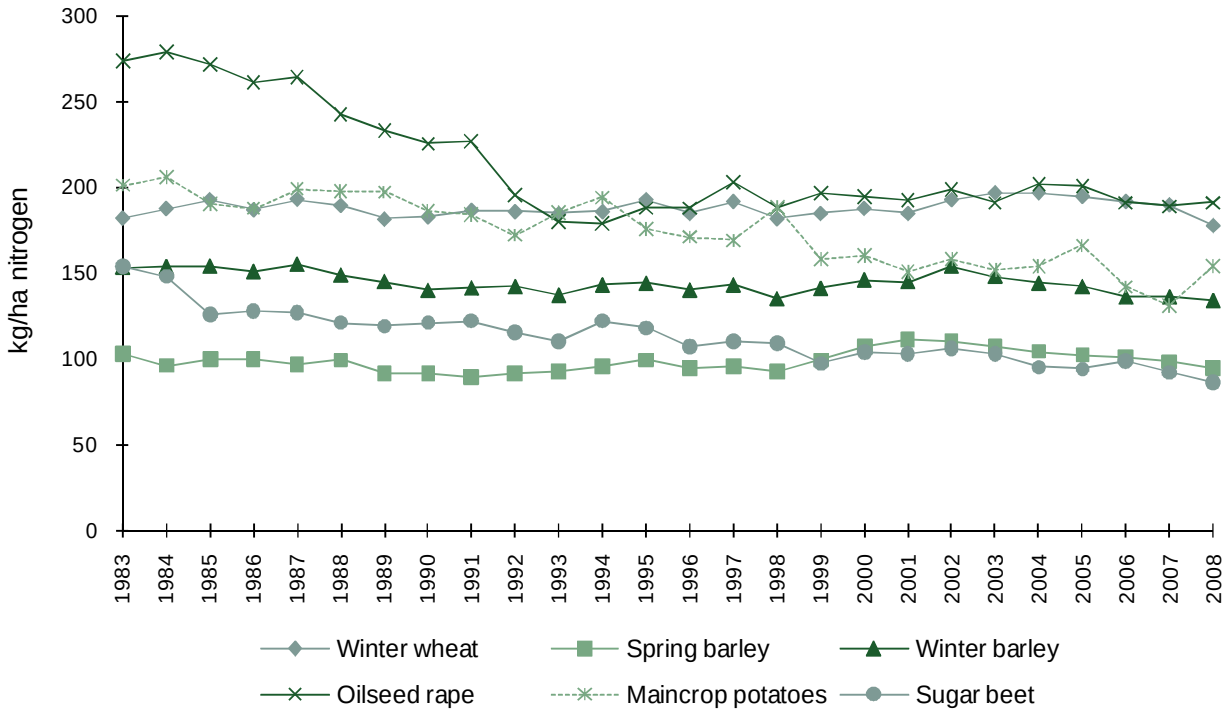
Figure B2.2 Overall application rates (kg/ha) of straight and compound nitrogen on tillage crops and grassland, Great Britain 1992 – 2008

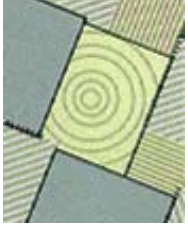


B2.1.1 Nitrogen use on major tillage crops

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 – 2008





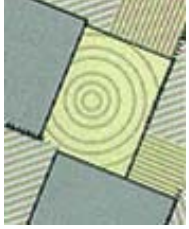
B2.1.2 Autumn and winter applications of nitrogen fertiliser

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 still 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 – 2008

	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



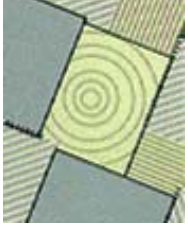
B2.2 PHOSPHATE AND POTASH USE

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 - 2008 and Scotland and Great Britain 1983 – 2008

	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

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 2008 rate of 31 kg/ha is the lowest rate recorded since Great Britain records began.

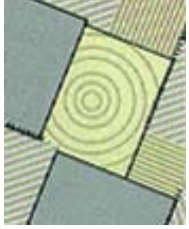


The overall rate of phosphate on grassland was highest in 1983, at 28 kg/ha, and then application remained relatively stable at 23-25 kg/ha between 1985 and 1997, apart from a temporary recorded drop to 21 kg/ha in 1992-93. However, overall phosphate use has decreased gradually since 1997 to a level of 10 kg/ha in 2008, 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 15 kg/ha for the period 2004-08.

Table B2.4 Overall potash application rates (kg/ha), England & Wales 1969 - 2008 and Scotland and Great Britain 1983 – 2008

	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

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

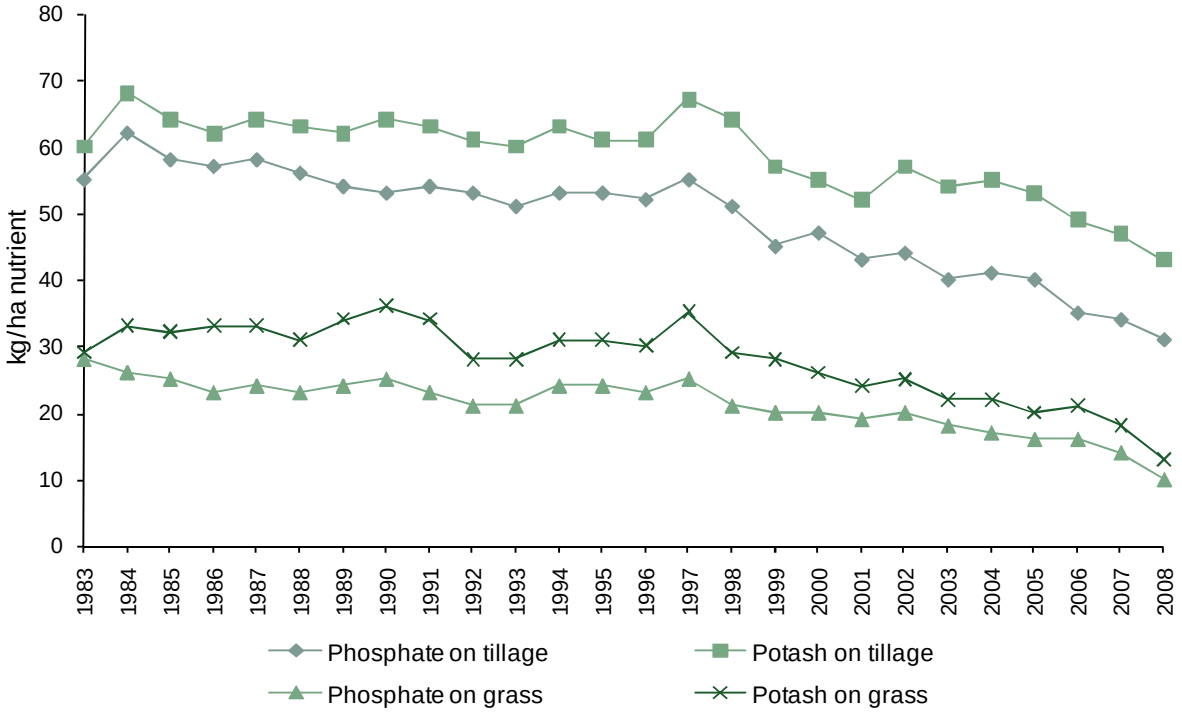


2004 and 2008, overall potash use on tillage crops averaged 49 kg/ha, the rate of 43 kg/ha in 2008 being the lowest level recorded since 1983 (a 39% fall from the peak value of 68 kg/ha in 1984).

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 2008. Overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decline despite temporary recorded increases.

Overall rates of phosphate and potash applied to tillage crops are nearly double those used on grassland. However there is greater use of manures on grassland (34% cover) than on tillage crops (22% cover).

Figure B2.4 Overall application rates (kg/ha) phosphate and potash on tillage crops and grassland, Great Britain 1983 – 2008



B2.2.1 Phosphate and potash use on major tillage crops

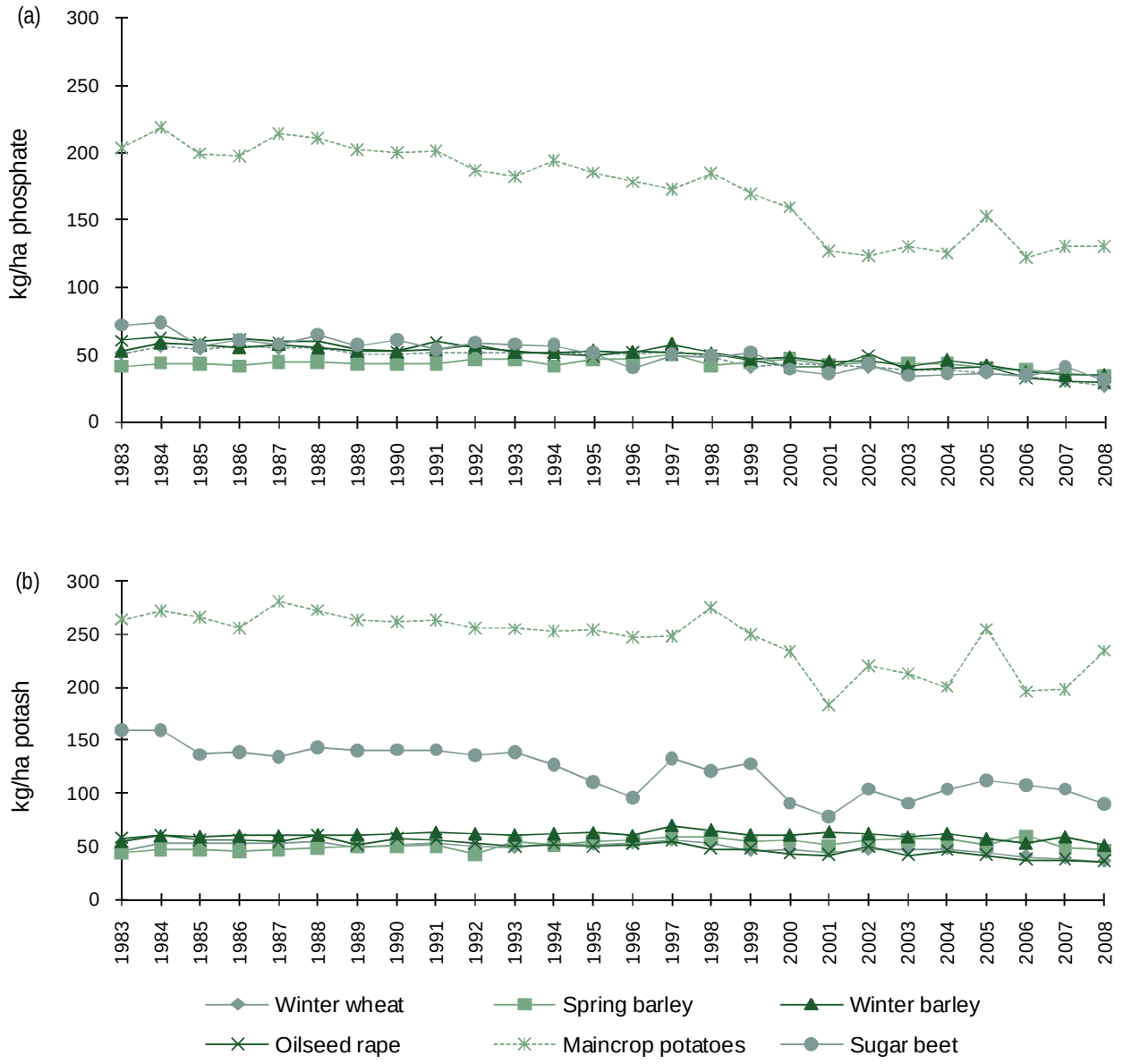
Overall application rates of phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.5.

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.

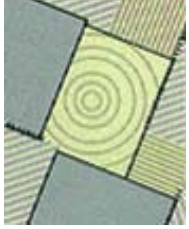
Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.5(a)); the mean for the five year period 1998-2002 showed a drop to below 50 kg/ha for the first time in both crops (43 kg/ha for winter wheat and 47 kg/ha for winter barley). This downward trend continued with a fall to 34 and 39 kg/ha for winter wheat and winter barley respectively for the 2004-2008 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 in 2004-2008, except in winter barley and potatoes where they are stable against 2007.

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 2004-2008 suggest the downward trend may be continuing (mean: 40, 218, 104 kg/ha).

Figure B2.5 Overall application rates (kg/ha) of (a) phosphate and (b) potash on major arable crops, Great Britain 1983 – 2008



Much of the long term reduction in the overall rates of application of phosphate and potash to combinable arable crops results more from a decrease in the dressing cover than from a reduction in the average application rates.



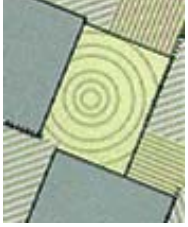
SECTION C - TABLES

CONTENTS

GREAT BRITAIN TABLES 2008

ENGLAND AND WALES TABLES 2008

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.



SCOTLAND TABLES 2008

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 2008

	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	84	24	47	58	85	46	42	72	11	20	40
Winter wheat	98	45	47	17	181	61	76	178	27	36	1971
Spring barley	95	71	76	33	99	48	62	94	34	47	735
Winter barley	98	62	69	19	138	56	74	134	35	51	611
Oats	80	51	52	14	103	50	73	83	26	38	193
Rye/triticale/Durum wheat	51	10	25	37	140	56	79	71	6	20	47
Potatoes (seed or earlies)	100	100	100	10	150	158	216	150	158	216	13
Potatoes (maincrop)	99	88	94	29	156	147	249	154	130	235	98
Sugar beet	93	54	80	31	92	58	112	86	31	90	135
Spring oilseed rape	99	72	84	12	115	67	75	114	48	63	18
Winter oilseed rape	99	48	50	11	194	61	70	193	29	35	564
Linseed	96	13	35	29	60	42	53	58	6	18	27
Forage maize	70	60	39	91	59	52	79	41	32	30	199
Rootcrops for stockfeed	80	65	67	63	68	85	72	54	55	48	53
Leafy forage crops	72	66	66	48	75	41	41	54	27	27	43
Arable silage/other fodder crops	39	29	30	57	89	36	45	35	11	14	79
Peas - human consumption	2	36	41	2	24	67	72	0	24	30	36
Peas - animal consumption	1	35	44	3	37	64	79	1	22	35	40
Beans - animal consumption	6	38	38	8	15	59	66	1	22	25	163
Vegetables (brassicae)	100	100	100	30	120	69	115	120	69	115	30
Vegetables (other)	80	62	86	25	97	66	102	78	41	87	67
Soft Fruit	95	89	92	0	32	19	66	30	17	61	11
Top Fruit	63	25	43	5	71	54	106	44	14	45	34
Other tillage	48	41	41	8	84	77	157	40	32	64	73
All tillage	91	52	55	22	155	59	79	140	31	43	5280
Grass under 5 years old	80	57	58	46	122	31	46	97	18	26	933
Grass 5 years and over	53	39	39	32	87	22	27	46	9	11	2332
All grass	58	42	42	34	95	24	32	55	10	13	3265
All crops and grass	73	47	48	28	130	42	57	95	20	27	8545

Source: British Survey of Fertiliser Practice 2008

Table GB1.2 Use of straight fertiliser, Great Britain 2008

	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	47	1	2	114	57	174	54	1	3	40
Winter wheat	95	8	11	177	73	87	169	6	9	1971
Spring barley	64	3	7	88	72	90	56	2	6	735
Winter barley	91	5	8	132	69	85	120	3	7	611
Oats	66	2	9	109	94	89	72	2	8	193
Rye/triticale/Durum wheat	47	0	14	143	0	92	67	0	13	47
Potatoes (seed or earlies)	20	0	0	93	0	0	18	0	0	13
Potatoes (maincrop)	40	1	22	99	102	219	40	1	48	98
Sugar beet	88	3	26	88	122	112	77	4	29	135
Spring oilseed rape	80	0	18	114	0	52	91	0	9	18
Winter oilseed rape	99	8	9	187	80	92	184	6	8	564
Linseed	82	0	9	59	0	69	48	0	6	27
Forage maize	36	6	10	72	71	107	25	4	11	199
Rootcrops for stockfeed	19	0	1	80	0	111	15	0	2	53
Leafy forage crops	20	0	1	48	0	10	10	0	0	43
Arable silage/other fodder crops	23	2	3	94	99	103	22	2	3	79
Peas - human consumption	0	9	13	0	111	75	0	10	9	36
Peas - animal consumption	1	0	9	37	0	78	1	0	7	40
Beans - animal consumption	0	8	8	0	76	62	0	6	5	163
Vegetables (brassicae)	39	0	2	101	0	119	40	0	3	30
Vegetables (other)	49	4	1	101	92	301	50	4	3	67
Soft Fruit	13	6	9	91	37	129	12	2	12	11
Top Fruit	63	2	9	64	26	129	40	1	11	34
Other tillage	27	12	15	76	75	146	20	9	22	73
All tillage	80	6	10	155	75	95	125	5	9	5280
Grass under 5 years old	43	1	1	106	34	112	46	0	2	933
Grass 5 years and over	21	0	0	87	43	78	18	0	0	2332
All grass	25	0	1	93	39	93	23	0	0	3265
All crops and grass	51	3	5	139	73	95	71	2	5	8545

Source: British Survey of Fertiliser Practice 2008

Table GB1.3 Use of compound fertiliser, Great Britain 2008

	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	40	23	45	45	45	36	18	10	16	40
Winter wheat	12	37	38	74	58	70	9	21	26	1971
Spring barley	61	68	70	64	47	59	39	32	41	735
Winter barley	23	58	61	63	54	71	15	31	44	611
Oats	21	49	47	53	48	64	11	23	30	193
Rye/triticale/Durum wheat	5	10	11	77	56	62	4	6	7	47
Potatoes (seed or earlies)	100	100	100	132	158	216	132	158	216	13
Potatoes (maincrop)	78	87	81	147	148	230	114	128	187	98
Sugar beet	13	51	55	65	53	111	9	27	61	135
Spring oilseed rape	36	72	72	66	67	75	24	48	54	18
Winter oilseed rape	19	41	42	46	57	65	9	23	27	564
Linseed	14	13	26	65	42	47	9	6	12	27
Forage maize	47	55	31	34	50	63	16	28	20	199
Rootcrops for stockfeed	63	65	66	62	85	71	39	55	47	53
Leafy forage crops	66	66	65	67	41	41	44	27	27	43
Arable silage/other fodder crops	20	28	28	65	33	39	13	9	11	79
Peas - human consumption	2	27	29	24	51	71	0	14	20	36
Peas - animal consumption	0	35	35	0	64	79	0	22	28	40
Beans - animal consumption	6	30	33	15	55	61	1	16	20	163
Vegetables (brassicae)	100	100	100	80	69	112	80	69	112	30
Vegetables (other)	59	62	85	48	60	99	28	37	84	67
Soft Fruit	81	83	89	22	18	55	18	15	49	11
Top Fruit	21	23	34	21	57	100	4	13	34	34
Other tillage	34	37	37	57	61	115	20	22	42	73
All tillage	24	45	46	65	57	73	16	26	34	5280
Grass under 5 years old	54	56	57	95	31	44	51	17	25	933
Grass 5 years and over	39	39	39	71	22	27	28	8	10	2332
All grass	42	42	42	77	24	31	32	10	13	3265
All crops and grass	33	43	44	73	40	52	24	17	23	8545

Source: British Survey of Fertiliser Practice 2008

Table GB1.4 Use of lime, Great Britain 2008

	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	22.2	-	1.1	-	4.4	27.7	2.8	-	6.3	-	1.7	3.1	8	40
Winter wheat	4.1	1.2	1.0	0.2	0.8	7.2	4.7	5.2	4.2	3.0	3.5	4.5	121	1971
Spring barley	6.1	0.4	5.7	-	2.4	14.6	4.4	5.3	4.3	-	2.1	3.9	116	735
Winter barley	2.1	0.4	2.3	0.9	1.6	7.3	4.6	6.2	4.6	2.5	3.5	4.3	48	611
Oats	2.3	1.1	1.8	-	0.3	5.6	4.7	5.0	5.2	-	0.5	4.0	15	193
Rye/triticale/Durum wheat	1.4	1.9	11.9	-	6.1	21.4	5.0	5.5	3.3	-	3.7	4.0	8	47
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	13
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	98
Sugar beet	4.4	2.3	1.0	12.9	-	20.6	3.6	4.3	5.0	6.4	-	5.7	30	135
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	18
Winter oilseed rape	8.7	1.9	1.7	0.2	1.3	13.8	4.0	4.9	4.5	4.8	2.6	4.2	53	564
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Forage maize	14.8	0.9	0.4	-	3.0	19.1	4.4	4.7	2.5	-	4.3	4.4	40	199
Rootcrops for stockfeed	3.6	-	2.3	-	2.4	8.3	2.8	-	5.0	-	2.2	3.0	5	53
Leafy forage crops	10.6	-	2.3	-	10.9	23.8	5.1	-	7.5	-	1.0	3.7	10	43
Arable silage/other fodder crops	2.6	0.5	7.7	-	1.9	12.6	3.6	3.8	4.2	-	5.0	4.1	12	79
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	36
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	2	40
Beans - animal consumption	3.1	2.6	-	1.1	0.2	7.0	4.6	3.8	-	2.0	1.0	3.8	11	163
Vegetables (brassicae)	24.4	1.9	-	-	10.0	36.3	5.0	4.8	-	-	3.5	4.6	11	30
Vegetables (other)	21.0	-	-	5.7	2.1	28.8	4.8	-	-	5.0	3.0	4.6	8	67
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	11
Top Fruit	9.9	-	-	-	8.6	18.4	5.0	-	-	-	2.0	3.2	5	34
Other tillage	3.1	3.6	0.2	-	0.1	7.0	1.4	3.1	1.0	-	0.5	1.7	7	73
All tillage	5.3	1.1	1.9	0.6	1.3	10.2	4.4	4.9	4.4	5.4	2.8	4.2	513	5280
Grass under 5 years old	2.4	0.3	0.8	-	2.9	6.5	4.9	5.9	6.9	-	2.6	4.6	66	933
Grass 5 years and over	1.7	0.1	0.3	-	2.1	4.2	4.0	4.2	5.5	-	2.2	3.4	114	2332
All grass	1.8	0.1	0.4	-	2.3	4.6	4.2	5.3	6.2	-	2.3	3.9	180	3265
All crops and grass	3.5	0.6	1.1	0.3	1.8	7.3	4.4	4.9	4.8	5.4	2.6	4.1	693	8545

Source: British Survey of Fertiliser Practice 2008

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2008

	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	49	35	35	20	79	19	21	38	7	7	1541
Grazed mown	71	51	52	56	108	27	40	77	14	21	1406
All grazings	57	41	41	33	92	23	30	52	9	12	2947
Cut for silage - grazed	79	59	61	66	116	28	43	91	16	26	1008
Cut for silage - not grazed	89	73	77	58	145	40	54	129	29	41	201
All cut for silage	80	61	63	65	121	30	44	96	18	28	1209
Cut for hay - grazed	52	30	28	35	72	21	23	38	6	7	443
Cut for hay - not grazed	70	41	40	23	86	28	44	60	12	18	96
All cut for hay	54	31	29	34	74	22	26	40	7	8	539
All mowings	73	53	54	56	112	29	42	81	15	23	1694
All grass	58	42	42	34	95	24	32	55	10	13	3265

Source: British Survey of Fertiliser Practice 2008

Table GB3.0 Product use by month of application, Great Britain 2008

(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	8	28	40	17	4	2	1	2118
Straight P	22	13	5	1	1	11	13	14	4	0	1	14	64
Straight K	7	7	15	5	7	22	14	13	5	1	1	2	93
Compounds	7	6	3	1	1	6	19	29	14	7	3	4	1481
All fertilisers	4	3	2	1	1	7	24	34	15	5	2	2	3762

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total nutrient ('000 tonnes)
Nitrogen	1	0	0	0	0	6	26	40	18	6	2	1	895
Phosphate	12	11	4	1	1	9	17	24	10	3	2	5	185
Potash	10	10	5	2	2	11	18	22	10	4	2	4	257
Total	4	4	2	0	1	7	23	34	15	5	2	2	1337

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 2008.

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

(e.g. 100 kg of a 20 : 20 : 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 2008

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2008

column %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not specified	all grass	all crops and grass
Ammonium Nitrate	34.7	50.9	7.0	22.3	49.7	16.6	43.4	29.1	32.8	24.1	49.6	28.0	40.0
Urea	1.4	6.5	1.1	3.0	7.6	1.3	5.3	2.0	2.9	1.4	0.0	1.9	4.5
Calcium Ammonium Nitrate (CAN)	1.9	1.0	0.0	0.3	0.6	1.1	1.0	1.2	0.8	1.1	2.0	1.2	1.1
Urea Ammonium Nitrate (UAN)	4.7	10.0	1.3	2.9	10.7	2.4	8.3	2.5	2.3	2.5	0.0	2.4	7.0
Other Straight N	1.0	2.6	0.5	0.0	4.8	2.7	2.6	2.3	0.8	2.4	0.0	2.1	2.4
Triple Superphosphate (TSP)	0.7	1.2	0.3	2.2	1.9	2.3	1.3	0.3	0.1	0.4	0.0	0.3	1.1
Other Straight P	1.9	0.7	0.0	0.7	2.4	0.7	1.1	0.5	4.9	0.7	0.8	0.8	1.0
Muriate of Potash (MOP)	2.2	2.2	5.5	0.8	1.7	4.4	2.4	0.5	0.6	0.6	3.7	0.6	2.0
Other Straight K	0.8	0.3	0.7	23.9	0.5	1.3	1.2	0.4	0.0	0.3	0.0	0.3	1.0
PK	10.0	13.7	8.7	30.6	8.8	15.5	13.0	2.7	2.5	3.2	10.2	2.8	10.7
NK	2.5	1.5	0.0	1.4	1.3	2.4	1.6	4.4	2.0	6.8	3.1	4.5	2.2
Low N (<19% N)	20.4	3.1	73.4	10.8	6.6	34.0	11.3	3.8	3.9	3.3	2.0	3.9	9.6
High N (>=19% N)	17.2	5.5	0.9	0.0	2.3	14.2	6.8	50.0	46.4	53.0	28.7	51.0	16.6
Other	0.6	0.7	0.4	1.1	1.0	1.2	0.8	0.2	0.0	0.2	0.0	0.3	0.7
Total product ('000 tonnes)	**328**	**1615**	**79**	**89**	**449**	**131**	**2691**	**953**	**87**	**556**	**8**	**1071**	**3762**

Source: British Survey of Fertiliser Practice 2008

Table GB3.2 Use of product type by crop group, Great Britain 2008

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	8.8	67.8	0.5	1.7	19.2	2.0	81.5	91.8	11.7	44.9	1.3	18.5	1506
Urea	3.0	72.9	0.3	1.2	21.7	0.9	89.5	91.5	6.2	46.4	0.0	10.5	165
Calcium Ammonium Nitrate (CAN)	27.3	56.9	0.0	1.6	12.2	2.0	64.4	88.0	0.8	49.9	3.4	35.6	35
Urea Ammonium Nitrate (UAN)	6.3	72.2	0.3	1.1	19.0	1.2	94.1	91.8	6.4	62.9	0.0	5.9	300
Other Straight N	5.5	59.0	0.3	0.0	30.2	4.9	74.2	98.6	3.6	50.4	0.0	25.8	100
Triple Superphosphate (TSP)	8.8	56.6	1.1	3.6	16.2	13.7	94.9	86.0	0.7	56.8	0.0	5.1	37
Other Straight P	7.0	59.3	0.0	2.3	29.8	1.7	89.2	77.8	53.3	61.5	1.5	10.8	27
Muriate of Potash (MOP)	10.6	57.2	7.9	1.4	12.2	10.8	94.4	75.0	12.1	78.3	6.9	5.6	61
Other Straight K	15.4	12.6	2.1	61.0	6.1	2.8	93.7	100.0	0.0	47.5	0.0	6.3	33
PK	8.2	61.0	1.8	9.6	11.6	7.9	93.5	81.4	7.6	66.2	1.8	6.5	366
NK	25.4	46.1	0.0	1.8	11.8	15.0	50.4	88.2	1.2	94.8	0.2	49.6	93
Low N (<19% N)	29.8	17.4	24.0	3.0	9.9	15.9	87.1	88.7	5.4	48.9	0.3	12.9	282
High N (>=19% N)	42.4	43.2	0.7	0.0	5.6	8.1	18.2	88.0	7.6	51.2	0.5	81.8	732
Other	8.5	60.7	2.1	5.7	15.0	7.9	85.6	43.2	0.0	63.7	0.0	14.4	25
All Fertilisers	**12.2**	**60.0**	**2.9**	**3.3**	**16.7**	**4.9**	**71.5**	**89.0**	**8.2**	**51.9**	**0.7**	**28.5**	**3762**

Source: British Survey of Fertiliser Practice 2008

Table GB3.3 Product use by month of application, Great Britain 2008

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	7.5	27.0	40.1	18.2	3.8	1.5	0.8	0.4	0.4	0.2	0.0	1506
Urea	0.0	8.1	27.4	34.8	17.9	7.7	4.1	0.0	0.0	0.0	0.0	0.0	165
Calcium Ammonium Nitrate (CAN)	0.0	3.2	20.2	39.8	19.7	9.9	4.9	1.8	0.0	0.4	0.0	0.0	35
Urea Ammonium Nitrate (UAN)	0.0	8.0	29.6	43.4	15.8	2.1	0.7	0.2	0.3	0.0	0.0	0.0	300
Other Straight N	0.4	9.0	48.7	30.8	3.7	1.7	4.3	0.6	0.4	0.2	0.2	0.0	100
Triple Superphosphate (TSP)	0.0	10.8	20.2	20.0	4.8	0.1	0.9	13.0	7.3	13.0	7.2	2.6	37
Other Straight P	2.0	10.3	3.8	5.5	3.3	0.4	0.4	15.4	42.7	12.9	3.2	0.0	27
Muriate of Potash (MOP)	0.7	19.9	19.7	16.9	6.4	1.3	1.4	1.6	9.9	7.7	11.8	0.7	61
Other Straight K	18.7	26.4	4.7	4.8	1.2	0.1	0.1	2.0	3.0	6.2	20.6	12.2	33
PK	3.1	13.5	10.4	4.5	2.4	0.2	0.1	6.8	22.6	22.9	9.2	3.9	366
NK	1.4	2.3	30.4	17.6	19.5	19.0	5.1	2.6	0.1	0.0	1.4	0.0	93
Low N (<19% N)	0.3	6.7	25.9	38.0	14.1	2.1	0.7	2.0	7.0	2.4	0.6	0.1	282
High N (>=19% N)	0.0	1.9	20.3	39.1	19.7	10.8	5.2	2.4	0.4	0.2	0.1	0.0	732
Other	2.6	3.6	39.4	19.5	12.9	8.2	0.0	7.0	2.5	3.5	0.0	0.0	25
All Fertilisers	**0.6**	**7.3**	**24.3**	**34.2**	**15.5**	**5.0**	**2.2**	**2.1**	**3.6**	**3.0**	**1.5**	**0.5**	**3762**

Source: British Survey of Fertiliser Practice 2008

Table GB4.1 Average fertiliser practice on cereal farms, Great Britain 2008

	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	27	27	17	109	55	84	109	15	23	8
Winter wheat	99	49	48	15	186	63	74	183	31	35	1065
Spring barley	95	65	72	21	110	54	72	105	35	52	251
Winter barley	98	65	72	12	141	62	78	138	40	56	239
Oats	85	49	45	5	109	56	77	92	27	35	87
Rye/triticale/Durum wheat	53	0	42	32	168	0	85	88	0	35	12
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	4
Potatoes (maincrop)	93	65	93	13	191	168	267	177	110	248	15
Sugar beet	92	55	81	12	97	69	105	90	38	85	46
Spring oilseed rape	100	66	81	15	117	69	77	117	45	62	14
Winter oilseed rape	100	49	49	9	194	64	66	193	31	32	358
Linseed	97	5	27	38	58	26	53	56	1	14	17
Forage maize	69	22	31	79	55	55	84	38	12	26	26
Rootcrops for stockfeed	100	66	71	66	88	85	96	88	56	68	11
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	2
Arable silage/other fodder crops	23	9	5	21	110	76	53	26	7	2	14
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	3
Peas - animal consumption	2	40	40	2	37	65	80	1	26	32	24
Beans - animal consumption	7	41	41	8	15	58	62	1	24	26	121
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	2
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	3
Soft Fruit	-	-	-	-	-	-	-	-	-	-	1
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	35	25	23	12	45	44	53	16	11	12	19
All tillage	92	50	52	14	169	62	74	155	31	39	2342
Grass under 5 years old	81	45	46	20	110	36	55	89	16	25	146
Grass 5 years and over	42	17	17	4	71	27	35	30	5	6	387
All grass	50	23	23	7	84	31	43	42	7	10	533
All crops and grass	85	46	47	13	161	59	72	138	27	34	2875

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

Source: British Survey of Fertiliser Practice 2008

Table GB4.2 Average fertiliser practice on general cropping and horticultural farms, Great Britain 2008

	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	60	5	8	40	114	72	153	69	4	13	8
Winter wheat	98	36	44	13	172	59	84	169	21	37	530
Spring barley	94	65	73	12	99	43	61	94	28	45	170
Winter barley	97	57	70	6	130	51	78	125	29	55	170
Oats	87	47	62	3	99	44	91	86	21	57	33
Rye/triticale/Durum wheat	56	2	14	34	170	63	98	96	1	14	14
Potatoes (seed or earlies)	100	100	100	0	116	126	177	116	126	177	6
Potatoes (maincrop)	99	91	95	29	152	143	249	151	131	236	74
Sugar beet	97	58	85	34	90	53	116	87	31	99	78
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	4
Winter oilseed rape	100	50	59	10	198	56	89	198	28	53	140
Linseed	-	-	-	-	-	-	-	-	-	-	4
Forage maize	70	26	7	78	59	65	68	41	17	4	11
Rootcrops for stockfeed	92	60	67	56	65	86	55	60	52	37	7
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	43	23	37	75	96	35	73	41	8	27	9
Peas - human consumption	2	45	51	1	24	67	72	1	30	37	31
Peas - animal consumption	0	22	55	0	0	53	79	0	11	43	12
Beans - animal consumption	0	28	28	3	0	60	97	0	17	27	26
Vegetables (brassicae)	100	100	100	15	145	83	141	145	83	141	22
Vegetables (other)	81	65	90	22	97	65	100	78	43	89	54
Soft Fruit	100	94	97	0	32	19	66	32	18	64	10
Top Fruit	63	25	43	5	71	54	106	44	14	45	34
Other tillage	65	60	62	6	101	88	190	66	53	117	49
All tillage	91	49	59	14	146	63	100	133	31	59	1499
Grass under 5 years old	76	50	51	23	113	36	47	86	18	24	101
Grass 5 years and over	51	28	29	9	71	23	26	36	6	8	186
All grass	58	34	35	13	87	28	35	51	10	12	287
All crops and grass	85	46	55	14	139	59	92	118	27	51	1786

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 2008

Table GB4.3 Average fertiliser practice on dairy farms, Great Britain 2008

	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	67	67	84	72	48	55	72	32	37	9
Winter wheat	99	52	58	53	147	50	68	146	26	40	84
Spring barley	96	67	73	80	73	41	51	70	27	37	48
Winter barley	100	73	75	70	128	48	61	128	36	46	41
Oats	100	6	11	94	106	25	69	106	2	7	8
Rye/triticale/Durum wheat	32	9	9	49	53	45	45	17	4	4	6
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	0
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	4
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	88	84	48	97	59	51	75	52	43	36	89
Rootcrops for stockfeed	100	100	100	87	58	44	51	58	44	51	5
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/other fodder crops	65	44	44	90	81	32	34	53	14	15	28
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	2
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	1
All tillage	91	65	55	77	99	49	65	90	31	36	331
Grass under 5 years old	92	60	64	81	158	32	55	145	19	35	207
Grass 5 years and over	83	59	61	63	131	26	37	108	15	22	473
All grass	85	59	62	67	138	27	41	117	16	25	680
All crops and grass	86	60	61	68	131	31	44	113	19	27	1011

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

Source: British Survey of Fertiliser Practice 2008

Table GB4.4 Average fertiliser practice on other livestock farms, Great Britain 2008

	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	-	-	-	-	-	-	-	-	-	-	2
Winter wheat	100	81	91	38	151	39	57	151	31	52	41
Spring barley	95	89	87	60	81	42	46	77	38	40	132
Winter barley	100	75	74	55	106	37	45	106	28	33	41
Oats	80	72	72	24	70	37	41	56	27	30	19
Rye/triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	1
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	46	60	44	63	62	53	69	29	32	30	26
Rootcrops for stockfeed	96	91	91	52	61	88	68	58	80	62	19
Leafy forage crops	79	79	79	52	79	39	38	62	31	30	27
Arable silage/other fodder crops	19	39	37	56	60	13	14	11	5	5	16
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetables (other)	-	-	-	-	-	-	-	-	-	-	1
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	89	76	80	55	91	42	46	81	32	37	330
Grass under 5 years old	79	67	67	42	94	28	36	75	19	24	291
Grass 5 years and over	46	38	38	31	65	19	21	30	7	8	983
All grass	49	41	41	32	70	20	24	34	8	10	1274
All crops and grass	52	43	43	33	72	23	26	37	10	11	1604

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 2008

Table GB4.5 Average fertiliser practice on mixed farms, Great Britain 2008

	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	75	41	41	62	125	43	53	94	18	22	13
Winter wheat	94	39	41	29	189	55	77	177	21	32	235
Spring barley	96	79	82	56	92	48	57	89	38	47	132
Winter barley	99	55	56	25	151	56	69	149	31	38	114
Oats	61	56	60	34	98	46	66	60	26	40	46
Rye/triticale/Durum wheat	48	31	31	43	85	56	61	40	17	19	14
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	2
Potatoes (maincrop)	100	87	87	48	154	160	219	154	139	190	8
Sugar beet	66	6	20	90	85	74	94	56	4	18	11
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	97	40	41	32	184	45	62	180	18	25	57
Linseed	92	61	85	0	73	48	52	66	29	45	6
Forage maize	51	40	27	94	64	57	99	32	23	27	44
Rootcrops for stockfeed	32	29	29	75	63	108	97	20	31	28	11
Leafy forage crops	36	36	36	64	35	16	16	12	6	6	8
Arable silage/other fodder crops	19	31	43	33	141	75	102	26	24	44	10
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	2
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	4
Beans - animal consumption	0	18	8	7	0	98	121	0	17	10	10
Vegetables (brassicae)	100	100	100	100	24	29	40	24	29	40	6
Vegetables (other)	64	64	64	52	89	92	92	57	58	58	7
Soft Fruit	-	-	-	-	-	-	-	-	-	-	0
Top Fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	4
All tillage	87	50	51	40	149	54	70	130	27	36	744
Grass under 5 years old	70	47	47	29	119	32	47	83	15	22	181
Grass 5 years and over	53	33	30	13	81	25	31	43	8	9	293
All grass	58	37	35	18	95	28	37	55	10	13	474
All crops and grass	71	43	43	28	124	41	55	89	18	23	1218

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

Source: British Survey of Fertiliser Practice 2008

Table EW1.1 Total fertiliser use, England & Wales 2008

	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	92	17	45	52	82	43	29	76	7	13	30
Winter wheat	98	43	45	18	182	60	74	178	26	33	1840
Spring barley	94	49	58	24	104	46	63	98	23	36	434
Winter barley	97	58	65	18	136	54	73	133	32	48	533
Oats	83	47	50	14	108	53	77	89	25	38	156
Rye/triticale/Durum wheat	48	7	22	37	142	56	81	69	4	18	42
Potatoes (seed or earlies)	100	100	100	28	146	146	194	146	146	194	5
Potatoes (maincrop)	98	86	93	29	159	147	256	156	126	237	81
Sugar beet	93	54	80	31	92	58	112	86	31	90	135
Spring oilseed rape	99	72	84	12	115	67	75	114	48	63	17
Winter oilseed rape	99	46	48	11	195	61	70	193	29	34	525
Linseed	96	13	35	29	60	42	53	58	6	18	27
Forage maize	70	60	38	90	60	53	82	42	32	31	191
Rootcrops for stockfeed	64	38	55	62	70	49	61	44	19	34	23
Leafy forage crops	69	58	58	41	56	31	31	38	18	18	24
Arable silage/other fodder crops	36	25	26	52	96	35	43	34	9	11	70
Vining peas (for human consumption)	2	38	43	1	24	67	72	0	25	31	34
Field peas (harvested dry)	1	34	43	3	37	64	80	1	22	34	39
Field beans (harvested dry)	6	37	37	8	15	60	64	1	22	24	156
Vegetables (brassicae)	100	100	100	25	112	66	109	112	66	109	27
Vegetable Other	83	64	88	25	98	64	99	81	41	87	60
Soft Fruit	94	87	91	0	32	14	50	30	12	46	8
Top Fruit	63	25	43	5	71	54	106	44	14	45	34
Other tillage	46	39	39	9	87	79	163	40	31	64	71
All tillage	90	46	50	20	160	60	79	144	28	40	4562
Grass less than five years old	78	51	52	53	123	28	45	96	14	24	685
Grass five years and over	50	35	35	34	88	21	27	44	7	10	1972
All grass	55	37	38	37	96	23	31	52	9	12	2657
All crops and grass	72	42	44	29	136	43	58	98	18	26	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.2 Use of straight fertiliser, England & Wales 2008

	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	51	1	1	115	57	97	59	1	1	30
Winter wheat	95	9	10	178	73	85	170	6	9	1840
Spring barley	76	6	10	103	71	93	78	4	9	434
Winter barley	91	5	9	132	69	87	120	4	8	533
Oats	74	3	10	110	94	83	82	3	8	156
Rye/triticale/Durum wheat	47	0	15	142	0	92	67	0	13	42
Potatoes (seed or earlies)	0	0	0	0	0	0	0	0	0	5
Potatoes (maincrop)	45	2	24	106	102	219	47	2	53	81
Sugar beet	88	3	26	88	122	112	77	4	29	135
Spring oilseed rape	79	0	18	114	0	52	90	0	9	17
Winter oilseed rape	99	8	9	188	80	91	185	6	8	525
Linseed	82	0	9	59	0	69	48	0	6	27
Forage maize	36	6	10	72	71	107	26	4	11	191
Rootcrops for stockfeed	33	0	2	81	0	111	27	0	3	23
Leafy forage crops	15	0	3	49	0	10	7	0	0	24
Arable silage/other fodder crops	25	2	3	96	99	103	24	2	3	70
Peas - human consumption	0	10	13	0	111	75	0	11	10	34
Peas - animal consumption	1	0	9	37	0	78	1	0	7	39
Beans - animal consumption	0	8	7	0	76	58	0	6	4	156
Vegetables (brassicae)	33	0	0	94	0	0	31	0	0	27
Vegetables (other)	51	4	0	103	92	0	52	4	0	60
Soft Fruit	16	7	11	91	37	129	15	3	14	8
Top Fruit	63	2	9	64	26	129	40	1	11	34
Other tillage	28	13	15	76	75	146	21	9	23	71
All tillage	83	7	10	160	75	94	133	5	10	4562
Grass under 5 years old	49	1	2	110	34	112	55	0	2	685
Grass 5 years and over	22	0	0	88	43	77	20	0	0	1972
All grass	27	1	1	94	39	93	25	0	1	2657
All crops and grass	55	4	5	144	73	94	79	3	5	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.3 Use of compound fertiliser, England & Wales 2008

	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	41	15	43	42	42	26	17	6	12	30
Winter wheat	10	34	35	77	57	69	8	20	24	1840
Spring barley	31	43	49	63	43	57	20	19	28	434
Winter barley	19	54	57	67	52	70	13	28	40	533
Oats	13	45	45	59	51	67	7	23	30	156
Rye/triticale/Durum wheat	2	7	8	79	56	60	2	4	5	42
Potatoes (seed or earlies)	100	100	100	146	146	194	146	146	194	5
Potatoes (maincrop)	73	84	80	150	148	232	109	125	185	81
Sugar beet	13	51	55	65	53	111	9	27	61	135
Spring oilseed rape	36	72	72	66	67	75	24	48	54	17
Winter oilseed rape	17	39	40	48	57	65	8	22	26	525
Linseed	14	13	26	65	42	47	9	6	12	27
Forage maize	47	54	30	34	51	65	16	28	20	191
Rootcrops for stockfeed	36	38	53	50	49	59	18	19	31	23
Leafy forage crops	58	58	56	53	31	32	31	18	18	24
Arable silage/other fodder crops	14	23	23	73	30	35	10	7	8	70
Peas - human consumption	2	28	30	24	51	71	0	14	21	34
Peas - animal consumption	0	34	34	0	64	80	0	22	27	39
Beans - animal consumption	6	29	33	15	55	60	1	16	20	156
Vegetables (brassicae)	100	100	100	82	66	109	82	66	109	27
Vegetables (other)	60	64	88	48	58	99	29	37	87	60
Soft Fruit	77	80	87	20	12	36	15	9	32	8
Top Fruit	21	23	34	21	57	100	4	13	34	34
Other tillage	32	35	35	59	61	119	19	21	42	71
All tillage	17	40	41	66	57	74	11	22	30	4562
Grass under 5 years old	48	49	51	87	28	42	42	14	21	685
Grass 5 years and over	35	35	35	70	21	27	25	7	9	1972
All grass	37	37	37	74	23	30	27	8	11	2657
All crops and grass	27	38	39	71	40	53	19	15	21	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.4 Use of lime, England & Wales 2008

	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	-	-	-	-	-	-	-	-	-	-	-	-	4	30
Winter wheat	4.1	1.3	0.8	0.2	0.6	6.9	4.7	5.2	4.2	3.0	4.4	4.6	104	1840
Spring barley	3.7	0.8	1.4	-	1.3	7.2	4.2	5.3	4.0	-	1.6	3.7	40	434
Winter barley	1.9	0.5	1.7	1.0	1.8	6.8	4.5	6.2	4.6	2.5	3.5	4.2	37	533
Oats	2.0	1.4	0.3	-	0.2	3.9	4.7	5.0	5.0	-	0.5	3.7	8	156
Rye/triticale/Durum wheat	-	2.0	12.5	-	6.4	20.9	-	5.5	3.3	-	3.7	3.8	7	42
Potatoes (seed or earlies)	-	-	-	-	-	-	-	-	-	-	-	-	0	5
Potatoes (maincrop)	-	-	-	-	-	-	-	-	-	-	-	-	0	81
Sugar beet	4.4	2.3	1.0	12.9	-	20.6	3.6	4.3	5.0	6.4	-	5.7	30	135
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	17
Winter oilseed rape	8.8	2.0	1.5	0.2	1.2	13.7	4.1	4.9	4.3	4.8	3.0	4.2	47	525
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	27
Forage maize	14.4	1.0	-	-	3.1	18.4	4.3	4.7	-	-	4.3	4.3	35	191
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	-	-	4	23
Leafy forage crops	7.0	-	4.0	-	19.1	30.1	6.5	-	7.5	-	1.0	3.5	7	24
Arable silage/other fodder crops	1.5	0.5	7.4	-	2.2	11.6	3.0	3.8	3.8	-	5.0	4.0	8	70
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	34
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	1	39
Beans - animal consumption	3.2	2.6	-	1.2	0.2	7.1	4.6	3.8	-	2.0	1.0	3.8	11	156
Vegetables (brassicae)	27.1	2.2	-	-	-	29.3	5.0	4.8	-	-	-	5.0	8	27
Vegetables (other)	21.6	-	-	6.0	2.2	29.8	5.3	-	-	5.0	3.0	4.9	7	60
Soft Fruit	-	-	-	-	-	-	-	-	-	-	-	-	1	8
Top Fruit	9.9	-	-	-	8.6	18.4	5.0	-	-	-	2.0	3.2	5	34
Other tillage	3.2	3.7	0.2	-	0.1	7.2	1.4	3.1	1.0	-	0.5	1.7	7	71
All tillage	5.1	1.3	1.1	0.7	1.0	9.2	4.4	4.9	4.4	5.4	3.1	4.3	373	4562
Grass under 5 years old	2.2	0.5	0.5	-	2.7	5.9	5.0	5.9	7.6	-	2.9	4.9	51	685
Grass 5 years and over	1.9	0.1	0.2	-	2.3	4.5	3.8	4.2	5.6	-	2.2	3.3	101	1972
All grass	2.0	0.1	0.2	-	2.4	4.7	4.1	5.3	6.7	-	2.4	3.9	152	2657
All crops and grass	3.5	0.7	0.6	0.3	1.7	6.9	4.3	4.9	5.1	5.4	2.8	4.2	525	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.5 Percentage of crop area by field application rate - Nitrogen, England & Wales 2008

	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	8	28	7	0	25	12	4	7	9	-	-	-	-	-	-	-	-	-	30
Winter wheat	2	0	1	2	6	4	7	19	20	22	9	3	2	-	-	-	-	-	1840
Spring barley	6	0	8	9	17	34	18	4	2	-	-	-	-	-	-	-	-	-	434
Winter barley	3	0	3	4	7	17	28	23	9	3	1	-	-	-	-	-	-	-	533
Oats	17	0	6	8	15	19	29	4	0	1	-	-	-	-	-	-	-	-	156
Rye/triticale/Durum wheat	52	0	8	0	1	4	16	1	11	0	8	-	-	-	-	-	-	-	42
Potatoes (seed or earlies)	0	0	14	0	0	19	0	0	53	14	-	-	-	-	-	-	-	-	5
Potatoes (maincrop)	2	3	3	3	11	11	8	12	20	13	1	5	3	3	-	-	-	-	81
Sugar beet	7	0	13	14	20	27	16	2	1	-	-	-	-	-	-	-	-	-	135
Spring oilseed rape	1	2	0	4	28	28	25	12	-	-	-	-	-	-	-	-	-	-	17
Winter oilseed rape	1	0	0	1	3	2	4	16	24	24	15	4	2	0	0	0	1	-	525
Linseed	4	5	42	19	23	3	4	-	-	-	-	-	-	-	-	-	-	-	27
Forage maize	30	18	9	22	9	6	5	-	-	-	-	-	-	-	-	-	-	-	191
Rootcrops for stockfeed	36	0	29	7	12	9	5	2	-	-	-	-	-	-	-	-	-	-	23
Leafy forage crops	31	9	28	17	2	8	4	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	64	0	5	8	9	5	4	3	0	0	2	-	-	-	-	-	-	-	70
Peas - human consumption	98	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
Peas - animal consumption	99	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	94	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156
Vegetables (brassicae)	0	23	2	11	4	8	17	6	15	3	11	-	-	-	-	-	-	-	27
Vegetables (other)	17	1	18	2	16	26	2	16	2	-	-	-	-	-	-	-	-	-	60
Soft Fruit	6	65	0	13	14	0	2	-	-	-	-	-	-	-	-	-	-	-	8
Top Fruit	37	10	13	8	20	0	10	3	-	-	-	-	-	-	-	-	-	-	34
Other tillage	54	2	7	9	10	10	0	4	4	-	-	-	-	-	-	-	-	-	71
All tillage	10	1	3	4	8	9	10	15	14	15	6	2	1	-	-	-	-	-	4562
Grass under 5 years old	22	1	9	14	12	10	10	9	4	3	2	1	1	1	2	-	-	-	685
Grass 5 years and over	50	2	15	12	6	4	5	2	2	1	1	1	-	-	-	-	-	-	1972
All grass	45	2	14	12	7	5	6	3	2	2	1	1	-	-	-	-	-	-	2657
All crops and grass	28	2	8	8	7	7	8	9	8	8	4	2	1	-	-	-	-	-	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.6 Percentage of crop area by field application rate - Phosphate, England & Wales 2008

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Spring wheat	83	3	9	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Winter wheat	57	3	12	18	8	2	-	-	-	-	-	-	-	-	-	-	-	-	1840
Spring barley	51	11	15	17	5	1	-	-	-	-	-	-	-	-	-	-	-	-	434
Winter barley	42	6	17	25	9	2	-	-	-	-	-	-	-	-	-	-	-	-	533
Oats	53	5	13	21	6	1	1	-	-	-	-	-	-	-	-	-	-	-	156
Rye/triticale/Durum wheat	93	0	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
Potatoes (seed or earlies)	0	0	14	0	0	19	0	0	53	14	-	-	-	-	-	-	-	-	5
Potatoes (maincrop)	14	0	1	4	12	10	16	13	16	6	1	2	5	-	-	-	-	-	81
Sugar beet	46	8	12	23	6	2	2	-	-	-	-	-	-	-	-	-	-	-	135
Spring oilseed rape	28	2	9	35	26	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Winter oilseed rape	54	4	10	22	7	2	1	1	-	-	-	-	-	-	-	-	-	-	525
Linseed	87	2	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Forage maize	40	13	9	29	4	1	3	0	1	-	-	-	-	-	-	-	-	-	191
Rootcrops for stockfeed	62	5	12	18	0	4	-	-	-	-	-	-	-	-	-	-	-	-	23
Leafy forage crops	42	35	15	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	75	15	3	3	1	2	1	-	-	-	-	-	-	-	-	-	-	-	70
Peas - human consumption	62	2	2	24	0	9	1	-	-	-	-	-	-	-	-	-	-	-	34
Peas - animal consumption	66	0	2	24	1	6	-	-	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	63	5	6	13	11	2	-	-	-	-	-	-	-	-	-	-	-	-	156
Vegetables (brassicae)	0	25	8	31	15	7	14	-	-	-	-	-	-	-	-	-	-	-	27
Vegetables (other)	36	7	9	32	11	0	5	-	-	-	-	-	-	-	-	-	-	-	60
Soft Fruit	13	65	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Top Fruit	75	10	2	0	5	8	-	-	-	-	-	-	-	-	-	-	-	-	34
Other tillage	61	6	12	5	7	0	1	8	-	-	-	-	-	-	-	-	-	-	71
All tillage	54	5	12	19	8	2	1	-	-	-	-	-	-	-	-	-	-	-	4562
Grass under 5 years old	49	27	16	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	685
Grass 5 years and over	65	24	9	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1972
All grass	63	24	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2657
All crops and grass	58	14	11	10	4	1	-	-	-	-	-	-	-	-	-	-	-	-	7219

Source: British Survey of Fertiliser Practice 2008

Table EW1.7 Percentage of crop area by field application rate - Potash, England & Wales 2008

	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	55	31	9	2	3	1	-	-	-	-	-	-	-	-	-	-	-	-	30
Winter wheat	55	2	9	12	14	5	2	1	-	-	-	-	-	-	-	-	-	-	1840
Spring barley	42	8	11	19	14	4	2	-	-	-	-	-	-	-	-	-	-	-	434
Winter barley	35	4	10	18	20	10	3	1	-	-	-	-	-	-	-	-	-	-	533
Oats	50	5	7	13	11	8	2	4	-	-	-	-	-	-	-	-	-	-	156
Rye/triticale/Durum wheat	78	0	1	5	8	8	-	-	-	-	-	-	-	-	-	-	-	-	42
Potatoes (seed or earlies)	0	0	0	14	0	19	0	0	0	14	0	53	-	-	-	-	-	-	5
Potatoes (maincrop)	7	4	0	0	4	3	1	3	9	11	5	15	5	15	1	8	4	5	81
Sugar beet	20	5	1	12	17	18	14	2	4	4	1	0	0	0	0	0	0	1	135
Spring oilseed rape	16	2	18	16	28	19	-	-	-	-	-	-	-	-	-	-	-	-	17
Winter oilseed rape	52	4	9	15	12	5	1	1	1	-	-	-	-	-	-	-	-	-	525
Linseed	65	2	10	17	5	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Forage maize	62	7	5	7	5	7	2	1	2	0	1	0	0	1	-	-	-	-	191
Rootcrops for stockfeed	45	20	9	7	10	2	0	8	-	-	-	-	-	-	-	-	-	-	23
Leafy forage crops	42	34	16	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	24
Arable silage/other fodder crops	74	12	5	4	3	1	0	0	1	0	1	-	-	-	-	-	-	-	70
Peas - human consumption	57	0	2	18	21	3	-	-	-	-	-	-	-	-	-	-	-	-	34
Peas - animal consumption	57	0	2	9	25	6	0	1	-	-	-	-	-	-	-	-	-	-	39
Beans - animal consumption	63	1	12	13	5	5	0	1	-	-	-	-	-	-	-	-	-	-	156
Vegetables (brassicae)	0	2	24	4	29	0	2	7	9	23	-	-	-	-	-	-	-	-	27
Vegetables (other)	12	8	13	18	7	4	19	7	10	2	-	-	-	-	-	-	-	-	60
Soft Fruit	9	65	0	2	0	0	7	4	13	-	-	-	-	-	-	-	-	-	8
Top Fruit	57	10	0	0	8	0	0	25	-	-	-	-	-	-	-	-	-	-	34
Other tillage	61	6	9	2	8	2	3	0	0	0	0	0	1	0	0	0	0	8	71
All tillage	50	4	9	13	13	6	3	1	1	-	-	-	-	-	-	-	-	-	4562
Grass under 5 years old	48	16	19	6	6	3	1	1	-	-	-	-	-	-	-	-	-	-	685
Grass 5 years and over	65	22	9	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1972
All grass	62	21	11	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2657
All crops and grass	56	12	10	8	8	3	1	1	-	-	-	-	-	-	-	-	-	-	7219

Source: British Survey of Fertiliser Practice 2008

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2008

	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	44	30	30	23	83	19	21	37	6	6	1214
Grazed mown	68	47	49	57	105	26	39	72	12	19	1246
All grazings	54	37	37	37	94	23	30	51	8	11	2460
Cut for silage - grazed	76	56	58	68	113	27	42	87	15	24	870
Cut for silage - not grazed	83	55	62	61	148	31	49	122	17	30	103
All cut for silage	77	56	58	67	116	27	42	89	15	25	973
Cut for hay - grazed	51	28	27	35	72	21	23	37	6	6	417
Cut for hay - not grazed	67	32	32	27	82	24	46	55	8	15	71
All cut for hay	53	29	27	34	73	22	25	39	6	7	488
All mowings	69	47	49	57	108	26	40	74	12	19	1413
All grass	55	37	38	37	96	23	31	52	9	12	2657

Source: British Survey of Fertiliser Practice 2008

Table EW2.2 Percentage of grass area by field application rate - Nitrogen, England & Wales 2008

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Grazed not mown	56	2	15	11	5	2	4	1	2	1	-	-	-	-	-	-	-	-	1214
Grazed mown	32	2	11	13	11	9	8	6	2	3	1	1	1	0	1	-	-	-	1246
All grazings	46	2	14	12	7	5	6	3	2	1	1	1	-	-	-	-	-	-	2460
Cut for silage - grazed	24	2	10	14	12	10	10	8	3	3	2	1	1	0	1	-	-	-	870
Cut for silage - not grazed	17	0	11	6	10	4	11	7	12	8	1	9	1	2	-	-	-	-	103
All cut for silage	23	2	10	13	12	10	10	8	4	4	2	2	1	0	1	-	-	-	973
Cut for hay - grazed	49	2	15	14	7	7	4	1	1	-	-	-	-	-	-	-	-	-	417
Cut for hay - not grazed	33	0	29	8	3	7	5	10	4	-	-	-	-	-	-	-	-	-	71
All cut for hay	47	2	16	14	7	7	4	2	1	-	-	-	-	-	-	-	-	-	488
All mowings	31	2	12	13	10	9	8	6	3	3	1	1	0	0	1	-	-	-	1413
All grass	45	2	14	12	7	5	6	3	2	2	1	1	-	-	-	-	-	-	2657

Source: British Survey of Fertiliser Practice 2008

Table EW2.3 Percentage of grass area by field application rate - Phosphate, England & Wales 2008

	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	70	22	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1214
Grazed mown	53	27	15	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1246
All grazings	63	24	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2460
Cut for silage - grazed	44	32	16	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	870
Cut for silage - not grazed	45	27	20	5	0	4	-	-	-	-	-	-	-	-	-	-	-	-	103
All cut for silage	44	32	17	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	973
Cut for hay - grazed	72	17	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	417
Cut for hay - not grazed	68	18	12	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	71
All cut for hay	71	17	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	488
All mowings	53	27	15	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1413
All grass	63	24	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2657

Source: British Survey of Fertiliser Practice 2008

Table EW2.4 Percentage of crop area by field application rate - Potash, England & Wales 2008

	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	70	21	7	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1214
Grazed mown	51	20	16	5	4	2	1	-	-	-	-	-	-	-	-	-	-	-	1246
All grazings	63	21	11	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2460
Cut for silage - grazed	42	23	18	7	6	2	1	1	-	-	-	-	-	-	-	-	-	-	870
Cut for silage - not grazed	38	21	15	11	8	1	5	1	-	-	-	-	-	-	-	-	-	-	103
All cut for silage	42	23	18	8	6	2	1	1	-	-	-	-	-	-	-	-	-	-	973
Cut for hay - grazed	73	16	9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	417
Cut for hay - not grazed	68	18	2	4	1	6	0	1	-	-	-	-	-	-	-	-	-	-	71
All cut for hay	73	17	8	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	488
All mowings	51	20	15	6	4	2	1	-	-	-	-	-	-	-	-	-	-	-	1413
All grass	62	21	11	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2657

Source: British Survey of Fertiliser Practice 2008

Table EW3.0 Product use by month of application, England & Wales 2008

(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	8	29	40	16	4	2	1	1962
Straight P	23	13	5	1	1	11	13	14	4	0	1	14	64
Straight K	8	7	16	5	8	23	14	12	4	1	1	2	87
Compounds	9	7	3	1	1	7	22	21	14	7	3	4	1079
All fertilisers	4	3	2	1	1	8	26	32	15	5	2	2	3197

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total nutrient ('000 tonnes)
Nitrogen	1	0	0	0	0	7	28	38	18	5	2	1	772
Phosphate	14	12	5	1	2	11	18	16	10	3	1	6	143
Potash	12	11	7	2	2	13	20	15	9	4	2	5	202
Total	4	4	2	1	1	8	25	31	15	5	2	2	1116

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 2008.

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

(e.g. 100 kg of a 20 : 20 : 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 2008

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2008

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	42.9	51.7	9.1	22.3	49.8	18.8	45.6	32.2	36.7	28.3	51.1	32.7	43.0
Urea	2.2	7.1	1.5	3.0	8.2	1.6	6.1	2.3	3.1	1.7	0.0	2.2	5.3
Calcium Ammonium Nitrate (CAN)	1.7	0.9	0.0	0.3	0.6	1.3	0.9	1.2	0.4	0.9	0.0	1.1	0.9
Urea Ammonium Nitrate (UAN)	6.1	10.3	0.5	2.9	10.9	2.4	8.8	3.0	2.7	3.2	0.0	3.0	7.6
Other Straight N	1.6	2.8	0.0	0.0	4.9	3.3	2.8	2.7	0.5	3.1	0.0	2.5	2.8
Triple Superphosphate (TSP)	1.0	1.3	0.4	2.2	2.1	2.7	1.5	0.3	0.2	0.6	0.0	0.4	1.3
Other Straight P	3.0	0.8	0.0	0.7	2.6	0.8	1.3	0.7	5.9	0.9	0.8	1.0	1.2
Muriate of Potash (MOP)	2.9	2.2	6.5	0.8	1.7	4.6	2.4	0.6	0.5	0.7	4.0	0.7	2.1
Other Straight K	0.6	0.3	1.0	23.9	0.5	1.4	1.4	0.5	0.0	0.4	0.0	0.4	1.2
PK	13.6	13.2	11.5	30.6	8.8	17.8	13.5	3.0	2.2	3.9	10.8	3.1	11.4
NK	2.2	1.3	0.0	1.4	1.0	2.9	1.4	4.9	2.0	8.0	3.3	5.1	2.1
Low N (<19% N)	7.3	1.8	68.1	10.8	5.5	29.4	7.6	3.2	3.3	2.5	2.1	3.2	6.7
High N (>=19% N)	14.1	5.6	1.3	0.0	2.5	12.1	6.0	45.2	42.6	45.4	27.9	44.3	13.6
Other	0.7	0.7	0.1	1.1	1.1	1.1	0.8	0.3	0.0	0.2	0.0	0.3	0.7
Total product ('000 tonnes)	**184**	**1501**	**60**	**89**	**431**	**121**	**2386**	**756**	**79**	**421**	**6**	**811**	**3197**

Source: British Survey of Fertiliser Practice 2008

Table EW3.2 Use of product type by crop group, England & Wales 2008

row %	spring cereal	winter cereal	potatoes	sugar beet	oilseed rape	other tillage	all tillage	grass for grazing	grass for hay	grass for silage	grass not specified	all grass	total product ('000 tonnes)
Ammonium Nitrate	7.0	68.7	0.5	1.8	19.9	2.1	82.5	91.9	12.9	44.9	1.2	17.5	1381
Urea	3.1	72.8	0.3	1.2	21.8	0.9	90.6	96.0	6.2	47.3	0.0	9.4	162
Calcium Ammonium Nitrate (CAN)	18.6	61.4	0.0	2.2	15.1	2.7	64.8	97.4	0.4	42.7	0.0	35.2	26
Urea Ammonium Nitrate (UAN)	5.5	72.4	0.1	1.1	19.6	1.2	93.9	91.5	6.6	62.7	0.0	6.1	284
Other Straight N	5.6	58.8	0.0	0.0	30.4	5.1	74.8	99.5	3.5	52.9	0.0	25.2	97
Triple Superphosphate (TSP)	8.4	56.9	1.1	3.6	16.3	13.8	94.9	86.0	0.7	56.8	0.0	5.1	36
Other Straight P	7.0	59.3	0.0	2.3	29.8	1.7	89.2	77.8	53.3	61.5	1.5	10.8	27
Muriate of Potash (MOP)	9.1	58.0	7.8	1.5	12.5	11.1	94.4	82.7	12.7	76.7	7.6	5.6	55
Other Straight K	13.4	12.9	2.2	62.7	6.2	2.6	93.6	100.0	0.0	47.5	0.0	6.4	32
PK	8.1	59.0	1.9	10.5	12.1	8.4	93.9	82.7	6.2	69.4	2.1	6.1	335
NK	18.2	46.0	0.0	2.3	13.6	19.8	46.1	88.3	1.2	96.6	0.2	53.9	77
Low N (<19% N)	7.8	19.7	29.2	5.2	14.6	23.5	85.6	98.2	4.4	49.8	0.4	14.4	167
High N (>=19% N)	21.6	59.5	1.1	0.0	8.2	9.7	18.5	95.0	10.0	50.3	0.7	81.5	495
Other	8.0	62.8	0.8	6.3	16.5	5.5	84.8	44.8	0.0	62.4	0.0	15.2	23
All Fertilisers	**7.7**	**62.9**	**2.5**	**3.7**	**18.1**	**5.1**	**74.6**	**93.3**	**9.8**	**52.0**	**0.8**	**25.4**	**3197**

Source: British Survey of Fertiliser Practice 2008

Table EW3.3 Product use by month of application, England & Wales 2008

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total product ('000 tonnes)
Ammonium Nitrate	0.1	7.8	27.8	40.2	17.6	3.5	1.3	0.8	0.4	0.4	0.1	0.0	1381
Urea	0.0	8.3	27.5	34.4	18.3	7.4	4.1	0.0	0.0	0.0	0.0	0.0	162
Calcium Ammonium Nitrate (CAN)	0.0	4.4	25.0	33.2	19.1	12.7	2.6	2.3	0.0	0.6	0.0	0.0	26
Urea Ammonium Nitrate (UAN)	0.0	8.2	30.3	43.4	14.8	2.1	0.6	0.2	0.3	0.0	0.0	0.0	284
Other Straight N	0.4	8.8	49.6	30.8	3.6	1.0	4.3	0.6	0.4	0.2	0.2	0.0	97
Triple Superphosphate (TSP)	0.0	10.9	20.3	19.7	4.8	0.1	0.9	13.1	7.4	13.0	7.2	2.6	36
Other Straight P	2.0	10.3	3.8	5.5	3.3	0.4	0.4	15.4	42.7	12.9	3.2	0.0	27
Muriate of Potash (MOP)	0.8	20.3	19.0	16.8	5.3	1.4	1.5	1.7	10.9	8.5	13.0	0.8	55
Other Straight K	19.2	27.1	4.8	2.4	1.2	0.1	0.1	2.0	3.0	6.4	21.1	12.5	32
PK	3.4	14.0	10.3	4.5	2.5	0.2	0.1	7.1	22.9	21.5	9.9	3.7	335
NK	1.7	2.8	32.9	10.7	20.2	21.4	5.4	3.1	0.2	0.0	1.6	0.0	77
Low N (<19% N)	0.6	9.5	31.2	25.6	14.8	2.1	1.1	2.3	8.8	2.9	1.0	0.1	167
High N (>=19% N)	0.0	2.7	24.5	32.9	20.7	11.1	4.4	2.8	0.5	0.2	0.1	0.0	495
Other	2.8	3.8	43.0	20.0	10.2	8.4	0.0	6.5	2.8	2.5	0.0	0.0	23
All Fertilisers	**0.7**	**8.1**	**26.1**	**32.1**	**15.1**	**4.7**	**1.9**	**2.2**	**3.9**	**3.1**	**1.7**	**0.6**	**3197**

Source: British Survey of Fertiliser Practice 2008

Table EW4.1a Average fertiliser practice on tillage and grassland by GOR, England & Wales 2008

		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	97	54	57	50	116	38	56	112	21	32	84
	All grass	68	54	56	54	98	21	29	66	11	16	241
	All crops and grass	72	54	56	53	101	23	33	72	13	18	325
North East	All tillage	91	55	58	13	180	53	70	163	29	40	222
	All grass	47	32	33	27	83	26	34	39	8	11	192
	All crops and grass	65	41	43	21	139	41	54	90	17	23	414
Eastern	All tillage	91	43	39	9	157	66	79	143	29	31	822
	All grass	39	13	14	7	86	21	41	34	3	6	101
	All crops and grass	85	40	36	8	153	64	77	130	26	28	923
Yorkshire and the Humber	All tillage	93	45	60	22	165	60	89	152	27	53	846
	All grass	53	29	31	36	110	25	35	59	7	11	279
	All crops and grass	78	39	49	27	151	50	76	118	19	37	1125
West Midlands	All tillage	90	48	58	26	154	58	94	139	28	54	431
	All grass	55	37	38	29	85	21	29	47	8	11	279
	All crops and grass	71	42	47	28	125	40	65	89	17	31	710
East Midlands	All tillage	93	47	50	12	171	62	72	159	29	36	616
	All grass	50	20	20	32	103	22	27	52	4	5	132
	All crops and grass	83	41	43	16	162	58	67	135	24	29	748
South West	All tillage	84	55	56	40	146	55	72	123	30	41	708
	All grass	54	35	36	45	102	24	36	56	8	13	736
	All crops and grass	65	42	43	43	122	38	52	79	16	22	1444
South East	All tillage	89	39	41	18	170	64	79	151	25	32	706
	All grass	39	13	14	17	97	31	44	38	4	6	271
	All crops and grass	71	30	31	18	155	59	74	111	18	23	977
Wales	All tillage	89	61	61	50	102	48	61	91	30	37	127
	All grass	62	54	53	42	89	22	25	55	12	13	426
	All crops and grass	64	55	53	43	91	24	29	58	13	15	553

Source: British Survey of Fertiliser Practice 2008

Table EW4.1b Average fertiliser practice on tillage and grassland by BSFP region, England & Wales 2008

		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	84	49	48	37	157	54	76	132	26	37	364
	All grass	46	21	20	39	88	24	35	40	5	7	302
	All crops and grass	63	34	32	38	129	43	62	81	15	20	666
Anglia	All tillage	91	43	39	9	157	66	79	143	29	31	822
	All grass	39	13	14	7	86	21	41	34	3	6	101
	All crops and grass	85	40	36	8	153	64	77	130	26	28	923
Northern	All tillage	88	56	61	22	155	43	61	137	24	37	215
	All grass	63	50	51	47	91	21	30	58	11	15	332
	All crops and grass	69	51	53	41	111	27	38	77	14	20	547
North East	All tillage	93	46	60	21	167	60	88	156	28	52	929
	All grass	53	31	33	34	108	26	35	57	8	12	368
	All crops and grass	77	40	49	26	150	49	73	115	20	36	1297
North Mercia	All tillage	92	50	66	39	134	56	115	124	28	76	174
	All grass	53	40	41	39	86	21	27	46	8	11	153
	All crops and grass	65	43	49	39	107	33	64	69	14	31	327
South Mercia	All tillage	87	49	53	20	158	60	73	136	29	39	319
	All grass	42	21	23	16	88	20	31	37	4	7	177
	All crops and grass	66	35	39	18	136	49	62	89	17	24	496
East Midland	All tillage	93	47	50	12	171	62	72	159	29	36	616
	All grass	50	20	20	32	103	22	27	52	4	5	132
	All crops and grass	83	41	43	16	162	58	67	135	24	29	748
South East	All tillage	89	39	41	18	170	64	79	151	25	32	706
	All grass	39	13	14	17	97	31	44	38	4	6	271
	All crops and grass	71	30	31	18	155	59	74	111	18	23	977
South West	All tillage	89	63	68	55	129	54	74	115	34	51	290
	All grass	65	49	51	53	110	24	36	71	11	18	395
	All crops and grass	71	52	55	54	115	32	48	81	17	26	685
Wales	All tillage	89	61	61	50	102	48	61	91	30	37	127
	All grass	62	54	53	42	89	22	25	55	12	13	426
	All crops and grass	64	55	53	43	91	24	29	58	13	15	553

Source: British Survey of Fertiliser Practice 2008

Table SC1.1 Total fertiliser use, Scotland 2008

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Winter wheat	99	84	90	7	178	67	94	176	56	84	131
Spring barley	96	94	95	42	93	49	61	90	46	58	301
Winter barley	100	92	97	27	146	64	78	146	59	75	78
Oats	73	63	59	14	81	42	61	59	26	36	37
Potatoes	100	100	100	23	148	149	225	148	149	225	25
Winter oilseed rape	100	85	90	19	172	53	77	172	45	69	39
Other crops	65	67	68	62	78	63	78	50	42	53	107
All tillage	94	88	90	33	118	57	75	111	50	68	718
Grass less than five years old	83	72	72	30	120	36	47	99	26	34	248
Grass five years and over	67	58	57	18	81	23	27	55	13	15	360
All grass	71	61	61	21	93	27	33	66	16	20	608
All crops and grass	79	71	71	26	103	40	52	82	29	37	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.2 Use of straight fertiliser, Scotland 2008

	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	95	0	13	163	0	109	155	0	14	131
Spring barley	50	0	3	64	90	83	32	0	3	301
Winter barley	93	0	4	126	0	58	117	0	2	78
Oats	33	0	4	101	0	144	33	0	6	37
Potatoes	24	0	9	55	0	225	13	0	20	25
Winter oilseed rape	100	0	10	154	0	119	154	0	12	39
Other crops	18	0	5	90	0	186	17	0	9	107
All tillage	60	0	6	108	90	109	65	0	6	718
Grass less than five years old	27	0	0	87	0	120	24	0	0	248
Grass five years and over	16	0	0	81	0	79	13	0	0	360
All grass	19	0	0	83	0	90	15	0	0	608
All crops and grass	33	0	2	99	90	107	33	0	2	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.3 Use of compound fertiliser, Scotland 2008

	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	36	84	82	57	67	85	21	56	70	131
Spring barley	91	94	93	64	48	60	58	45	55	301
Winter barley	56	92	95	52	64	76	29	59	73	78
Oats	54	63	54	48	42	55	26	26	29	37
Potatoes	100	100	91	135	149	225	135	149	206	25
Winter oilseed rape	58	85	90	31	53	64	18	45	57	39
Other crops	57	67	65	59	63	68	34	42	44	107
All tillage	73	88	87	63	57	71	46	50	62	718
Grass less than five years old	70	72	72	108	36	46	75	26	34	248
Grass five years and over	57	58	56	73	23	27	42	13	15	360
All grass	61	61	60	84	27	33	51	16	20	608
All crops and grass	65	71	70	75	40	50	49	29	35	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.4 Use of lime, Scotland 2008

	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	5.1	-	5.4	-	3.5	13.9	4.5	-	4.3	-	0.5	3.5	17	131
Spring barley	8.6	-	10.1	-	3.6	22.4	4.5	-	4.3	-	2.4	4.0	76	301
Winter barley	3.9	-	7.6	-	-	11.5	4.8	-	4.5	-	-	4.7	11	78
Oats	3.6	-	7.5	-	0.8	11.9	4.6	-	5.3	-	0.5	4.2	7	37
Potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	25
Winter oilseed rape	4.8	-	8.0	-	3.9	16.7	3.7	-	5.3	-	0.5	3.7	6	39
Other crops	7.3	-	3.4	-	7.2	17.9	4.4	-	3.3	-	2.2	3.5	23	107
All tillage	6.8	-	8.1	-	3.3	18.2	4.5	-	4.4	-	1.9	3.9	140	718
Grass less than five years old	3.0	-	1.7	-	3.5	8.2	4.5	-	5.0	-	1.9	3.6	15	248
Grass five years and over	0.4	-	1.1	-	1.1	2.6	5.1	-	5.0	-	2.6	4.1	13	360
All grass	1.0	-	1.2	-	1.7	4.0	4.8	-	5.0	-	2.2	3.9	28	608
All crops and grass	3.1	-	3.7	-	2.3	9.1	4.5	-	4.5	-	2.0	3.9	168	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.5 Percentage of crop area by field application rate - Nitrogen, Scotland 2008

	kg/ha																		Fields in
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	sample
Winter wheat	1	0	3	4	5	1	6	18	34	20	5	0	0	3	0	0	1	-	131
Spring barley	4	2	7	12	29	34	11	1	2	-	-	-	-	-	-	-	-	-	301
Winter barley	0	1	4	8	0	13	20	32	15	5	2	0	0	0	1	-	-	-	78
Oats	27	2	22	10	11	17	5	3	0	0	3	-	-	-	-	-	-	-	37
Potatoes	0	0	0	10	15	17	27	0	4	10	3	12	-	-	-	-	-	-	25
Winter oilseed rape	0	0	0	11	2	0	7	23	21	24	10	2	-	-	-	-	-	-	39
Other crops	35	7	14	15	11	8	3	2	3	1	-	-	-	-	-	-	-	-	107
All tillage	6	2	7	10	18	22	10	8	10	5	2	0	0	1	-	-	-	-	718
Grass less than five years old	17	1	9	11	14	9	12	11	5	5	2	2	0	0	1	-	-	-	248
Grass five years and over	33	0	16	26	7	6	5	3	1	1	1	1	-	-	-	-	-	-	360
All grass	29	0	14	22	9	7	7	5	2	2	1	1	-	-	-	-	-	-	608
All crops and grass	21	1	12	18	12	12	8	6	5	3	1	1	-	-	-	-	-	-	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.6 Percentage of crop area by field application rate - Phosphate, Scotland 2008

	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	16	6	9	38	28	3	0	1	-	-	-	-	-	-	-	-	-	-	131
Spring barley	6	10	32	46	6	1	-	-	-	-	-	-	-	-	-	-	-	-	301
Winter barley	8	11	9	32	37	1	0	1	-	-	-	-	-	-	-	-	-	-	78
Oats	37	8	40	10	5	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Potatoes	0	7	0	3	10	11	21	9	22	11	0	6	-	-	-	-	-	-	25
Winter oilseed rape	15	16	16	40	10	2	-	-	-	-	-	-	-	-	-	-	-	-	39
Other crops	33	7	23	17	6	7	3	4	-	-	-	-	-	-	-	-	-	-	107
All tillage	12	9	24	38	13	2	1	1	1	-	-	-	-	-	-	-	-	-	718
Grass less than five years old	28	21	33	13	5	-	-	-	-	-	-	-	-	-	-	-	-	-	248
Grass five years and over	42	34	19	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	360
All grass	39	31	23	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	608
All crops and grass	29	23	23	17	6	1	-	-	-	-	-	-	-	-	-	-	-	-	1326

Source: British Survey of Fertiliser Practice 2008

Table SC1.7 Percentage of crop area by field application rate - Potash, Scotland 2008

	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	6	5	10	30	25	6	7	0	0	0	1	-	-	-	-	-	-	131
Spring barley	5	8	19	41	17	6	3	-	-	-	-	-	-	-	-	-	-	-	301
Winter barley	3	11	4	17	39	25	0	1	-	-	-	-	-	-	-	-	-	-	78
Oats	41	8	9	28	8	3	0	4	-	-	-	-	-	-	-	-	-	-	37
Potatoes	0	7	0	0	8	6	3	11	0	22	0	3	13	10	0	3	12	-	25
Winter oilseed rape	10	14	6	29	18	13	0	7	3	-	-	-	-	-	-	-	-	-	39
Other crops	32	7	20	14	13	6	0	4	2	0	0	1	0	1	0	0	0	1	107
All tillage	10	8	14	29	20	11	3	2	0	1	-	-	-	-	-	-	-	-	718
Grass less than five years old	28	17	28	14	11	2	1	-	-	-	-	-	-	-	-	-	-	-	248
Grass five years and over	43	30	19	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	360
All grass	39	27	21	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	608
All crops and grass	29	20	19	15	9	5	1	1	-	-	-	-	-	-	-	-	-	-	1326

Source: British Survey of Fertiliser Practice 2008

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2008

	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	62	52	51	10	69	20	21	43	10	11	327
Grazed mown	93	83	83	48	130	32	47	121	27	40	160
All grazings	68	58	57	18	84	23	29	58	13	16	487
Cut for silage - grazed	94	84	84	51	133	32	48	125	27	41	138
Cut for silage - not grazed	96	89	90	55	142	45	56	136	40	51	98
All cut for silage	95	86	86	52	137	38	52	129	32	45	236
Cut for hay - grazed	77	75	75	25	79	23	29	61	17	22	26
Cut for hay - not grazed	80	72	69	7	97	35	40	78	25	28	25
All cut for hay	79	74	72	16	88	28	34	69	21	25	51
All mowings	93	85	86	49	133	37	51	124	32	43	281
All grass	71	61	61	21	93	27	33	66	16	20	608

Source: British Survey of Fertiliser Practice 2008

Table SC2.2 Percentage of grass area by field application rate - Nitrogen, Scotland 2008

	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	38	1	18	26	5	5	4	2	1	-	-	-	-	-	-	-	-	-	327
Grazed mown	7	0	5	13	12	14	18	12	8	7	1	1	0	2	1	-	-	-	160
All grazings	32	1	16	24	7	6	6	4	2	2	-	-	-	-	-	-	-	-	487
Cut for silage - grazed	6	0	3	13	12	14	19	12	8	8	1	1	0	2	1	-	-	-	138
Cut for silage - not grazed	4	0	1	10	23	11	14	10	4	7	7	6	2	0	1	-	-	-	98
All cut for silage	5	0	2	12	17	13	17	12	7	8	3	3	1	1	1	-	-	-	236
Cut for hay - grazed	23	0	19	13	20	13	6	4	2	-	-	-	-	-	-	-	-	-	26
Cut for hay - not grazed	20	0	11	21	19	6	2	16	0	0	5	-	-	-	-	-	-	-	25
All cut for hay	21	0	15	17	20	10	4	10	1	0	2	-	-	-	-	-	-	-	51
All mowings	7	0	4	12	16	12	16	12	6	7	3	3	1	1	1	-	-	-	281
All grass	29	0	14	22	9	7	7	5	2	2	1	1	-	-	-	-	-	-	608

Source: British Survey of Fertiliser Practice 2008

Table SC2.3 Percentage of grass area by field application rate - Phosphate, Scotland 2008

	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	48	34	17	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	327
Grazed mown	17	29	37	15	2	-	-	-	-	-	-	-	-	-	-	-	-	-	160
All grazings	42	33	21	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	487
Cut for silage - grazed	16	28	38	16	2	-	-	-	-	-	-	-	-	-	-	-	-	-	138
Cut for silage - not grazed	11	15	36	25	10	2	-	-	-	-	-	-	-	-	-	-	-	-	98
All cut for silage	14	23	37	20	6	1	-	-	-	-	-	-	-	-	-	-	-	-	236
Cut for hay - grazed	25	48	22	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Cut for hay - not grazed	28	28	31	8	0	5	-	-	-	-	-	-	-	-	-	-	-	-	25
All cut for hay	26	38	26	7	0	2	-	-	-	-	-	-	-	-	-	-	-	-	51
All mowings	15	24	37	18	5	1	-	-	-	-	-	-	-	-	-	-	-	-	281
All grass	39	31	23	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	608

Source: British Survey of Fertiliser Practice 2008

Table SC2.4 Percentage of grass area by field application rate - Potash, Scotland 2008

	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	19	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	327
Grazed mown	17	21	28	18	11	3	2	-	-	-	-	-	-	-	-	-	-	-	160
All grazings	43	29	20	5	2	1	-	-	-	-	-	-	-	-	-	-	-	-	487
Cut for silage - grazed	16	21	28	19	11	4	2	-	-	-	-	-	-	-	-	-	-	-	138
Cut for silage - not grazed	10	14	28	24	13	6	2	2	-	-	-	-	-	-	-	-	-	-	98
All cut for silage	14	18	28	21	12	5	2	1	-	-	-	-	-	-	-	-	-	-	236
Cut for hay - grazed	25	41	20	5	9	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Cut for hay - not grazed	31	17	29	22	0	0	0	1	-	-	-	-	-	-	-	-	-	-	25
All cut for hay	28	29	25	13	5	-	-	-	-	-	-	-	-	-	-	-	-	-	51
All mowings	14	18	29	20	11	4	2	1	-	-	-	-	-	-	-	-	-	-	281
All grass	39	27	21	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	608

Source: British Survey of Fertiliser Practice 2008

Table SC3.0 Product use by month of application, Scotland 2008

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total product ('000 tonnes)
Straight N	0	0	1	0	0	4	17	40	25	7	4	1	156
Straight P	0	0	0	0	0	0	0	100	0	0	0	0	0
Straight K	0	0	0	0	0	14	23	29	15	1	0	0	6
Compounds	3	4	0	0	0	1	14	49	15	7	4	2	402
All fertilisers	2	3	0	0	0	2	15	46	18	7	4	1	565

(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	15	48	20	8	5	1	123
Phosphate	6	7	0	1	0	3	13	48	12	4	3	2	43
Potash	5	7	0	1	0	3	14	46	12	5	3	2	56
Total	2	3	0	0	0	2	14	47	16	6	4	2	221

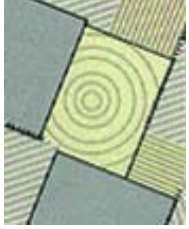
Note: All fertilisers includes other straight fertilisers (e.g. sulphur or trace elements)

'Product' refers to the total tonnage of the products used by the farmers in the survey year 2008.

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

(e.g. 100 kg of a 20 : 20 : 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 2008



SECTION D

USE OF ORGANIC MANURES – GREAT BRITAIN, 2008

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 1327 farms in the survey, around two thirds (907) 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, 2008

	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	420	708	256	38	15	29	42	52	7	41	22
Farms in population	27424	48806	15740	2239	680	1709	2607	4348	457	1659	1278
Farms in population %	31%	55%	18%	3%	1%	2%	3%	5%	1%	2%	1%
Volume ('000,000 t; m^3)	n/a	31.7	34.7	1.8	1.0	0.7	1.0	1.3	0.7	2.5	2.0
Volume %	n/a	41%	45%	2%	1%	1%	1%	2%	1%	3%	3%

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, 2004 - 2008

	none	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other*
2004	28	60	18	2	1	2	2	5	4
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

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 2004, whereas the use of cattle slurry has remained more consistent, and is at 18% of farms in 2008. 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.

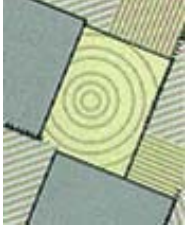


Table D1.2a Estimated volume of exported manures, Great Britain 2008

	cattle FYM	*cattle slurry*	*pig FYM*	*layer manure*	*broiler/ turkey litter*	*other*	*total*
Farms in sample	19	7	2	3	1	0	30
Farms in population	1498	452	-	-	-	-	2579
Exported volume ('000,000 t; m^3)	0.5	0.1	-	-	-	-	0.7
Average volume per farm (t;m^3)	340	264	-	-	-	-	284

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 2004 - 2008

	cattle FYM	*cattle slurry*	*other*	*farms in population*
2004	1.1	0.4	0.5	108140
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

The percentage of farms exporting cattle manures is reasonably consistent over the five year period 2004 – 2008. Exports of other types of manures have increased over the same period, although this remains at a low level at just 1% of farms.

Of the farms surveyed, 907 reported use of either farm or non-farm manure and, of these, 170 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 2008

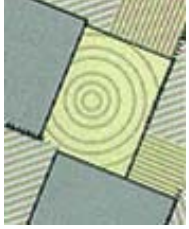
	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer manure*	*broiler/ turkey litter*	*other FYM*	*other farm manure*	*total*
Farms in sample	32	6	10	6	23	33	8	1	106
Farms in population	2502	372	439	213	1291	1756	360	-	6624
Imported volume ('000,000 t; m^3)	0.7	0.1	0.4	0.2	0.2	0.6	0.1	-	2.3
Average volume per farm (t; m^3)	283	273	876	948	178	326	199	-	348

Table D1.3b Number of farms importing non-farm manures (solids and liquids), showing quantity imported, Great Britain 2008

	bio-solids	*other non-farm manure*	*total*
Farms in sample	42	24	64
Farms in population	1668	1211	2803
Imported volume ('000,000 t; m^3)	1.5	3.9	5.4
Average volume per farm (t; m^3)	898	3255	1941

Note: some farmers imported more than one type of manure

The amount of imported non-farm manures has increased each year since 2003 to 5.4 million tonnes in 2008. This is attributable to both an increase in usage per farm (1941 tonnes;m^3 compared with 1070



tonnes;m^3 in 2003) and to a substantial increase in the number of farms importing (64 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 2004 - 2008

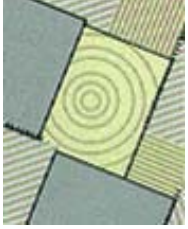
	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer/hen manure*	*broiler/ turkey litter*	*other FYM*	*other*	*farms in population*
2004	1.3	0.5	0.4	0.2	0.4	1.8	0.0	2.4	108140
2005	1.9	0.1	0.4	0.1	1.1	1.9	0.1	2.7	90787
2006	2.1	0.1	0.4	0.0	0.8	2.1	0.3	3.3	90549
2007	2.6	0.6	0.5	0.4	1.1	1.7	0.1	3.2	91361
2008	2.8	0.4	0.5	0.2	1.4	2.0	0.4	3.3	89241

The percentage of farms importing cattle FYM and other manures have gradually increased since 2004 to just under 2.8% and 3.3% of farms respectively in 2008. Other types of manure are imported to a lesser degree and show greater fluctuations across 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 across all farm robust types for both types of slurry.

Table D1.4 Number and percentage (%) of farms using each type of application method by slurry type and robust farm type, Great Britain 2008

			percentage of farms					
robust farm type	*farms in sample*	*farms in population*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating boom*
Cattle slurry								
Cereals	4	222	-	-	-	-	-	-
General cropping	6	217	70	25	25	0	0	0
Dairy	139	9017	90	8	7	2	2	2
Other livestock	78	4954	89	9	2	0	1	0
Pigs and poultry	1	52	-	-	-	-	-	-
Mixed	28	1278	84	6	2	0	4	0
TOTAL	256	15740	89	8	5	1	2	1
Pig slurry								
Cereals	4	112	-	-	-	-	-	-
General cropping	3	97	-	-	-	-	-	-
Dairy	1	103	-	-	-	-	-	-
Other livestock	2	218	-	-	-	-	-	-
Pigs and poultry	1	24	-	-	-	-	-	-
Mixed	4	126	-	-	-	-	-	-
TOTAL	15	680	96	0	0	0	0	4
Both	2	218	-	-	-	-	-	-
Grand Total	269	16202	89	8	5	1	2	2



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 94% of the area with 78% of it incorporated within a week of spreading on tillage fields. Cattle slurry is less likely to be incorporated at 85% of the volume and this incorporation tends to be later than for FYM, with 23% 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 2008

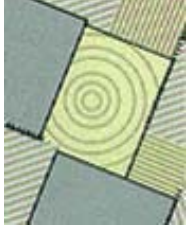
	incorporation time after spreading										*total*	
	not incorporated		*within 6 hours*		*between 6 and 24 hours*		*between 1 and 7 days*		*more than 1 week*		*applied area*	*volume applied*
	%area	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*%area*	*%vol*	*'000 ha*	*'000,000t;m^3*
FYM	6	7	6	6	20	19	52	53	15	16	652	16.2
Cattle slurry	22	15	4	3	21	26	29	34	23	23	117	3.7
Pig slurry	12	7	6	3	6	5	48	45	28	39	24	0.5
Poultry FYM	13	18	16	12	40	35	28	33	3	2	159	1.6
Other	3	0	23	22	38	30	36	48	0	0	127	4.0

Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor (Table D1.6). Farmers with pig slurry were the least likely to use a contractor to apply at least some of their manure at 10% of farms, with other main manure and slurry types sitting between 26-33% of farms using a contractor. Where contractors were used they were applying between 84 and 100% of the manure.

Table D1.6 Use of contractors to spread manure/slurry in current season, Great Britain 2008

	% of farms using a contractor	*% volume applied by contractor*	*average % of contractor-applied manure, where contractor is used*
FYM	27	23	90
Cattle slurry	33	24	84
Pig slurry	10	7	100
Poultry manure	26	32	100
Other	65	71	98

Note: care should be taken with slurry figures here as the bases are small.



D2 USE OF ORGANIC MANURES

The proportion of fields receiving each of the main types of manure is shown in Table D2.1a, with cattle FYM and cattle slurry being the most commonly applied manures.

Table D2.1a Percentage of fields receiving each organic manure type, Great Britain 2008

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*other FYM*	*other farm manure*	*bio-solids*	*other non-farm*	*total*
% of all fields	20	9	1	0	1	1	1	0	1	1	32
% of all fields where organic manure is applied	62	26	4	1	2	4	4	1	3	2	100

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

Table D2.1b Percentage of all fields receiving each organic manure type, Great Britain 2004 - 2008

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
2004	23	9	1	1	0	1	1	1
2005	21	9	0	0	1	1	1	1
2006	23	9	0	1	1	1	1	1
2007	20	9	0	0	1	1	0	1
2008	20	9	1	0	1	1	1	2

Table D2.1c Percentage of all fields where organic manure is applied receiving each organic manure type, Great Britain 2004 - 2008

	cattle FYM	*cattle slurry*	*pig FYM*	*pig slurry*	*layer hen manure*	*broiler/ turkey litter*	*other FYM*	*other*
2004	72	27	2	2	1	2	4	3
2005	69	28	1	1	2	4	4	5
2006	70	28	1	2	2	2	3	5
2007	68	32	2	1	2	2	2	3
2008	62	26	4	1	2	4	4	5

The percentage of all fields receiving an application of cattle FYM has declined slightly since 2004 to 20%. Looking across all fields where an organic manure has been applied the trend for cattle manure and slurries is for declining applications, and increased applications for pig FYM, broiler and turkey litter and other manure types (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.

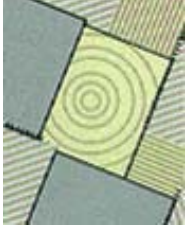


Table D2.2 Typical dry matter and nutrient content of different organic manure types[11]

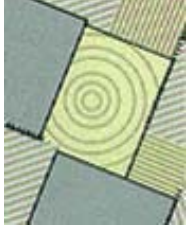
	dry matter (%)	*total N (kg/t; kg/m^3)*	*total P_2O_5 (kg/t; kg/m^3)*	*total K_2O (kg/t; kg/m^3)*
Cattle FYM	25	6.0	3.5	8.0
Pig FYM	25	7.0	7.0	5.0
Sheep FYM	25	6.0	2.0	3.0
Duck manure	25	6.5	5.5	7.5
Layer hen manure	30	16.0	13.0	9.0
Broiler/turkey litter	60	30.0	25.0	18.0
Cattle slurry	6	2.7	1.2	3.1
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

Using these typical values it is possible to estimate the average application rate for nitrogen on fields receiving manures. In Table D2.3, crops receiving manure applications have been classified as either "winter sown", "spring sown" or "grass" (details given in Table D2.5) and their average application of nitrogen calculated accordingly.

Table D2.3 Estimated average rates of total nitrogen from organic manure applications to winter sown and spring sown crops and grassland by manure type, Great Britain 2008

	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 %	7.4	1.0	1.1	0.4	1.0	2.4	0.6	-	1.9	1.2
Avg manure rate (t; m^3/ha)	25	30	19	20	12	8	20	-	28	39
Volume ('000,000 t ; m^3)	5.7	0.9	0.7	0.2	0.4	0.6	0.3	-	1.6	1.4
Fields in sample	312	39	41	19	31	50	23	4	62	26
Spring sown										
Treated area %	23.1	2.2	1.8	0.9	0.8	2.0	-	-	1.3	0.6
Avg manure rate (t; m^3/ha)	23	19	33	21	5	8	-	-	21	41
Volume ('000,000 t ; m^3)	4.8	0.4	0.5	0.2	0.0	0.1	-	-	0.3	0.2
Fields in sample	277	35	28	12	11	21	4	1	11	11
Grass										
Treated area %	23.2	24.3	0.5	0.7	0.4	0.6	2.1	0.5	0.6	0.3
Avg manure rate (t; m^3/ha)	15	26	12	12	4	5	8	32	13	8
Volume ('000,000 t ; m^3)	17.2	31.0	0.3	0.4	0.1	0.1	0.8	0.7	0.4	0.1
Fields in sample	598	538	19	17	9	22	47	12	19	6

[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.

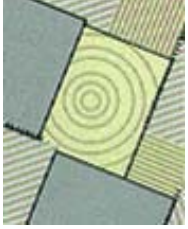
The time of year when manure was applied is shown in Table D2.4. as a proportion of fields receiving manure applications. Once again the crops have been classified as either "winter sown", "spring sown" or "grass". This segmentation highlights the prevalence of applications in August and September for 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 2008

	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	20	23	53	26	35	44	37	-	31	25
September	61	41	33	19	59	30	58	-	53	60
October	11	5	4	8	2	2	5	-	13	15
Winter (Nov, Dec, Jan)	2	10	0	3	0	0	0	-	3	0
Spring (Feb, Mar, Apr)	3	15	1	15	2	24	0	-	0	0
Summer (May, Jun, Jul)	2	6	8	29	2	0	0	-	0	0
Spring sown										
August	0	0	0	0	6	0	-	-	9	0
September	2	1	3	0	0	0	-	-	3	0
October	5	0	24	5	11	0	-	-	23	0
Winter (Nov, Dec, Jan)	26	24	28	32	40	23	-	-	58	0
Spring (Feb, Mar, Apr)	66	75	44	63	43	77	-	-	7	100
Summer (May, Jun, Jul)	1	0	0	0	0	0	-	-	0	0
Grass										
August	9	5	2	2	8	6	11	30	0	0
September	5	1	6	0	0	0	5	45	14	18
October	8	4	0	2	0	14	17	0	40	0
Winter (Nov, Dec, Jan)	22	18	34	9	0	8	13	1	0	0
Spring (Feb, Mar, Apr)	39	47	45	51	85	68	29	17	39	71
Summer (May, Jun, Jul)	16	24	13	37	7	4	26	7	7	11

Table D2.5 Classification of "winter sown", "spring sown" and "grass" crops

crop group	*crops included*				
Winter sown	Rye/triticale (for grain)	Winter barley	Winter oats	Winter oilseed rape	Winter wheat
Spring sown	Beans for human consumption (broad, french, runner etc.)			Beetroot	Broccoli
	Cabbage				
	Calabrese/broccoli	Carrots	Cauliflower	Courgette/marrows	Peas
	Flax	Forage maize	Leeks	Lettuce	Linseed
	Mangolds/fodderbeet				
	Onions	Other outdoor vegetables		Parsnips	Potatoes
	Spring barley	Spring oats			
	Spring oilseed rape	Spring wheat	Sugar beet	Swedes/turnips	Sweetcorn
Grass	Grass five years and over	Grass less than five years old			



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 overall fertiliser rates for the main tillage crops in Great Britain, with and without manure inputs.

Table D3.1a Overall field rate of manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2008

	nitrogen		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	161	183	17	30	31	37	356	1596
Spring barley	88	101	39	33	48	48	252	460
Winter barley	122	137	25	37	41	53	120	489
Potatoes (maincrop)	154	156	140	127	260	227	39	57
Sugar beet	80	89	15	39	84	93	46	88
Spring oilseed rape *	161	108	0	55	48	65	1	17
Winter oilseed rape	159	197	14	31	25	36	68	495
Peas - animal consumption *	0	1	20	23	75	34	2	37
Beans - animal consumption *	2	1	9	24	29	25	16	140
Forage maize	44	48	34	31	29	67	172	20

* Note: small number of fields receiving manures

For all the major tillage crops, except spring oilseed rape, 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 in nitrogen ranged from 1% for potatoes through to 24% for winter oilseed rape. This is also predominantly the case for phosphate and potash fertiliser application rates. This was most dramatically illustrated by a 62% decrease in the rate of phosphate on manured sugar beet fields. Maincrop potatoes showed a reduction in the overall rates of phosphate and potash on un-manured land, although the number of fields in the sample is quite low. 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.

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

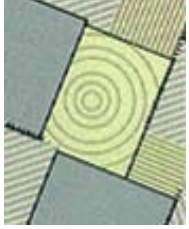


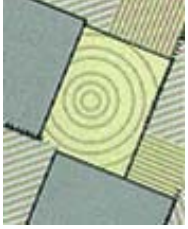
Table D3.1b Overall field rate from manufactured fertiliser application to tillage crops in Great Britain, with and without applications of organic manure, 2004 - 2008

nitrogen	*2004*		*2005*		*2006*		*2007*		*2008*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	191	199	177	199	167	197	168	194	161	183
Spring barley	93	109	87	112	102	101	94	103	88	101
Winter barley	133	147	120	150	114	141	108	141	122	137
Potatoes (maincrop)	172	149	148	186	136	152	109	144	154	156
Sugar beet	98	95	88	101	83	109	79	99	80	89
Winter oilseed rape	177	215	180	209	181	193	181	191	159	197
Forage maize	46	93	58	89	52	58	51	61	44	48

phosphate	*2004*		*2005*		*2006*		*2007*		*2008*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	30	40	31	38	19	37	21	33	17	30
Spring barley	46	44	38	42	49	33	41	36	39	33
Winter barley	50	45	42	43	35	38	34	36	25	37
Potatoes (maincrop)	125	128	116	188	90	156	91	151	140	127
Sugar beet	22	41	23	46	19	45	11	50	15	39
Winter oilseed rape	23	41	27	44	25	35	19	32	14	31
Forage maize	39	56	42	64	43	20	40	28	34	31

potash	*2004*		*2005*		*2006*		*2007*		*2008*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
Winter wheat	49	48	44	44	37	42	36	40	31	37
Spring barley	53	59	48	55	60	61	51	49	48	48
Winter barley	65	62	54	58	51	54	46	62	41	53
Potatoes (maincrop)	243	188	204	306	174	225	141	230	260	227
Sugar beet	94	108	77	135	76	128	81	110	84	93
Winter oilseed rape	34	48	31	44	37	37	39	37	25	36
Forage maize	42	72	62	128	38	84	33	25	29	67

Differences in field rates with and without manures for nitrogen, phosphate and potash for the period 2004 to 2008 are shown in table D3.1b above. The trend for higher rates on unmanured fields holds true for nitrogen and phosphate on winter wheat throughout the period. The increased rates are most consistent for nitrogen on winter wheat at between 4% and 18% increase over manured fields. Winter oilseed rape application rates for all three nutrients were consistently higher on unmanured crops over the five year period. Other crops show greater variability between manured and unmanured field rates for the different nutrients across the five year period 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 2008

	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 *	100	112	32	37	41	56	20	119
Grass 5 years and over *	61	72	29	27	58	34	19	351
All grass	86	84	31	31	44	43	39	470
Dairy								
Grass under 5 years old	166	118	33	26	59	34	144	45
Grass 5 years and over	133	128	26	26	39	33	257	167
All grass	143	126	28	26	45	33	401	212
General cropping								
Grass under 5 years old *	109	114	22	40	37	50	22	70
Grass 5 years and over *	71	71	17	24	18	29	12	163
All grass	90	86	19	31	26	38	34	233
Mixed								
Grass under 5 years old	168	101	48	28	92	36	48	116
Grass 5 years and over	88	80	26	25	34	31	40	230
All grass	130	87	36	26	62	32	88	346
Other livestock								
Grass under 5 years old	96	94	31	25	37	35	128	140
Grass 5 years and over	71	61	20	17	23	19	357	532
All grass	75	66	22	19	26	22	485	672
All farm types								
Grass under 5 years old	141	104	33	29	53	40	363	493
Grass 5 years and over	101	77	23	21	31	24	685	1447
All grass	112	83	25	23	36	28	1048	1940

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).

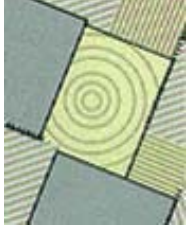


Table D3.3a Average fertiliser application rate on dairy grassland with and without applications of organic manure, Great Britain 2008

	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	75	74	18	26	18	32	144	352
All cut for silage	126	110	29	30	45	43	631	476
All grazings	108	81	24	22	34	26	945	1742

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 2004 – 2008

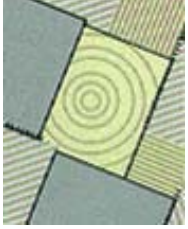
all cut for hay	*nitrogen*		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2004	117	116	29	54	44	66	44	22
2005	89	120	24	54	37	45	33	15
2006	86	84	30	21	41	24	42	15
2007	85	78	31	29	36	37	131	347
2008	75	74	18	26	18	32	144	352

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*
2004	163	187	30	54	60	77	301	68
2005	165	148	33	30	57	51	225	75
2006	139	118	30	26	50	38	246	55
2007	133	120	31	33	48	49	657	542
2008	126	110	29	30	45	43	631	476

all grazings	*nitrogen*		*phosphate*		*potash*		*fields in sample*	
	with manure	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*	*with manure*	*without manure*
2004	152	163	29	32	47	42	457	221
2005	153	157	30	29	47	38	330	175
2006	136	129	28	25	43	27	383	169
2007	117	83	26	25	37	30	1028	1810
2008	108	81	24	22	34	26	945	1742

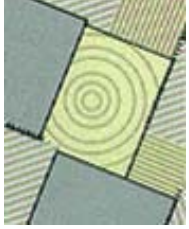
Note: Figures for 2004-2006 are for England & Wales, figures for 2007 onwards are for Great Britain

Mineral fertiliser application rates of nitrogen on grass cut for hay have in general declined over the 5 year period 2004-2008. For phosphate and potash significant reductions were not seen until this year and these were most marked in fields receiving manure. There is a similar pattern of reducing nitrogen and potash on grass cut for silage since 2004. 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.

Thirty six percent of farmers check the accuracy of mineral fertiliser spreaders by using catch trays on an annual basis (Table D4.1). This is a substantial drop from 45% of farmers in 2006 and a marked change in the trend of an increasing tendency to check over the last few years (32% in 2004 and 41% in 2005.) Six percent of farmers check at each change of fertiliser type.

Table D4.1 Frequency of spread pattern checks using a catch tray, Great Britain 2008

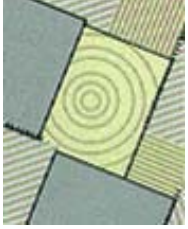
response	*percentage of farms*
Not answered	3
No spreader	8
It is factory set & doesn't need checking	8
At each change of fertiliser type	6
Less than once a year	11
Once a year	36
Never checked	23

Farm diaries continue to be the most common method for recording both fertiliser and manure use (Table D4.2). No fertiliser records were kept on 5% of farms; this compares with 8% in 2007, 7% in 2006, 10% in 2005, 18% in 2004 and 22% in 2001 when this question was previously asked in the survey. Use of computers for record keeping of manufactured fertilisers increased by 3% since last year to 18% of farms in 2008.

Table D4.2 Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2007/08 crop year in Great Britain 2008

	manufactured fertilisers		*organic manures*	
	farms	*farms %*	*farms*	*farms %*
No answer	303	0.4	13796	22.3
Computer program	13185	17.6	4919	8.0
Farm diary	30818	41.2	20221	32.7
Farm notebook/pocketbook	21498	28.7	11633	18.8
File record sheet (file in the office)	20941	28.0	10398	16.8
Other paper record	304	0.4	199	0.3
No records kept	3865	5.2	5956	9.6

Note: more than one method may be used



APPENDIX 1 - SURVEY STATISTICS

APP 1.1 SAMPLING VARIATION

Table App 1.1 Standard errors of application rates for the major crops in 2008

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	2.4	2.8	1.4	1.2	1.7	2.2	2.3	4.6	1.3	1.7	1971
oilseed rape	2.5	2.8	1.4	1.8	2.2	2.4	2.5	4.4	1.9	2.4	582
winter barley	2.3	2.9	1.8	1.6	2.2	2.2	2.2	4.1	1.6	2.0	611
spring barley	1.9	2.5	1.7	1.3	1.7	1.6	2.1	1.8	1.3	1.8	735
m/c potatoes	8.2	7.5	8.9	8.7	13.4	7.9	12.0	8.2	7.9	12.7	98
sugar beet	3.9	4.2	2.4	4.2	7.1	3.4	3.6	6.3	5.7	7.1	135
all tillage crops	2.1	2.4	1.1	0.9	1.3	1.9	2.0	1.8	1.1	1.7	5121
all grass	1.9	1.5	1.3	0.4	0.6	2.0	2.5	1.9	0.7	1.3	3265

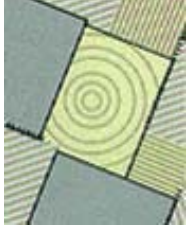
England & Wales

	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	2.5	2.9	1.5	1.3	1.7	2.3	2.5	5.4	1.4	1.8	1840
oilseed rape	2.6	3.0	1.5	1.8	2.2	2.5	2.5	5.3	2.1	2.5	542
winter barley	2.4	3.1	1.9	1.7	2.4	2.3	2.4	5.2	1.6	2.2	533
spring barley	2.5	3.1	1.9	1.5	2.1	2.1	2.3	2.8	2.0	2.5	434
m/c potatoes	9.7	9.0	10.3	10.3	15.6	9.2	12.9	9.6	9.4	14.6	81
sugar beet	3.9	4.2	2.4	4.2	7.1	3.4	3.6	6.3	5.7	7.1	135
all tillage crops	2.3	2.7	1.2	1.0	1.4	2.1	2.2	2.5	1.3	2.0	4410
all grass	2.1	1.8	1.3	0.4	0.7	2.5	2.8	2.3	0.9	1.7	2657

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	7.4	8.6	5.0	4.1	5.1	7.0	7.1	8.1	3.5	4.6	131
oilseed rape	8.4	8.0	3.7	5.1	7.7	8.4	8.0	3.9	4.5	7.4	40
winter barley	7.3	7.9	4.2	4.5	4.9	7.3	6.8	4.7	4.0	4.6	78
spring barley	2.8	3.1	2.6	1.8	2.6	2.6	3.1	2.4	1.7	2.5	301
m/c potatoes	14.2	4.6	16.2	14.5	25.7	14.2	5.2	16.2	14.5	25.7	17
all tillage crops	3.7	4.1	2.4	1.8	2.5	3.5	4.7	2.3	1.7	2.5	711
all grass	3.7	2.5	3.3	1.1	1.4	3.4	5.0	3.3	1.1	1.8	608

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.

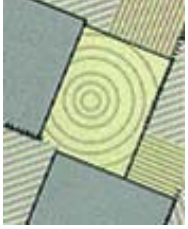
Table App 1.2 Response to main and reserve samples in 2008

	2008	*% total*
Target sample	1500	100
2007 panellists agreeing to re-contact in 2008	1221	81
Achieved 'Main' sample from 2007 panel	983	66
Achieved additional 'Main' sample	137	9
Achieved '1st reserve' sample	98	7
Achieved '2nd reserve' sample	67	4
Achieved '3rd reserve' sample	42	3
Total achieved	**1327**	**88**
Total number of refusals/non-contact	1436	
Total number of farms approached	***2763***	

Table App 1.3 Response to main and reserve samples for 2004 - 2008

Net response rate	*2004 %*	*2005 %*	*2006 %*	*2007 %*	*2008 %*
Overall achieved rate	84	89	88	89	88
Achieved % of total contact attempts	55	59	46	51	48
Main sample	87	85	85	72	84
Reserve sample(s)	13	15	15	28	16
Main reason for refusal	*2004 %*	*2005 %*	*2006 %*	*2007 %*	*2008 %*
Too busy	23	35	30	15	18
Not interested	7	13	10	10	9
Do not do surveys	4	6	8	4	3
Want payment	1	2	2	1	0
Too much paperwork	1	3	2	1	0
Other [a]	64	41	48	59	69

[a] includes non-contact and late submission



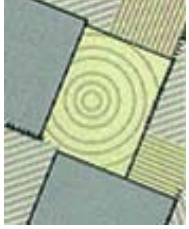
APPENDIX 2

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