THE BRITISH SURVEY OF

Fertiliser Practice

FERTILISER USE ON FARM CROPS FOR CROP YEAR 2004

defra
Department for Environment
Food and Rural Affairs

SCOTTISH EXECUTIVE
Environment and Rural Affairs Department

First published 2005

British Library Cataloguing in Publication Data.

A catalogue record for this book is available from the British Library.

ISBN 0 9552569 0 9

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

Nicola Leeds

Nutrient Management Unit, Livestock Strategy Division

Area 5c, 9 Millbank House

c/o Nobel House

17 Smith Square

London SW1P 3JR

Tel: +44 (0) 20 7238 5586

Fax: +44 (0) 20 7238 3082

FOREWORD

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

The 2004 Survey was sponsored by the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Executive Environment and Rural Affairs Department (SEERAD). 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 2004, the Survey was co-ordinated by Kynetec Ltd., which was responsible for the survey design, statistical analysis and quality control monitoring.

May 2005

ACKNOWLEDGEMENTS

The sponsors gratefully acknowledge the co-operation of all farmers taking part in the 2004 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).

Gillian Goodlass[1]

Will Welch[2]

[1] ADAS High Mowthorpe, Duggleby, Malton, North Yorkshire YO17 8BP

[2] Kynetec Limited, Weston Court, Weston, Newbury, Berkshire RG20 8JE

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 2004 approximately 1,300 farms were surveyed. 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. Aggregated data have been obtained for Great Britain since 1983, the first year that the existing survey in England & Wales was extended to Scotland.

The main findings from the 2004 Survey on the use of each fertiliser nutrient in Great Britain are summarised below. Weather and economic factors which may have contributed to recorded changes in fertiliser use during the 2003/2004 cropping season are also discussed in the report.

Nitrogen

- The total nitrogen use on all crops and grassland declined slightly to 110 kg/ha in 2004 from 113 kg/ha in 2003. This decline is associated with a drop in the overall application rate of both straight and compound nitrogen applied to grassland. Conversely, on tillage land, the use of straight nitrogen has actually increased slightly whilst levels of compound N have remained comparable.
- On arable crops the overall total nitrogen use (152 kg/ha) increased slightly from the 2003 level to match the 2002 level which was the highest in the 5 year period. Over recent years changes in cropping areas (notably in 2001 and to a lesser extent in 2003), rather than application rates to individual crops, have been the major factor influencing the pattern of nitrogen use on the all tillage crops category. Overall rates of total nitrogen decreased on both winter and spring barley as well as sugar beet in 2004, although it remained constant for winter wheat and increased on maincrop/second early potatoes and oilseed rape.
- Overall total nitrogen use on grassland continued to show a decline with a drop of 6 kg/ha from the previous year. This was due to a decrease in the use of both compound N (-3 kg/ha) and straight nitrogen (-4 kg/ha). The area receiving nitrogen remained unchanged. The total nitrogen rate (77 kg/ha) was the lowest reported for both the last five years (mean: 88 kg/ha) and also for the whole survey period since 1983. This may be related to the continuing decline in dairy cow numbers in Great Britain

Phosphate

- Overall phosphate use on tillage crops in 2004 was very similar at 41 kg/ha to the previous year which, at 40 kg/ha, was the lowest rate for the period. Phosphate use on grassland decreased very slightly (-1 kg/ha) compared with the previous year to 17 kg/ha and represents the lowest rate for the period. Over the last five years phosphate use on all crops and grassland has dropped by 4 kg/ha, from 32 to 28 kg/ha. The area of tillage crops and grassland receiving phosphate fertiliser was similar to previous years (and the same as the five year mean) at 65% and 59% respectively.

Potash

- Potash use on tillage crops increased slightly (+1 kg/ha) to 55 kg/ha in 2004. The overall rate of potash on grassland remained at the same low level for the period at 22 kg/ha. Over the last five years, potash use on all crops and grassland has dropped by 3 kg/ha, to 37 kg/ha. The area of tillage crops receiving potash fertiliser was similar to previous years at 67% (five year mean: 66%), whilst for grassland the area receiving potash fertiliser increased slightly to 58% (five year mean: 58%).

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. Since then, however, dressing covers for sulphur generally remained fairly static until 2002 when the areas increased. There have been further increases since then with over half the oilseed rape crop now being treated.

- Despite an underlying upward trend in average application rates over the last 5 years, the cereal levels in 2004 have plateaued or declined compared with 2003. The rate for oilseed rape is the highest ever recorded at 85 kg/ha. The rates applied are generally higher than the recommended practice of 25-40 kg/ha SO_3, applied as a water soluble form in early spring, for potentially sulphur-deficient cereal crops and 50-75 kg/ha for oilseed rape.

Longer term trends

The longer term trends in application rates since 1983 show that:

- Overall nitrogen use on all crops and grassland, as a single category averaged at 142 kg/ha (peak 144 kg/ha) in the first five years (1983-1987) of the Great Britain data set. The means for each of the subsequent five year periods are 1988-92: 134 kg/ha, 1993-1997: 130 kg/ha, 1998-2002: 121 kg/ha and 2003-to date: 111 kg/ha, reflecting the downward trend observed on both grassland and, to a lesser extent, on tillage crops

- 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, 53 kg/ha in 1993-97 to 46 kg/ha for the period 1998-2002. For grassland 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 18 kg/ha for the period 2003-04. The 2003 rate of 40 kg/ha for tillage and 16 kg/ha for grassland are the lowest since Great Britain records began in 1983.

- Overall potash use on tillage crops had declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1998-1992, 62 kg/ha in 1993-1997. There was larger drop to 57 kg/ha for the period 1998-2002. 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 2003. 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 in 1989-91 and in 1997. Annual potash use between 1998-2002 has been consistently lower (mean: 26 kg/ha) than in earlier years and the value of 22 kg/ha in 2003 and 2004 represents the lowest values recorded since 1983.

SECTION A

THE BRITISH SURVEY OF FERTILISER PRACTICE

A1 INTRODUCTION AND STRUCTURE OF THE REPORT

The British Survey of Fertiliser Practice (BSFP) is unique in its range and in its aspiration to produce an accurate assessment of fertiliser use for England & Wales, and for Scotland. To achieve this aim, estimates from the survey data are used in conjunction with crop areas from the Annual Agricultural Census[3]. It relates applications of nutrients to major crop types and grassland throughout Great Britain. The report is the principal source of estimates for fertiliser applications in Great Britain, and is used by the British fertiliser industry, by Government and by the wider agricultural community. With such a high profile 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. Supplementary questions, which change each year, are also included in the Survey. Section D provides an analysis of information which was gathered in the 2004 Survey regarding the application protocols 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 [4,5,6,7].

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 responsibility for design and analysis transferred to the Rural Business Unit at the University of Cambridge and in 2004 this responsibility was conferred on Kynetec Limited, who also retained responsibility for conducting the fieldwork.

---

[3] Defra/SEERAD/NAWAD June Census data, 2003.

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

[5] 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.

[6] 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.

[7] Chalmers, A.G., Renwick, A.W., Johnston, A.E. and Dawson, C.J. (1999). Design, development and use of a national survey of fertiliser applications. *Proceedings No. 437*. York: The International Fertiliser Society.

A2 SURVEY METHODOLOGY

A2.1 SAMPLE

The basis of the sample framework is the Agricultural Census which is undertaken annually and records information on farm size, cropping, stocking and employment. Each year, two samples are extracted from the Census, one for England & Wales and one for Scotland. 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. This produces 20 stratification cells, 12 for England & Wales and 8 for Scotland, shown in Tables A2.1 and A2.2. Holdings less than 20 hectares in size are excluded from the BSFP sample. The process of random stratification results in more precise estimates than those which would be obtained by simple random sampling. The 'robust' farm types (coded 1-8) identified for each farm group classification in Tables A2.1 and A2.2 are defined in Section A2.4.

The fraction of farm holdings sampled from each cell is proportional to the total area of crops and grass (see Column 3, Tables A2.1 and A2.2). An exception to this is that in England & Wales a deliberate policy of over sampling is undertaken for the horticultural group to ensure sufficient numbers for a robust estimate to be made. The notional sampling fraction presented in Tables A2.1 and A2.2 indicates the percentage of the total population of holdings that are sampled in each cell. As the larger farms cover a greater area, then a higher proportion of these holdings are sampled. The process of selecting the actual holdings to be surveyed involves two steps. First the holdings in each cell are ordered by geographic location (using the County, Parish, Holding (CPH) identifier). This enables a high degree of geographic dispersion in the sample. The number of farms to be surveyed is then drawn at random from these stratified groups. This process leads to a *sought* sample (a total of 1,473 farms) that is representative of the population as a whole. The actual sample *achieved* is influenced, like all surveys, by a number of factors.

Current census data for the year of the survey were not available. Therefore, information used from the census to draw the annual sample is to some extent historic, being either one or two years old. For this reason not all of the holdings selected were actually eligible for the survey, simply through the process of structural change. In addition, as the survey is voluntary, it is also inevitable that there will be some non-response from those that are eligible. In the 2000 survey, a move was made towards establishing a core of co-operators who would stay in the survey for a certain number of years. This procedure is already used on other surveys by other departments of Defra. Co-operators in 1999 were asked if they would be prepared to stay in the survey and approximately one-third of the sample agreed to continue. It was also decided to have three reserve lists in an attempt to reduce the rate of non-response. Non-response is a problem as it may introduce bias into the survey. Clearly it would be wrong to assume that those farms that did not co-operate have the same level of fertiliser use as those that did. Reserve lists were drawn which matched geographically and by farm type and size to the continuing sample from 1999 (to provide alternatives if any of the continuing sample changed their minds). The rest of the main sample was drawn to complete the sample structure and three reserve lists were provided by selecting the nearest holding, as represented by the CPH number, which falls in the same stratification cell as the main list holding. This ensures that the geographical dispersion is maintained.

Table A2.1 Derivation of the stratified random sample for the 2004 survey, England and Wales

	farm holdings in population in 2003	total crops and grass in 2003 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
England & Wales						
Livestock						
(Defra robust types 4-7)						
crops & grass area						
20-50 ha	17864	6.2	0.43	76	112	0.63
51-100 ha	15799	11.7	0.91	143	181	1.15
101-200 ha	9522	13.4	1.73	165	163	1.71
200+ ha	3537	13.8	4.75	168	105	2.97
Crops & mixed						
(Defra robust types 1,2,8)						
crops & grass area						
20-50 ha	8949	6.7	0.93	83	74	0.83
51-100 ha	9191	13.6	1.81	166	144	1.57
101-200 ha	7756	31.1	4.90	380	255	3.29
200+ ha	7754	2.8	0.44	34	40	0.52
Horticulture						
(Defra robust type 3)						
crops & grass area						
20-50 ha	742	0.2	1.62	12	12	1.62
51-100 ha	243	0.2	3.70	9	8	3.29
101-200 ha	112	0.2	8.04	9	5	4.46
200+ ha	38	0.1	13.16	5	3	7.89
Total for England and Wales	81507	100.0		1250	1102	1.35

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. Any over sampling (or under sampling) that occurs through this process is corrected for by the use of weighting factors, which are the inverse of the achieved sampling fraction.

[a] The *notional sample fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2003*.

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2003*.

Table A2.2 Derivation of the stratified random sample for the 2004 survey, Scotland

	farm holdings in population in 2003	total crops and grass in 2003 (column %)	notional sampling fraction[a] (%)	target sample size	achieved sample size	achieved sample fraction[b] (%)
Scotland						
Cereal/general cropping/horticulture						
(SEERAD robust types 1-3)						
crops & grass area						
20-50 ha	1050	2.4	0.57	6	7	0.67
51-100 ha	1449	7.1	1.22	18	17	1.17
101-200 ha	1407	13.3	2.36	33	33	2.35
200+ ha	678	14.6	5.37	36	34	5.01
Livestock & mixed						
(SEERAD robust types 4-8)						
crops & grass area						
20-50 ha	2490	5.8	0.58	15	18	0.72
51-100 ha	3225	15.7	1.22	39	46	1.43
101-200 ha	2470	22.8	2.31	57	55	2.23
200+ ha	905	18.3	5.06	46	50	5.52
Total for Scotland	13674	100.0		250	260	1.90

A2.2 DATA COLLECTION

Data collection was undertaken between June and November 2004. In addition to collecting information on the fertiliser use on each field, the recorder collected general information on the holding and some supplementary information. The supplementary questions in 2004 considered a number of questions relating to the methods of applying organic manures and slurries.

A2.3 DATA PROCESSING

Some idea of the complexity of the survey can be gained from the amount data that has to be input and processed. In 2004 the 1,362 farms recorded represented two per cent of the total crops and grass area in Britain. This equated to over 10,000 fields and nearly 20,000 applications of fertiliser.

The high degree of detail collected per farm enabled analysis of fertiliser use at a number of levels; by crop, by type of fertiliser (straight or compound), by timing of application, by geographic region, etc. This enables the survey to present a comprehensive picture of fertiliser use in Britain. The longevity of the survey also means that it is invaluable for demonstrating the changing trends in fertiliser use.

[a] The *notional sample fraction* is found by expressing the *target sample size* as a percentage of the *farm holdings in population in 2003*.

[b] The *achieved sample fraction* is found by expressing the *achieved sample size* as a percentage of the *farm holdings in population in 2003*.

A2.4 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 2003 to autumn 2004, corresponding to the 2004 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 2003. 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 Arable Area 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 recorded in the survey.

4. In the report, **tillage** is defined as all crops except grass, forestry, glasshouse crops and land designated as 'set-aside' under the Arable Area Payments 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; $\mathbf{P_2O_5}$ for phosphate; $\mathbf{K_2O}$ for potash, $\mathbf{SO_3}$ 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 as with 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 Agricultural Census, 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 sum obtained by 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 EC system, aggregates a wide range of defined farm types into nine 'robust' types:

(1) Cereals;

(2) General Cropping;

(3) Horticulture;

(4) Pigs and Poultry;

(5) Dairy;

(6) Cattle and Sheep (LFA);

(7) Cattle and Sheep (low ground);

(8) Mixed;

(9) Other.

The composition of 'robust' types is presented in greater detail in Appendix 4. The sampling framework outlined in Section A2.1 can be related to robust types as set out below.

England & Wales:

BSFP sampling frame	*robust types*
cropping	1, 2, 8
livestock	4, 5, 6, 7
horticulture	3

Scotland:

BSFP sampling frame	*robust types*
mainly cropping	1, 2, 3, 8
mainly livestock	4, 5, 6, 7

Data presented in tables EW5.1 to EW5.4 and SC5.1 to SC5.4 in Section C are derived from the robust types shown below.

England & Wales:

table number	*farm type(s) as given in table title*	*robust types*
EW5.1	dairy farms	5
EW5.2	cattle and sheep farms	6, 7
EW5.3	other livestock farms	4, 8
EW5.4	cropping/horticultural farms	1, 2, 3

Scotland:

table number	*farm type(s) as given in table title*	*robust types*
SC5.1	general cropping farms	1, 2
SC5.2	dairy farms	5
SC5.3	mixed farms	4, 6, 7, 8
SC5.4	farms in Less Favoured Areas	All farms in LFAs

10. Regional analysis of the Survey data for England is based on the 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 19989. These revised regions are termed **BSFP regions** and are detailed in Appendices 3 and 4**.**

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.

12. Commentary in Section B suggesting possible reasons for observed differences in fertiliser practice is shown in *italics.*

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 Census estimates for areas of individual major crops, crop groupings and total tillage and grassland categories in 2002/03 and 2003/04, and illustrates percentage changes in relative cropping areas over the past five years. There were about 10.6 million hectares of managed agricultural land in Britain in 2004, of which 4.6 million hectares (43%) were cultivated for tillage cropping and the remainder, 6.0 million hectares, were grassland (excluding rough grazing).

The total tillage area was slightly higher (+2.6%) in 2004, mainly due to a decrease in the area of set aside. The area of wheat increased by 152,700 ha (+8%). The area of barley decreased by 37,400 ha (-8%) and 33,900 (-6%) for the winter and spring crops respectively. The total cereal area was up by 2.4% after a 4.6% decrease the previous year. Less land was entered as set aside giving a decrease of 18% from 2003. The total oilseed rape area increased by 38,100 ha (+8%), this was due in part to an increase in the winter sown crop (up 5.5%) but also to an increase in the area sown in spring (up 26% over the previous year). The linseed area was less than in the previous year and is now <1% of the total tillage area, considerably less than in 1999 when the economic returns for this crop were more favourable. The areas of potatoes and peas/beans increased by 2% and 4% respectively. The area of sugar beet decreased (-5%), this is the third year in a row that the area has declined. Other tillage crop categories and the total area of managed grassland showed little change in area (less than 1%), compared with 2003.

The total tillage area was 113,900 ha less (-2.4%) in 2004, compared to 1999. The total area of cereals was very similar (-0.1%) but there were changes in the areas of wheat (+9%) relative to barley (-14%) in 2004 compared with 1999. The biggest change occurring in winter barley which was nearly 128,500 ha less in 2003. The oilseed rape area was higher (+19%) as was the area of peas/beans (+21%). The areas of sugar beet and potatoes were down by 16% and 17% respectively in 2004 compared with 1999.

Table A3.1 Cropping and grassland areas ('000 ha) Great Britain, 2002/03 - 2003/04

Crops	2002/2003 000s ha	2003/2004 000s ha	% change since 2002/3	% change since 1998/99	2003/2004 crop areas as % of total tillage area
Wheat	1830	1982	8.3	9.2	43.4
Barley - winter	452	415	-8.3	-23.7	9.1
- spring	598	565	-5.7	-5.9	12.3
Total cereals[1]	*3021*	*3095*	*2.4*	*-0.1*	*67.7*
Oilseed rape - total	460	498	8.3	19.4	10.9
Sugar beet	162	154	-4.9	-15.8	3.4
Potatoes[2]	139	141	1.7	-16.9	3.1
Linseed	32	29	-10.0	-86.2	0.6
Peas/beans[3]	235	244	3.8	20.8	5.3
Maize/other fodder	178	179	0.5	9.7	3.9
Vegetables	124	124	0.1	-0.3	2.7
Total tillage[4]	*4454*	*4571*	*2.6*	*-2.4*	*100.0*
Set-aside[5]	678	555	-18.1	-2.7	10.8

Grassland					2003/2004 grass areas as % of total grass area
Less than 5 years old	1063	1109	4.4	2.2	18.3
5 years and older	4973	4940	-0.7	4.0	81.7
Total grass[6]	*6036*	*6050*	*0.2*	*3.6*	*100.0*
Total crops and grass[7]	*10461*	*10621*	*1.5*	*0.9*	

[1] including minor cereals (oats, rye, triticale, mixed corn)
[2] early + second early + maincrop potatoes
[3] harvested dry for animal consumption or, for peas, human consumption
[4] including other crops and bare fallow, but not set-aside
[5] including industrial crops; the percentage area is expressed as the ratio of set-aside area to the total area designated for cultivation
[6] managed grassland, excluding rough grazing
[7] total tillage + total grassland

Source: Annual Defra/SEERAD/NAWAD June Census data

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

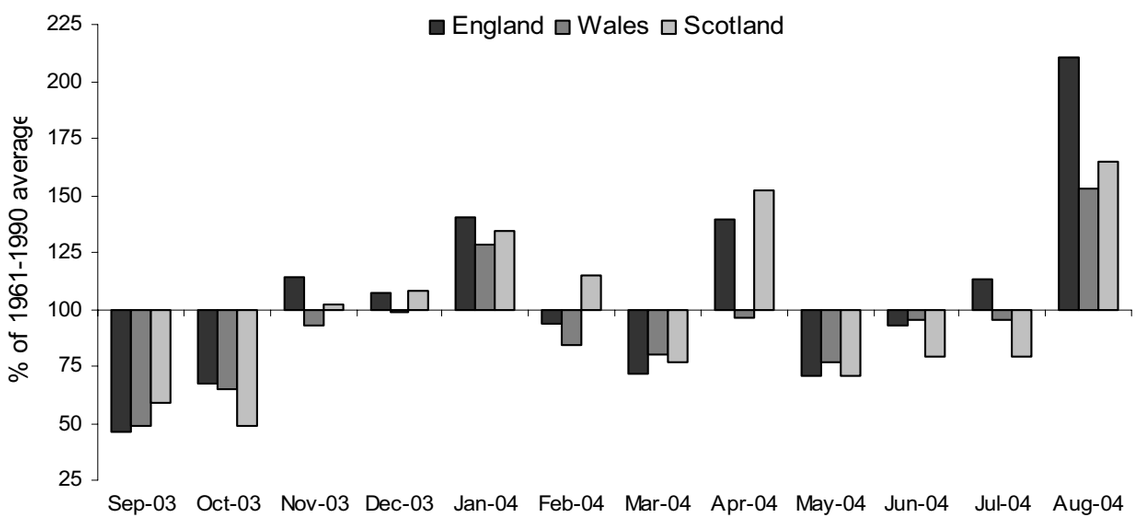
- *A very wet (or very dry) autumn can delay the establishment of winter sown crops, or alter the ratio of winter to spring sown crops, with their different fertiliser requirements.*
- *Prolonged wet weather can increase leaching losses of some nutrients, particularly nitrogen and sulphur. Weather conditions also affect other aspects of soil chemistry and nutrient availability.*
- *Adverse weather conditions can disrupt planned farming activities, such as fertiliser spreading.*
- *Growing conditions determine plant growth and hence affect nutrient requirements.*

As in the previous year when weather conditions were also dry, autumn 2003 caused problems for autumn drilling. In general September and October were very dry (Figure A3.1) and as a result germination of autumn sown crops was slow. Oilseed rape in particular was badly affected with patchy development and many crops were replaced with spring sown crops. This explains the increase in spring oilseed rape area.

The dry autumn conditions also affected the potato harvest making lifting difficult and increasing the incidence of bruising. Autumn growth of grass for late grazing was also affected. Conditions during the winter and summer were generally warmer than average and 2004 ranked as the 5th warmest in Central England where temperature series date back to 1659. The warmer years were 1949, 1990, 1999 and 2002. Rainfall in August was much higher than average (Figure A3.1) and adversely affected the cereal harvest.

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

Figure A3.1 Monthly rainfall as a % of the long term average (source: Met Office[8])



[8] 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 2000 to 2004. Comments on longer term trends are made in Section B2, using data available from what were, prior to 1992, two separate Surveys of Fertiliser Practice, for England & Wales and for Scotland.

The estimates of overall application rates from the survey relate to usage on farms during the 2003/2004 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 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 8.7 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[9]. A summary of the last 15 years data is available in Chalmers 2001[10].

The nutrient rates presented and discussed in the main text of this Report are based on crop areas estimated from the survey data. Data from the 2003 Agricultural Census on crop areas have been summarised in Table A3.1. Crop area estimates from the Agricultural Census have greater reliability as they are derived from a far larger sample of farms. Census crop areas are used in the Appendix of the report to re-estimate application rates, for total tillage and grassland crop groupings, taking into account the limitations of survey crop area estimates extrapolated from a comparatively small survey sample. These adjusted rates have now been calculated for several years and the adjusted estimates are generally very close to those reported in Section B of the annual Reports, and this has proved to be the case again this year.

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

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

B1 2004 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. Application rates for straight and compound nitrogen applied on crops and grassland are also presented in Table B1.1. Definitions of the terms used are set out in Section A of this report.

Figure B1.1 Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 2000 - 2004

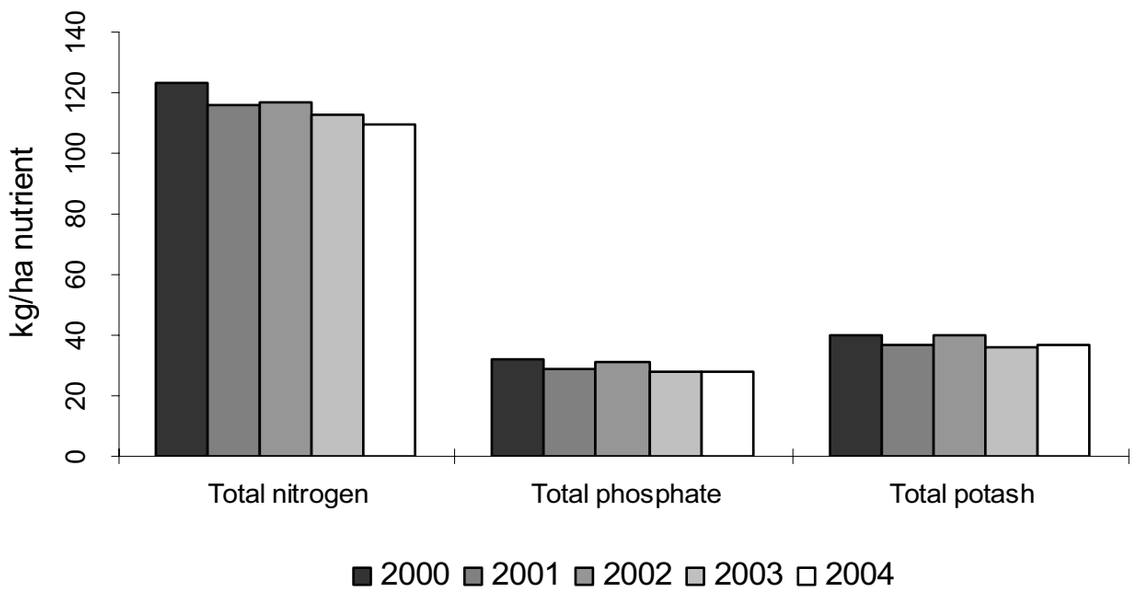


Table B1.1 Overall nitrogen use (kg/ha), Great Britain 2000 - 2004

Total nitrogen

	tillage crops	*grass*	*all crops and grass*
2000	149	99	123
2001	145	94	116
2002	152	89	117
2003	149	83	113
2004	152	77	110

Straight nitrogen

	tillage crops	*grass*	*all crops and grass*
2000	130	43	85
2001	118	39	74
2002	128	32	76
2003	129	31	74
2004	132	27	73

Compound nitrogen

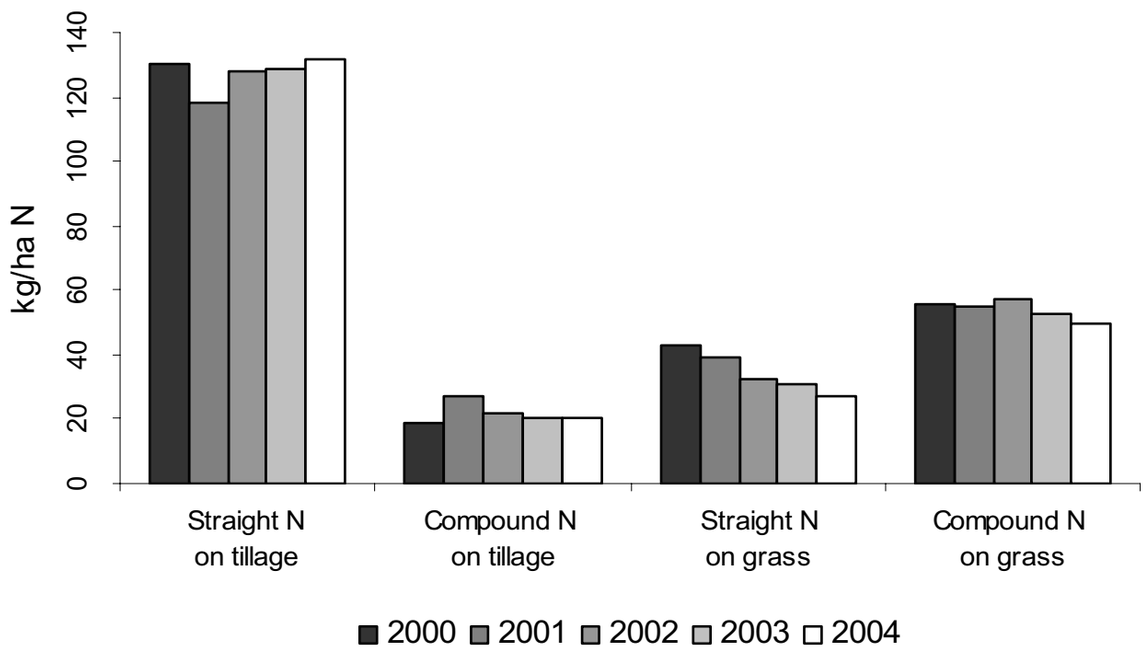
	tillage crops	*grass*	*all crops and grass*
2000	19	56	38
2001	27	55	42
2002	22	57	42
2003	20	53	38
2004	20	50	37

B1.1.1 NITROGEN

All crops and grassland

The total nitrogen use on all crops and grassland declined slightly in 2004 compared with the rates in 2003 (Figure B1.1), due to a decrease in the amount applied to grass (Table B1.1). This decline is associated with a drop in the overall application rate of both straight nitrogen and compound N (Figure B1.2). Conversely, on tillage land, the use of straight nitrogen has increased slightly, whilst levels of compound N have remained the same as 2003. The relatively high level of compound to tillage in 2001 probably reflects the effects of the wet autumn in 2000 on crop management.

Figure B1.2 Overall straight and compound nitrogen use (kg/ha), Great Britain 2000 - 2004



Tillage crops

Overall total nitrogen use (152 kg/ha) increased slightly from the 2003 level to match the 2002 level which was the highest in the 5 year period. Over recent years changes in cropping areas (notably in 2001 and to a lesser extent in 2003), rather than application rates to individual crops, have been the major factor influencing the pattern of nitrogen use on the all tillage crops category.

Grassland

Overall total nitrogen use on grassland continued to show a decline with a drop of 6 kg/ha from the previous year. This was due to a decrease in the use of both compound N (-3 kg/ha) and straight nitrogen (-4 kg/ha), the area receiving nitrogen remained unchanged. The total nitrogen rate (77 kg/ha) was the lowest reported for both the last five years (mean: 88 kg/ha) and also 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.

B1.1.2 PHOSPHATE AND POTASH

Phosphate

Overall phosphate use on tillage crops in 2004 was very similar at 41 kg/ha to the previous year which, at 40 kg/ha, was the lowest rate for the period (Table B1.2). Phosphate use on grassland decreased very slightly (-1 kg/ha) compared with the previous year to 17 kg/ha and represents the lowest rate for the period. Over the last five years phosphate use on all crops and grassland has dropped by 4 kg/ha, from 32 to 28 kg/ha. The area of tillage crops and grassland receiving phosphate fertiliser was similar to previous years (and the same as the five year mean) at 65% and 59% respectively.

Table B1.2 Overall phosphate and potash use (kg/ha), Great Britain 2000 - 2004

Total phosphate

	tillage crops	*grass*	*all crops and grass*
2000	47	20	32
2001	43	19	29
2002	44	20	31
2003	40	16	28
2004	41	17	28

Total potash

	tillage crops	*grass*	*all crops and grass*
2000	55	26	40
2001	52	24	37
2002	57	25	40
2003	54	22	36
2004	55	22	37

Potash

Potash use on tillage crops increased slightly (+1 kg/ha) to 55 kg/ha in 2004. The overall rate of potash on grassland remained at the same low level for the period at 22 kg/ha. Over the last five years, potash use on all crops and grassland has dropped by 3 kg/ha, to 37 kg/ha. The area of tillage crops receiving potash fertiliser was similar to previous years at 67% (five year mean: 66%), whilst for grassland the area receiving potash fertiliser increased slightly to 58% (five year mean: 58%).

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 2004 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 2000 - 2004

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	188	107	146	160	195	104
2001	185	111	145	151	193	103
2002	193	110	154	158	199	106
2003	197	107	148	152	191	103
2004	197	104	144	154	202	95

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	177	62	134	32	180	91
2001	171	66	127	37	176	83
2002	178	66	132	52	181	91
2003	186	61	128	37	179	91
2004	186	59	125	49	189	85

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	11	45	12	128	15	13
2001	14	45	19	115	17	20
2002	15	43	22	108	18	15
2003	12	46	20	116	13	13
2004	11	45	19	105	13	10

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	44	47	48	159	41	39
2001	42	43	45	127	41	36
2002	41	45	46	123	50	43
2003	39	44	41	130	38	34
2004	39	44	46	125	39	36

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	47	56	61	234	43	91
2001	45	51	64	184	42	78
2002	47	56	62	221	50	104
2003	47	57	59	214	42	91
2004	48	57	62	201	46	104

[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 2000 - 2004

Total nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	193	112	150	174	195	108
2001	189	114	149	175	196	106
2002	197	113	156	172	201	112
2003	199	111	149	163	194	108
2004	199	106	145	156	203	103

Straight nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	185	96	142	73	190	105
2001	184	95	143	96	186	100
2002	189	94	150	101	187	105
2003	193	90	143	122	185	105
2004	195	87	140	101	195	102

Compound nitrogen

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	49	65	44	156	47	75
2001	70	72	62	155	59	93
2002	63	63	61	129	52	81
2003	60	69	70	143	42	60
2004	63	33	33	131	52	64

Total phosphate

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	69	58	65	187	70	76
2001	66	55	65	163	64	76
2002	69	57	64	141	71	82
2003	64	54	60	149	60	63
2004	63	53	61	146	62	71

Total potash

	winter wheat	*spring barley*	*winter barley*	*maincrop potatoes*[a]	*oilseed rape*[b]	*sugar beet*
2000	77	66	80	265	75	142
2001	72	64	82	231	68	124
2002	80	68	80	235	77	129
2003	77	66	78	237	68	125
2004	78	65	79	231	72	130

[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 barley (winter and spring), and sugar beet in 2004, and increased on oilseed rape and maincrop/second early potatoes. The rate for winter wheat remained unchanged. Except for potatoes (where there was a decrease) the average field rates (Table B1.4) showed a similar trend.

Winter wheat

After increases in 2002 and 2003, the overall rate of total nitrogen on winter wheat remained unchanged at 197 kg/ha in 2004, the highest level in the five year period (Table B1.3). The average field rate (Table B1.4) followed a similar pattern and at 199 kg/ha was also unchanged and the highest for the period. The majority of the nitrogen continued to be applied in the straight form.

The field cropping information collected in the Survey enables separate estimates to be made of nitrogen fertiliser use on milling and non-milling (feed/seed) categories of winter wheat (Table B1.5).

Table B1.5 Average field application rates (kg/ha) of nitrogen on cereals by market use, Great Britain 2000 - 2004

Total nitrogen

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2000	211	184	105	103	135	154
2001	209	182	119	100	137	151
2002	208	192	118	101	149	159
2003	215	191	114	99	145	152
2004	224	188	111	99	134	151

The mean difference of 26 kg/ha in average nitrogen rate between milling and non-milling wheats reflects differences in crop husbandry and nitrogen management practices.

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[11]. 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. 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 be the major crop area (Table B1.6) with only 30% of the crop area in 2004 as milling wheat (5 year mean: 30%).

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

Table B1.6 Percentage distribution (% crop area) of cereal crop areas by market use, Great Britain 2000 - 2004, as estimated from the Survey

	winter wheat		*spring barley*		*winter barley*	
	milling	*non-milling*	*malting*	*non-malting*	*malting*	*non-malting*
2000	28	72	59	41	27	73
2001	31	69	54	46	31	69
2002	27	73	61	39	33	67
2003	33	67	63	37	36	64
2004	30	70	60	40	33	67

Spring barley

Overall use of total nitrogen on spring barley declined slightly to 104 kg/ha in 2004 which is the lowest for the five year period (mean: 108 kg/ha). The overall rate of straight nitrogen decreased in 2004 falling to the lowest value for the period (59 kg/ha) whilst the compound nitrogen rate decreased slightly to 45 kg/ha. The lowest value for the period was 43 kg/ha in 2002. Average field rates showed a similar pattern.

Further analysis of the data by crop type (Table B1.5) shows a decline in the average rate applied to the spring malting crop in 2003 and 2004 compared with the high rates of the previous two years. For non-malting crops nitrogen application rate was at its highest for the period (103 kg/ha) in 2000. In 2004 it remained the same as the low level (99 kg/ha) applied 2003.

Estimated nitrogen rates on malting crops have been consistently slightly higher on malting than non-malting crops, with a mean difference of 13 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)[12]. 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 2000-2004 is 59%.

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

Winter barley

Overall total nitrogen use on winter barley decreased in 2004 to 144 kg/ha after reaching the highest level (154 kg/ha) for the 2000-2004 period in 2002 (mean: 147 kg/ha). The overall use of straight nitrogen has fluctuated during the period and at 125 kg/ha in 2004 is the lowest for the five year period (mean: 129 kg/ha). The overall compound nitrogen rate has also fluctuated with the lowest level of 12 kg/ha in 2000 and the highest level of 22 kg/ha in 2002 (mean: 18 kg/ha). Average field rates show a similar pattern.

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 continued to decline on malting crops (-11 kg/ha) to 134 kg/ha and by 1 kg/ha to 151 kg/ha on non-malting crops in 2004 after the high levels of 2002 (Table B1.5)

The higher application rates of nitrogen (five-year mean of +13 kg/ha) on non-malting, compared to malting winter barley crops, reflect typical agronomic practice. 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.

After a gradual increase from 2000 to 2003 the survey estimates showed a drop in the relative crop area grown for malting in 2004, down to 33% (Table B1.6).

Maincrop potatoes

Overall total nitrogen use on maincrop[a] potatoes has fluctuated over the last five years, in 2004 it increased by 2 kg/ha to 154 kg/ha, slightly below the five year mean of 155 kg/ha (Table B1.3). This increase appears to be mainly due to an increase in the area receiving straight nitrogen. Overall most of the nitrogen input for maincrop potatoes is applied in compound form.

Oilseed rape

Overall total nitrogen use on oilseed rape, as a combined category for both the autumn and spring sown crop, increased in 2004 to the highest level for the 2000-2004 period (202 kg/ha) after reaching the lowest level (191 kg/ha) in 2003 (mean: 196 kg/ha). The average field rate showed a similar fluctuation. Straight nitrogen is the main source of nitrogen for the oilseed rape crop.

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 has been relatively stable during the 2000-2003 period (range: 203-211 kg/ha) compared with the spring crop (range: 133-151 kg/ha). The highest levels occurred in 2004 and 2001 respectively. The five-year mean nitrogen rates were 207 kg/ha for winter oilseed rape, compared to 140 kg/ha for spring oilseed rape.

Table B1.7 Average field application rates of nitrogen (kg/ha) on winter and spring oilseed rape and percentage distribution (%) of crop areas, Great Britain 2000 - 2004

Total nitrogen (kg/ha)

	winter oilseed rape	*spring oilseed rape*
2000	203	133
2001	209	151
2002	207	137
2003	206	141
2004	211	136

Percentage distribution (%)

	winter oilseed rape	*spring oilseed rape*
2000	90	10
2001	81	19
2002	91	9
2003	81	19
2004	89	11

Most of the oilseed rape area is autumn, rather than spring sown (Table B1.7). The lowest areas of winter crops (81%) occurred in 2001 and 2003. The high level of spring cropping in 2001 was almost certainly due to the very wet conditions in autumn 2000. In contrast the autumns of 2002 and 2003 were very dry during August and September so that 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 decreased (-8 kg/ha) in 2004 to 95 kg/ha, this is less than the mean for the five year period 2000-2004 of 102 kg/ha. Average field rates showed a similar pattern of slight fluctuations with a five year mean of 107 kg/ha. Most of the nitrogen input for sugar beet is applied as straight nitrogen.

B1.2.2 PHOSPHATE AND POTASH

Phosphate

The small change in overall phosphate use on tillage crops in 2004 can be partly attributed to the lack of change in use on most of the major arable crops (Table B1.3). Only winter barley (down) and potatoes (up) showed a significant change in rate. Average field rates showed the biggest changes for potatoes (down) and sugar beet (up). In spite of annual fluctuations the underlying trend for the major tillage crops from 2000-2004 is a reduction in both overall and average field rates of phosphate use. The area receiving phosphate fertiliser has fluctuated throughout the five year period, except for wheat where there is a gradual decline from 64 to 61% (mean: 62%).

Overall phosphate rates for cereals in 2004 were: winter wheat 39 kg/ha, spring barley 44 kg/ha, and winter barley 46 kg/ha (+5 kg/ha) (Table B1.3). The rate for winter wheat was the lowest recorded value in the period 2000 to 2004. The average field rate for each cereal crop were 63, 53 and 61 kg/ha for winter wheat, spring barley and winter barley respectively. The rates for winter wheat and spring barley were the lowest for the five year period. The area receiving phosphate fertiliser remained lower for winter wheat (61%) and winter barley (74%) than for spring barley (84%), this is mainly due to the greater use of NPK compounds on the latter.

The overall rate of phosphate on maincrop/second early potatoes was reduced by 5 kg/ha to 125 kg/ha in 2004, this is one of the lowest values for the five year period (mean: 132 kg/ha). The average field rate shows similar annual variation (mean: 157 kg/ha). Except in 2001 when it was 78%, the area of maincrop potatoes receiving phosphate has been relatively static (range: 85-87%) during the other four years.

The overall application rate of phosphate showed little change in 2004 (39 kg/ha) compared with 2003 (38 kg/ha), the latter being the lowest value for the period. The highest rate occurred in 2002 and the mean for the period 2000-2004 was 42 kg/ha. The average field rate shows similar fluctuations.

The recorded overall rate of phosphate on sugar beet increased slightly in 2004 to 36 kg/ha from the lowest value for the period of 34 kg/ha in 2003 (mean: 38 kg/ha). The average field rate shows similar fluctuations. There was little change in area receiving phosphate fertiliser at 51% (mean: 51%).

Potash

Overall potash use on tillage crops showed little change in 2004, partly due to the limited changes in application rates on cereal crops which represent a large area of the major tillage crops. Average field rates of potash use on cereals are also largely unchanged in 2004. For each of the major tillage crops the area receiving potash fertiliser has remained fairly static but the average field rates of potash on these crops have fluctuated throughout the period.

The overall potash use on cereals was largely unchanged at 48, 57 and 62 kg/ha for winter wheat, spring barley and winter barley respectively (Table B1.3). The corresponding average field rates were 78, 65 and 79 kg/ha (Table B1.4). The area receiving potash fertiliser has remained fairly static throughout the period 2000-2004.

The overall potash rate on maincrop potatoes decreased in 2004 by 13 kg/ha to 201 kg/ha. There has been a great deal of fluctuation in overall rate during the period 2000-2004 (range: 184-234 kg/ha, mean: 211 kg/ha). In comparison the average field rate has been less variable (range: 231-265 kg/ha, mean: 240 kg/ha). Thus the fluctuations in overall rate appear to be due

to changes in the area receiving potash fertiliser (for example only 79% in 2001 compared with 91% in 2003).

In 2004 potash use on oilseed rape increased to 46 kg/ha for the overall rate and 72 kg/ha for the average field rate. The highest overall potash use for the five-year period was 50 kg/ha in 2002 (mean: 45 kg/ha).

Overall rates of potash for sugar beet have fluctuated throughout the period 2000-2004 (Table 1.3), with the highest values (104 kg/ha) in 2002 and 2004 and the lowest value (78 kg/ha) in 2001. The mean for the five year period is 94 kg/ha. Fluctuations in overall rate are partly related to average field rate and partly with changes in the area receiving fertiliser. For example the increase in overall rate in 2004 was associated with an increase in the average field rate of +5 kg/ha and by an increase in the dressing cover from 72% to 80%.

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 contractors, is less reliably reported by farmers than for self-applied products.

B1.2.3 SULPHUR

The risk of sulphur deficiency in crops such as oilseed rape, cereals and intensively cut grass, which have a high sulphur requirement, has increased appreciably over the last decade. Sulphur reserves have become depleted in some soil types, particularly sandy and shallow soils, because of the continuing reduction in sulphur dioxide emissions from industrial sources and consequent decline in atmospheric deposition of sulphur over the last thirty years[13]. Sulphur application is now an essential agronomic requirement for susceptible crops grown in most parts of Great Britain.

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 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. There have been further increases since then with over half the oilseed rape crop now being treated (Table B1.8).

Over the last five years the underlying trend in average application rates has been upwards although for cereals the levels in 2004 have stayed the same or declined compared with 2003. The rate for oilseed rape is the highest ever recorded (85 kg/ha) (Table B1.8). The rates applied are generally higher than the recommended practice of 25-40 kg/ha SO_3, applied as a water soluble form in early spring, for potentially sulphur-deficient cereal crops and 50-75 kg/ha for oilseed rape[14].

---

[13] McGrath S P, Zhao F J and Blake-Kalff M M A (2002). History and outlook for sulphur fertilisers in Europe. *Proceedings No. 497.* The International Fertiliser Society, York. ISBN 0 85310 133 7.

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

Table B1.8 Dressing cover (% area) and average application rate (kg/ha SO_3) of sulphur on cereals and oilseed rape, Great Britain 2000 - 2004

Dressing cover (%)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2000	15	16	18	29
2001	18	19	15	26
2002	28	27	25	47
2003	30	35	27	54
2004	*38*	*37*	*27*	*57*

Average field rate (kg/ha SO_3)

	winter wheat	*winter barley*	*spring barley*	*oilseed rape*
2000	49	45	39	68
2001	51	48	36	61
2002	48	54	40	78
2003	53	53	48	74
2004	53	48	46	85

In general a higher proportion of cereal and oilseed crops are treated with sulphur in Scotland than in England & Wales (Table B1.9). This regional difference probably reflects 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. However there is evidence in recent years that farmers in England & Wales are now more aware of the need to apply sulphur.

Table B1.9 Dressing cover (% area) of sulphur on cereals and oilseed rape by region, 2000 - 2004

		winter wheat	*winter barley*	*spring barley*	*oilseed rape*
England & Wales	*2000*	13	14	14	25
	2001	17	14	11	23
	2002	27	22	20	43
	2003	29	34	27	55
	2004	37	35	25	57
Scotland*	*2000*	45	29	22	55
	2001	34	35	19	56
	2002	51	54	28	72
	2003	42	39	28	49
	2004	59	57	29	60

* Scottish data are apparently more variable due to smaller sample sizes.

B1.3 FERTILISER USE ON GRASSLAND

Overall fertiliser usage on grassland in Great Britain over the last five years, as previously shown in 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 2000 - 2004

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2000	43	56	99	20	26
2001	39	55	94	19	24
2002	32	57	89	20	25
2003	31	53	83	18	22
2004	27	51	77	17	22

The 6 kg/ha drop in overall total nitrogen use on grassland in 2004 was associated with a decrease in the average field rate for nitrogen (Table B1.11) which at 109 kg/ha is the lowest for the period.

Over the last five years, the dressing cover for straight nitrogen has shown a gradual decline from a level of 35% in 2000 down to 25% in 2004. The corresponding average field rates have not shown any consistent change during this period. The area receiving compound nitrogen has fluctuated during the period, reaching its lowest level (56%) in 2003, (period mean: 59%). The average field rate for compound nitrogen has also fluctuated but not in the same pattern, the lowest rate for the period (84 kg/ha) occurring in 2000 (period mean: 92%).

Table B1.11 Dressing cover (%) and average application rate (kg/ha) of fertiliser on grassland, Great Britain 2000 - 2004

Dressing cover (%)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2000	35	67	75	60	59
2001	31	57	72	58	58
2002	28	59	73	60	59
2003	27	56	70	57	57
2004	25	58	70	59	59

Average field rate (kg/ha)

	straight nitrogen	*compound nitrogen*	*total nitrogen*	*total phosphate*	*total potash*
2000	123	84	133	34	45
2001	128	96	133	32	42
2002	113	97	122	33	42
2003	114	94	119	31	39
2004	107	88	109	29	38

Average field rates for phosphate and potash were at their lowest level for the five year period in 2003, falling to 29 kg/ha for phosphate and 38 kg/ha for potash compared with a mean for the period of 32 kg/ha and 41 kg/ha respectively. The dressing cover which has varied throughout the last five years, increased slightly in 2004 after reaching the lowest level for both phosphate and potash in 2003 (five year mean: 59% phosphate and 58% potash).

B1.3.1 NITROGEN

The survey information collected for grassland fields enables nitrogen and other fertiliser nutrient usage to be assessed in more detail according to sward management practice.

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 England & Wales and in Scotland in 2004 are presented in Section C tables. The Survey estimates for annual distributions of the total grassland area between grazing and cutting management regimes since 2000 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. 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 B1.12 Grassland utilisation (% of grass area), Great Britain 2000 - 2004

	grazed [a]	*silage* [b]	*hay* [b]
2000	93	33	13
2001	91	38	10
2002	92	31	10
2003	93	29	10
2004	94	29	11

Nearly all grassland is grazed at some stage during the season (Table B1.12). In 2001 grazing and hay decreased whilst silage increased. It is not possible to say how much this may have been influenced by Foot and Mouth. Since then grassland utilisation for cutting and grazing had shown very little change.

[a] May also be cut.

[b] May also be grazed.

Table B1.13 Nitrogen application rates (kg/ha) by grassland utilisation, Great Britain 2000 - 2004

Total nitrogen

	overall application rate				average field rate		
	grazed[a]	silage[b]	hay[b]		grazed[a]	silage[b]	hay[b]
2000	97	147	86	*2000*	130	163	110
2001	91	142	63	*2001*	130	165	85
2002	85	133	72	*2002*	117	155	105
2003	81	130	69	*2003*	115	150	100
2004	75	121	61	*2004*	107	137	91

Straight nitrogen

	overall application rate				average field rate		
	grazed[a]	silage[b]	hay[b]		grazed[a]	silage[b]	hay[b]
2000	48	59	42	*2000*	127	135	104
2001	40	52	23	*2001*	130	131	81
2002	31	44	29	*2002*	112	114	95
2003	29	43	31	*2003*	114	117	100
2004	26	40	27	*2004*	107	113	92

Compound nitrogen

	overall application rate				average field rate		
	grazed[a]	silage[b]	hay[b]		grazed[a]	silage[b]	hay[b]
2000	49	88	44	*2000*	72	94	86
2001	51	90	40	*2001*	95	127	75
2002	55	89	43	*2002*	93	124	85
2003	51	87	38	*2003*	91	117	76
2004	50	83	35	*2004*	86	109	72

During the period 2000-2004 overall total nitrogen rates have shown a net decrease for both grazed and silage categories, whilst rates for hay have fluctuated. The changes in overall application rate of total nitrogen appear to be mainly due to the changes in the average field rate. In 2001 the dressing cover was reduced significantly for all types of grassland probably due to Foot and Mouth. In 2004 the 70% of all grass received nitrogen. For cut grass 88% of silage and 67% of hay received nitrogen.

The overall use of straight nitrogen on grazed grass and silage has declined steadily over the last five years, partly as a result of reductions in the dressing cover but in 2002 also due to the large reduction in average field rate. The rates for hay are more variable. Compound nitrogen inputs have fluctuated during the last five years with low rates in 2004 compared with the five year means for all categories of management. The five year means for overall nitrogen rate being 51, 87 and 40 kg/ha for grazed grass, silage and hay respectively.

The fall in nitrogen use on grassland throughout the period can be attributed to decreases in livestock numbers which has reduced herbage production requirements. Also in 2001 Foot and Mouth led to a major reduction in livestock numbers with nearly 6 million animals destroyed either to combat disease or for welfare reasons which further reduced herbage production requirements. Although there was a partial recovery in 2002 the area receiving N fertiliser remains lower than in 2000.

---

[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 sward management system.

Table B1.14 Phosphate and potash use (kg/ha) by grassland utilisation, Great Britain 2000 - 2004

Total phosphate

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2000	20	30	18	*2000*	33	40	33
2001	18	27	15	*2001*	31	38	28
2002	19	30	20	*2002*	32	42	37
2003	17	27	16	*2003*	30	37	31
2004	17	26	14	*2004*	29	36	29

Total potash

	overall application rate				*average field rate*		
	grazed [a]	*silage* [b]	*hay* [b]		*grazed* [a]	*silage* [b]	*hay* [b]
2000	25	47	21	*2000*	43	62	42
2001	23	45	18	*2001*	40	59	35
2002	23	47	24	*2002*	40	63	44
2003	21	43	18	*2003*	37	57	36
2004	21	42	18	*2004*	36	53	36

Overall phosphate rates fluctuated throughout the period 2000-2004 (Table B1.14), with an underlying downward trend for grazed grass. In 2004 the rates of 17, 26 and 14 kg/ha for grazed grass, silage and hay respectively were the lowest or equal lowest for the period. The corresponding five year means were 18, 28 and 17 kg/ha. Average field rates showed a similar pattern. Grass cut for silage is more likely to receive phosphate (74%) than grazed grass (59%) or hay (49%).

Like phosphate there have been fluctuations in overall potash rates between years but the underlying trend is downwards with a net decrease in inputs to all types of grass. Overall rates in 2004 were the lowest (or equal lowest) for the period. The biggest decline has occurred with grazed grass and silage. Average field rates show a similar trend. Grass cut for silage is more likely to receive potash (79%) than grazed grass (59%) or hay (50%).

Most phosphate and potash fertiliser inputs on grassland are applied in some form of NPK compound (Section C).

[a] May also be cut.

[b] May also be grazed.

B1.3.3 SULPHUR

The risk of sulphur deficiency is increasing[15] in grassland, where it can cause loss of herbage yield. Quality is also affected because sulphur deficiency causes a widening of the N:S ratio in grassland which results in a reduction in digestibility for ruminants. The risk is greatest where grassland is cut intensively for silage, and is less likely where swards are used mainly for grazing or single hay cuts. Potential yield losses of silage due to sulphur deficiency on coarse textured or shallow soils in low sulphur deposition areas are most likely to occur in second and subsequent cuts, rather than first cut, unless the deficiency is very severe. The Survey data confirm that, as expected, 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 decreased slightly in 2001 (possibly due to Foot and Mouth), but have increased since, most notably on silage in 2002. The total area of grass treated in 2004 (6%) was similar to that in the previous year and represents a 4% increase from the value recorded in 1993, when information on sulphur applications was first collected in the Survey.

The significant proportion of heavier textured soil types which occur in the main grassland farming areas, and inputs of sulphur from slurry applications to silage fields, are among possible reasons for the current low level of sulphur fertiliser use on grassland. Insufficient farmer awareness about the risks of sulphur deficiency in cut grass, particularly for second cut silage, may also be a contributory factor.

Table B1.15 Sulphur use on grassland, Great Britain 2000 - 2004

Dressing cover (%)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2000	4	9	4	5
2001	2	5	2	2
2002	5	12	4	6
2003	4	10	6	5
2004	5	10	5	6

Average field rate (kg/ha SO_3)

	grazed [a]	*silage* [b]	*hay* [b]	*all grass*
2000	40	44	41	41
2001	34	33	30	31
2002	42	48	57	44
2003	37	44	44	40
2004	36	37	29	38

Estimated average field rates of sulphur application for each sward management category did not show any consistent changes during 2000-2004, with five year means of 38, 41 and 40 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. The recommended rate for silage grass is 40 kg/ha SO_3 for each susceptible cut.

---

[15] McGrath S P, Zhao F J and Blake-Kalff M M A (2002). History and outlook for sulphur fertilisers in Europe. *Proceedings No. 497.* The International Fertiliser Society, York. ISBN 0 85310 133 7.

[a] May also be cut.

[b] May also be grazed.

B2 LONGER TERM TRENDS

B2.1 LONGER TERM TRENDS FOR GREAT BRITAIN

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, however, 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. Data series are also presented in this section for England & Wales, starting from 1969 when the present design of the survey was first used, and for Scotland, beginning in 1983. The aggregated data for Great Britain follow a similar pattern to that observed for England & Wales, because a large proportion of both the tillage and grassland areas in Britain is located in England & Wales.

B2.1.1 NITROGEN USE

Table B2.1 Total overall nitrogen application rates (kg/ha), Great Britain 1983 - 2004

	tillage crops	*grass*	*all crops and grass*
1983	149	126	136
1984	157	131	143
1985	157	131	144
1986	152	132	142
1987	157	130	143
1988	146	119	132
1989	147	124	136
1990	147	129	138
1991	151	129	139
1992	147	105	124
1993	137	112	123
1994	149	116	131
1995	149	118	132
1996	145	113	128
1997	149	123	136
1998	144	109	126
1999	141	110	125
2000	149	99	123
2001	145	94	116
2002	150	89	117
2003	149	83	113
2004	152	77	110

Overall total nitrogen rates for tillage crops and grassland in Great Britain since 1983 are summarised in Table B2.1 and presented graphically in Figure B2.1(a). Overall nitrogen use has been consistently higher on tillage crops than on grassland ever since the British survey started.

The maximum overall rate of nitrogen on tillage crops was recorded in the mid 1980s, at 157 kg/ha. Overall nitrogen use dropped in 1988 and, since then, has remained at a lower level with annual rates mostly in the range 145-149 kg/ha. However, larger fluctuations in overall nitrogen rates were recorded in both 1991, when there was a temporary increase to 151 kg/ha, and in 1993, when the application rate fell sharply to 137 kg/ha. Overall nitrogen use showed another, smaller drop in 1998-99 before reaching a levels of 149 kg/ha in 2000. The 152 kg/ha

rate in 2004 is the highest since 1987. The downward shift in total nitrogen use on tillage crops during the 1980s and 1990s was caused by the combined effects of changes in:

(i) the relative cropping areas of the major arable crops, as influenced by seasonal weather and market economic factors,

(ii) the widespread introduction of set-aside in 1993,

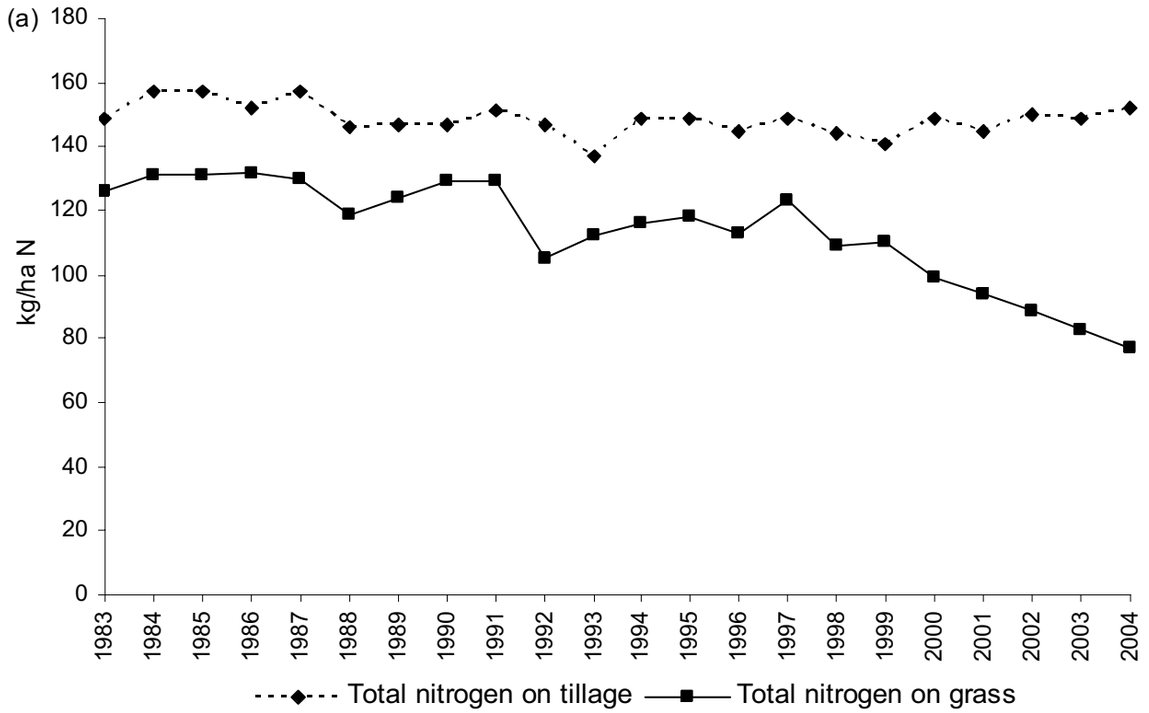
(iii) the nitrogen application rates for particular crops (see Figure B2.2 (a)).

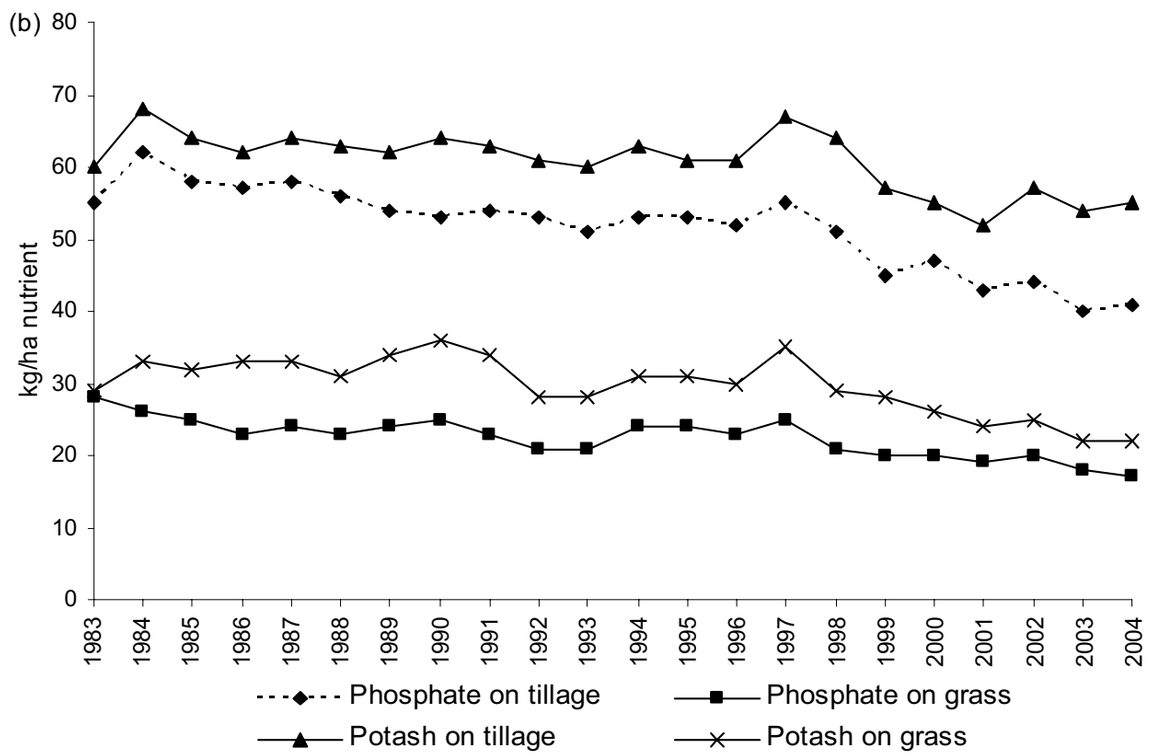
Most of total nitrogen fertiliser used on tillage crops each year has, since 1983, been applied in straight form.

Overall nitrogen use on grassland also peaked in the mid 1980s, at around 131 kg/ha, and then dropped very sharply to 119 kg/ha in 1988 before largely recovering over the following three years. Subsequent nitrogen use has, however, declined as a result of the net effects of a very significant drop in overall application rate in 1992 and, despite some recovery over the following five years, further falls occurred in 1998 through to 2004. The overall nitrogen rate of 77 kg/ha on grassland in 2004 was the lowest rate recorded so far in the British survey and, over a longer timescale, this level of nitrogen use had not been observed in England & Wales since the early 1970s (see Figure B2.3 (a)).

Overall nitrogen use on all crops and grassland, as a single category averaged at 142 kg/ha (peak 144 kg/ha) in the first five years (1983-1987) of the Great Britain data set. The means for each of the subsequent five year periods are 1988-92: 134 kg/ha, 1993-1997: 130 kg/ha, 1998-2002: 121 kg/ha and 2003-to date: 111 kg/ha, reflecting the downward trend observed on both grassland and, to a lesser extent, on tillage crops (Table B 2.1).

Figure B2.1 **Overall application rates (kg/ha) of (a) total nitrogen and (b) phosphate and potash on tillage crops and grassland, Great Britain 1983 - 2004**





B2.1.2 PHOSPHATE AND POTASH USE

Annual overall rates of phosphate and potash on tillage crops and on grassland since 1983 are illustrated in Figure B2.1(b), using the data presented in Table B2.2. Overall rates of phosphate and potash applied to tillage crops were approximately double those used on grassland.

Table B2.2 Overall phosphate and potash application rates (kg/ha), Great Britain 1983 - 2004

	tillage crops		*grass*		*all crops and grass*	
	phosphate	*potash*	*phosphate*	*potash*	*phosphate*	*potash*
1983	55	60	28	29	40	43
1984	62	68	26	33	42	49
1985	58	64	25	32	41	48
1986	57	62	23	33	40	47
1987	58	64	24	33	40	48
1988	56	63	23	31	39	47
1989	54	62	24	34	39	48
1990	53	64	25	36	39	49
1991	54	63	23	34	38	49
1992	53	61	21	28	36	44
1993	51	60	21	28	34	43
1994	53	63	24	31	38	46
1995	53	61	24	31	37	45
1996	52	61	23	30	36	44
1997	55	67	25	35	39	50
1998	51	64	21	29	35	46
1999	45	57	20	28	32	42
2000	47	55	20	26	32	40
2001	43	52	19	24	29	37
2002	44	57	20	25	31	40
2003	40	54	16	22	28	36
2004	41	55	17	22	28	37

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, 53 kg/ha in 1993-97 to 46 kg/ha for the period 1998-2002. The 2003 rate of 40 kg/ha was the lowest since Great Britain records began in 1983.

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 16 kg/ha in 2003, 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 18 kg/ha for the period 2003-04.

Overall potash use on tillage crops had declined slightly between 1983 and 1997, with a five-year mean of 64 kg/ha in 1983-87, 63 kg/ha in 1998-1992, 62 kg/ha in 1993-1997. There was larger drop to 57 kg/ha for the period 1998-2002. The overall application rate appeared to recover in 1997, but then dropped each year to a low of 52 kg/ha in 2001, it has recovered slightly since then. The 2001 value is the lowest level recorded since 1983 and represents a 23% fall from the peak value of 68 kg/ha in 1984. Like phosphate use on tillage, the 2001 level was associated principally with a higher proportion of spring barley, which has a lower fertiliser requirement.

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 2003. 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 in 1989-91 and in 1997. Annual potash use between 1998-2002 has been consistently lower (mean: 26 kg/ha) than in earlier years and the value of 22 kg/ha in 2003 and 2004 represents the lowest values recorded since 1983.

B2.1.3 FERTILISER USE ON MAJOR TILLAGE CROPS

Overall application rates of total nitrogen, phosphate and potash on the main arable crops in Great Britain since 1983 are shown in Figure B2.2.

Nitrogen

Between 1983-87 the five year mean for winter wheat was 189 kg/ha. Over the following five years it declined to 185 kg/ha, increasing to 188 kg/ha for the period 1993 to 1997 and dropping slightly to 187 kg/ha in 1998-2002. The rates of 197 kg/ha in 2003 and 2004 (Figure B2.2(a)) are the highest recorded since 1983. For winter barley the mean since 1988 has settled at about 10 kg/ha less than the peak of 153 kg/ha in 1983-87. For spring barley the mean for the 1998-2002 five year period at 104 kg/ha is higher than each of the previous five years cycles (99, 92 and 95 kg/ha) and the values in the new millennium are the highest since records started in 1983.

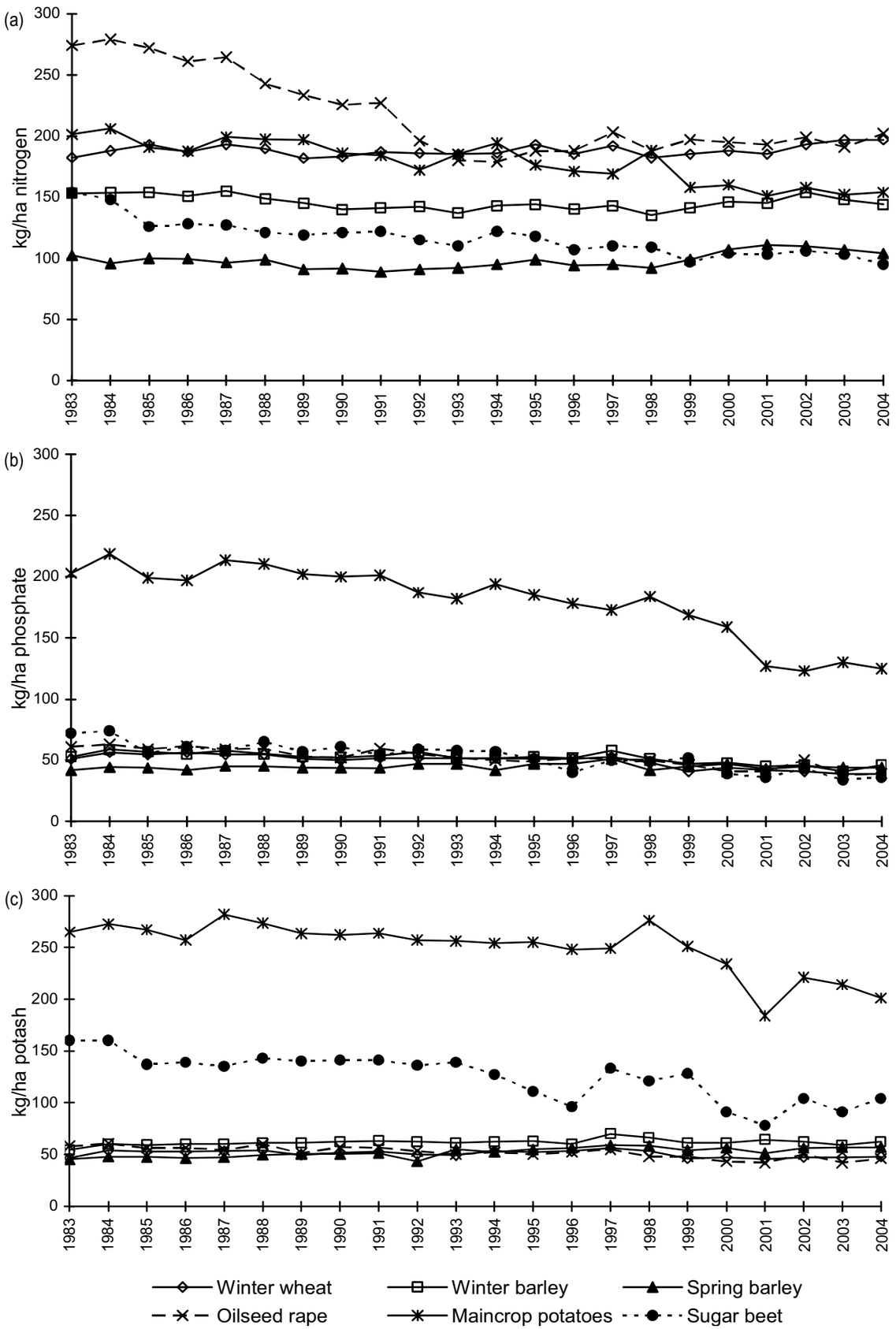
Nitrogen use on oilseed rape decreased between 1984 and 1994 and then showed a slight recovery. Before 1992, this change was mainly caused by reductions in autumn-applied nitrogen, as a result of cutbacks in both area treated and average rate. Between 1992 and 1994 the decreases in total nitrogen use resulted from reduced autumn and spring nitrogen recommendations for oilseed rape. This reflected economic change associated with the introduction of Arable Area Payments, and a temporary increase in the proportion of spring-sown crops, which have a lower nitrogen requirement than winter oilseed rape. After reaching a low of 179 kg/ha in 1994 rates have tended to fluctuate between 188 kg/ha and 203 kg/ha, mean usage for the period 1993-1997 was 188 kg/ha compared with 194 kg/ha for 1998-2002. The value of 202 kg/ha in 2004 is the highest since 1997.

Since the early 1980s, overall nitrogen use on maincrop potatoes has tended to decrease, despite some large variability in estimated annual rates; mean usage was 197, 187, 179 and 163 kg/ha for the periods 1983-1987, 1988-1992, 1993-1997 and 1998-2002 respectively. Sugar beet has also experienced a decline (137, 120 113 and 104 kg/ha) over the same periods. Mean rates of 153 kg/ha for maincrop potatoes and 99 kg/ha for sugar beet for 2003-2004 continue the decline. The trend towards less nitrogen use on sugar beet reflects greater industry and farmer awareness about the adverse effects of unnecessarily high nitrogen input on sugar yield, related to the formation of high concentrations of amino-nitrogen compounds in the roots.

Phosphate and potash

Overall application rates of phosphate have gradually declined on winter wheat and, less consistently, on winter barley since the mid 1980s (Figure B2.2(b)); 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 has continued with a fall to 39 and 44 kg/ha for winter wheat and winter barley respectively for the 2003-2004 period. In contrast, however, phosphate use has risen 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 42, 133 and 38 in the new millennium.

Figure B2.2 **Overall application rates (kg/ha) of (a) total nitrogen, (b) phosphate and (c) potash on major arable crops, Great Britain 1983 - 2004**



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, 233 and 104 kg/ha for the 1998-2002 period. Rates in 2003 and 2004 suggest the downward trend is continuing (mean: 45, 211, 94 kg/ha).

Much of the 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.

B2.1.4 AUTUMN AND WINTER APPLICATIONS OF NITROGEN FERTILISER

In 1985 about two thirds of the winter cereals and nearly 90% of winter oilseed rape received autumn and early winter nitrogen. Since that time the area has decreased considerably in England & Wales and to a lesser extent in Scotland. For cereals the dressing cover is now less than 5% in England & Wales (Table B2.3). There was a large reduction in 2003 in Scotland which meant it reduced to less than 50% on both crops for the first time, but it increased again in 2004. The Great Britain values have now fallen below 10% for both crops. This reduction is in keeping with the standard advice that autumn nitrogen is not required for winter cereals, as economic yield benefits are rare and autumn-applied nitrogen is vulnerable to leaching loss. In Scotland some farmers still consider that autumn-applied nitrogen reduces the risk of poor establishment of winter cereal crops under the colder and wetter conditions in that part of Britain. The area receiving autumn nitrogen is now too low for data relating to average field application to be used.

In England & Wales the proportion of winter oilseed rape dressed with autumn-winter applied nitrogen fell rapidly between 1985 and 1989 down to about a half, but showed little further change until 1997/98, when it dropped to one third of the crop area. The proportion in Scotland is higher although with the low number of crops in the sample the values for 2001 onwards should be treated with caution. The average field rate for England & Wales was 49 kg/ha in 1985-89, 43 kg/ha in 1990-94, 38 kg/ha in 1995-99 and 44 kg/ha in 2000-04. 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. However, the economic benefits are usually small and this is reflected in current fertiliser practice.

The survey results may be taken to indicate the implementation of good agronomic and environmental practice by arable farmers in response to their awareness of research findings and advisory recommendations.

Table B2.3 Dressing cover (% area) of autumn or winter-applied (August to January) nitrogen on winter cereals and winter oilseed rape by region, 1999 - 2004 and average application rate (kg/ha) for winter oilseed rape.

Winter cereals - dressing cover (%)

	England & Wales		*Scotland*		*Great Britain*	
	winter wheat	*winter barley*	*winter wheat*	*winter barley*	*winter wheat*	*winter barley*
1999	5	6	35	54	6	10
2000	6	6	35	45	7	11
2001	5	5	32	64	7	14
2002	5	8	38	64	8	16
2003	4	4	20	46	5	9
2004	4	4	35	54	6	9

Winter oilseed rape — dressing cover and application rate

	England & Wales		*Scotland*		*Great Britain*	
	dressing cover	*application rate*	*dressing cover*	*application rate*	*dressing cover*	*application rate*
1999	32	42	72	45	35	43
2000	36	43	55	38	33	42
2001	36	44	91[a]	39	43	43
2002	37	51	80[a]	31	41	47
2003	36	40	87[a]	37	42	39
2004	32	41	78[a]	35	35	40

[a] Only a small number of fields in the sample

B2.2 LONGER TERM TRENDS FOR ENGLAND AND WALES

The earlier surveys for England & Wales, which together now account for around 83% (8.6 million ha) of the agricultural land in Britain, provide a longer time series than for Great Britain, based on the present survey design.

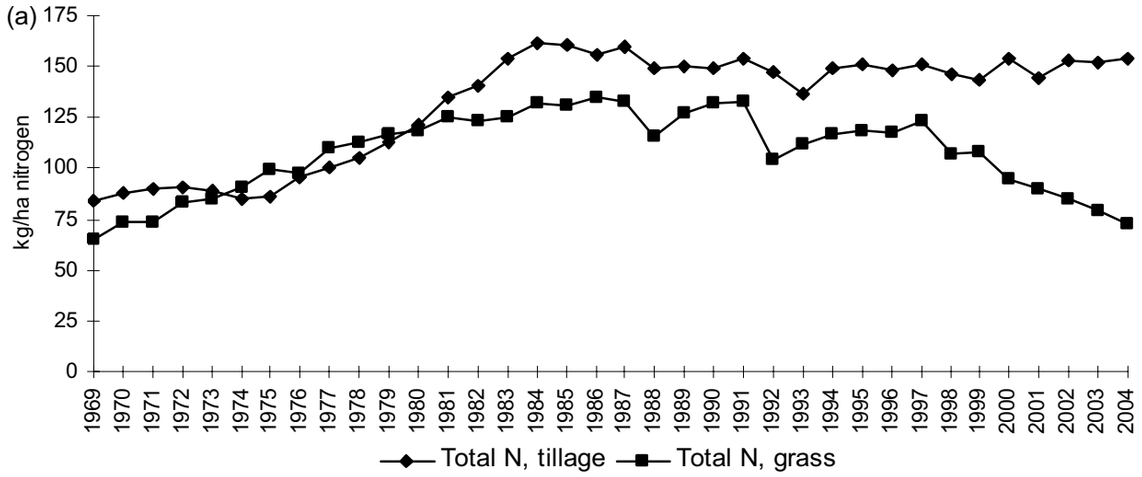
B2.2.1 NITROGEN USE

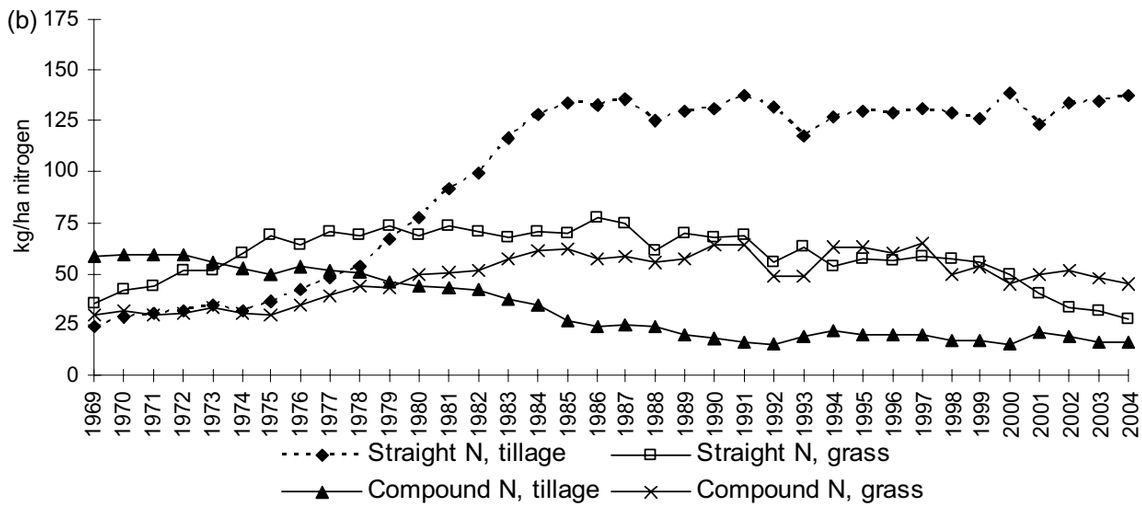
The falls in nitrogen use on tillage crops (Figure B2.3(a)) in the 1988, 1999 and 2001 seasons can be largely attributed to the reduced cropping areas of winter cereal and winter oilseed rape due, except for oilseed rape in 1999, to very wet autumns which restricted drilling opportunities. For example in England in 2001 there was a 46% increase in the area of spring barley grown compared with the previous season. The large drop in nitrogen use on tillage crops in 1993 also resulted from a fall in the proportion of the total tillage area cropped with cereals and oilseed rape. This was caused by the introduction of the Arable Area Payment Scheme (AAPS) and widespread adoption of rotational set-aside on arable farms. This scheme halved the commodity price for oilseed rape, thereby reducing the optimum economic fertiliser nitrogen rate for this crop. A big increase in spring instead of winter oilseed rape cropping, in response to rape seed price reductions under the AAPS, was a further contributory factor to the drop in nitrogen use on tillage crops in 1993.

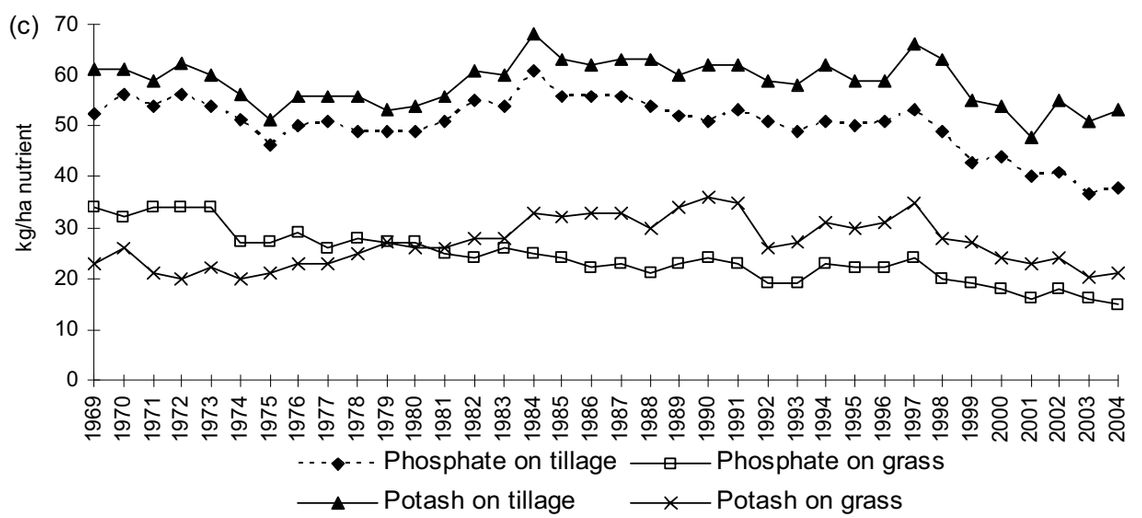
The sharp drop in nitrogen use on grassland in both 1988 and 1992 may have partly reflected the influence of seasonal weather pattern on grass growth and related nitrogen requirements. The increased use of fertiliser nitrogen on grassland during the 1980s had been accentuated by its high cost/benefit ratio, reliability in producing a consistent response and its potential to support high stocking rates and high output. Nitrogen recommendations for grassland were reduced in the early 1990s, in light of further research findings, which could also partly account for the lower use of nitrogen in recent years. The further large fall in nitrogen use which started in 1998 is associated with an ongoing reduction in livestock numbers, especially in the dairy sector. Increasing use of extended grazing practice on dairy farms, with consequently smaller silage requirements for winter feeding, may also have been a contributory factor to the reduction in nitrogen use on grassland. In 2001 Foot and Mouth had a major impact on livestock numbers, the North, West and South West were particularly badly affected. There was an average of 10% reduction in the dressing cover in these areas with a 5% reduction for England & Wales as a whole compared with the previous year. Nitrogen application rates to grass in 2004 were the lowest since the early 1970s and are probably related to the ongoing reduction in the dairy herd (numbers in England have fallen by 4% since 2003).

Most nitrogen fertiliser on tillage crops in England & Wales is now applied in straight form following the large steady increase in straight nitrogen application rate which occurred between 1975 and 1985, combined with a decrease in compound nitrogen use between 1970 and 1992 (Figure B2.3(b)). The use of straight nitrogen has largely determined the changes in total nitrogen rate on tillage crops since 1969. On grassland, however, use of compound nitrogen increased between 1975 and 1990, while straight nitrogen use remained fairly static. Since 1998 use of straight N on grass has declined reaching, in 2004, the lowest level since current records began in 1969.

Figure B2.3 **Overall application rates (kg/ha) of (a) total nitrogen, (b) straight and compound nitrogen and (c) phosphate and potash on tillage crops and grassland, England & Wales 1969 - 2004**







B2.2.2 PHOSPHATE AND POTASH USE

Overall application rates of phosphate and potash on tillage crops have shown a broadly similar pattern of annual changes in use, over the last thirty years (Figure B2.3.(c)). The mean rates for phosphate were 52, 54, and 50 kg/ha during the 1970s, 1980s and 1990s. For potash the equivalent figures were 57, 61 and 61 kg/ha. The falls in overall phosphate and potash use over the last five years, mean that in 2004 application rates were at, or close to, the lowest recorded levels since 1969.

Overall phosphate use on grassland slowly but steadily declined from 34 kg/ha in 1969, to 19 kg/ha 1992, then recovered slightly before dropping back to 19 kg/ha in 1999. Levels continued to decline into the 2000s and, at 15 kg/ha, reached their lowest recorded level in 2004. The mean rates for phosphate were 30, 24, and 22 kg/ha during the 1970s, 1980s and 1990s, and 17 kg/ha over the last five years.

Insoluble phosphate fertilisers, such as basic slag or ground rock phosphate, were still commonly used on grassland in the early 1970s, at application rates which may have supplied relatively large amounts of total phosphate. Since then, phosphate inputs have been largely based on fertiliser products containing water soluble phosphate, which may partly explain the decline observed in the overall application rate.

In contrast, the overall rate of potash on grassland gradually increased with a mean rate of 23, 30 and 31 kg/ha during the 1970s, 1980s and 1990s. Rates have declined in the 2000s with the mean for the first five years at 22 kg/ha.

B2.3 LONGER TERM TRENDS FOR SCOTLAND

Overall rates for total nitrogen, phosphate and potash use on tillage crops and on grassland since 1983, the first year that the Survey was undertaken in Scotland, are presented in Figure B2.4. The trends differ from those for England & Wales over the same timescale.

B2.3.1 NITROGEN USE

Recorded annual overall rates of total nitrogen on both grass and tillage crops in Scotland tended to fluctuate during 1983-88 and 1995-2001, but were relatively stable in the intervening years (Figure B 2.4 (a)), since 2001 rates have declined. Total nitrogen rates on tillage crops in Scotland were much lower than those in England & Wales during the 1980s. This was largely because of differences in cropping practice and associated nitrogen requirement; malting spring barley and mixed rotations are more common in Scotland than in England & Wales, where winter wheat and oilseed rape are grown on a much higher proportion of the total tillage area. However during the 2000s there has been a change to more winter barley at the expense of spring and this is now reflected in the nitrogen inputs as the rates in Scotland have increased relative to those in England. In 2001 the rate of 147 kg/ha was the highest level since records began in 1983 and was greater than the rate used in England & Wales (Figure B2.5(a)).

Before 1985, more nitrogen was applied to tillage crops in compound than in straight form (Figure B2.4(b)). Subsequently, about 60-65% of the total nitrogen input for tillage crops has been applied in straight form, in 2002 this increased temporarily to 70%; the corresponding proportion in England & Wales is nearly 90%. Compound nitrogen has consistently been the main form of nitrogen fertiliser used on grassland, with relatively little change in application rate since 1983, apart from a marked drop in 1996 and higher recorded usage in 1997-99, compared to earlier years. Straight nitrogen use has decreased since the late 1980s, down to about one quarter of the total nitrogen input on grassland in recent years.

Figure B2.4 **Overall application rates (kg/ha) of (a) total nitrogen, (b) straight and compound nitrogen to grassland, and (c) phosphate and potash on tillage crops and grassland, Scotland 1983 - 2004**

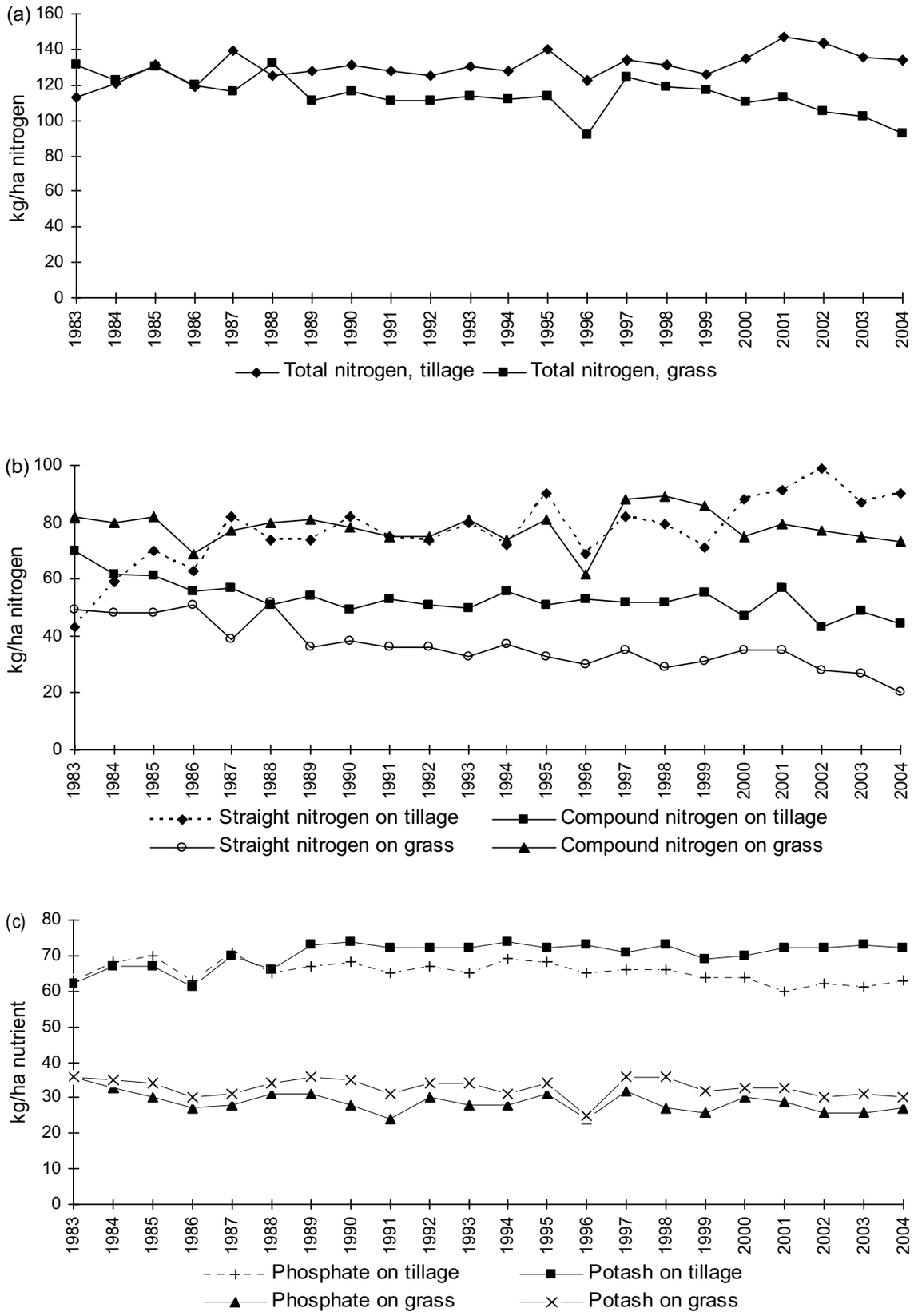
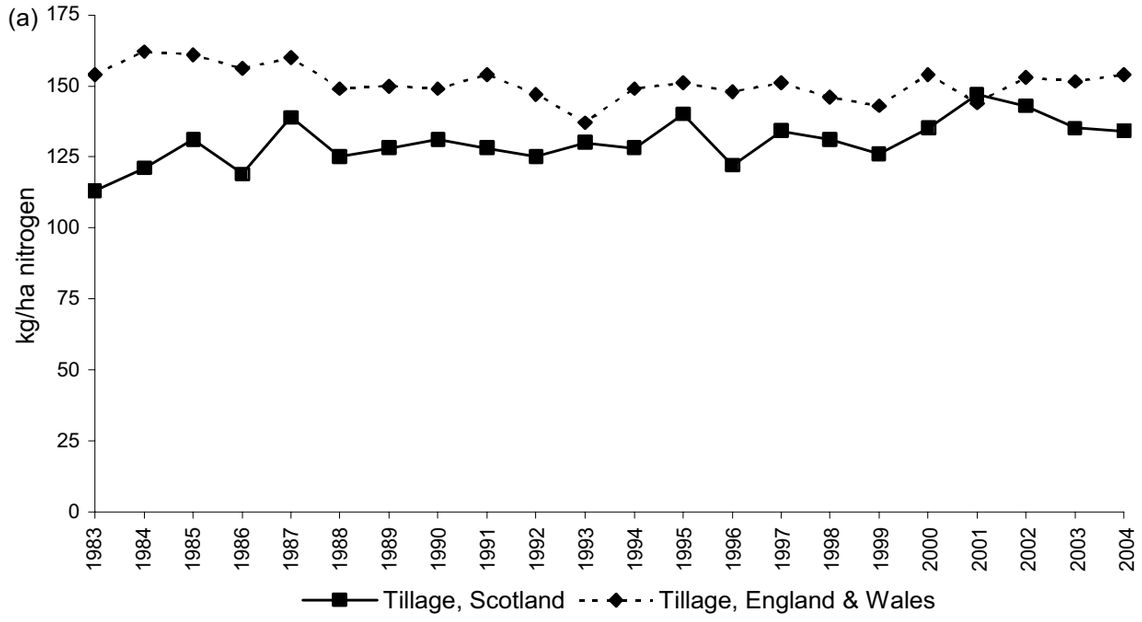
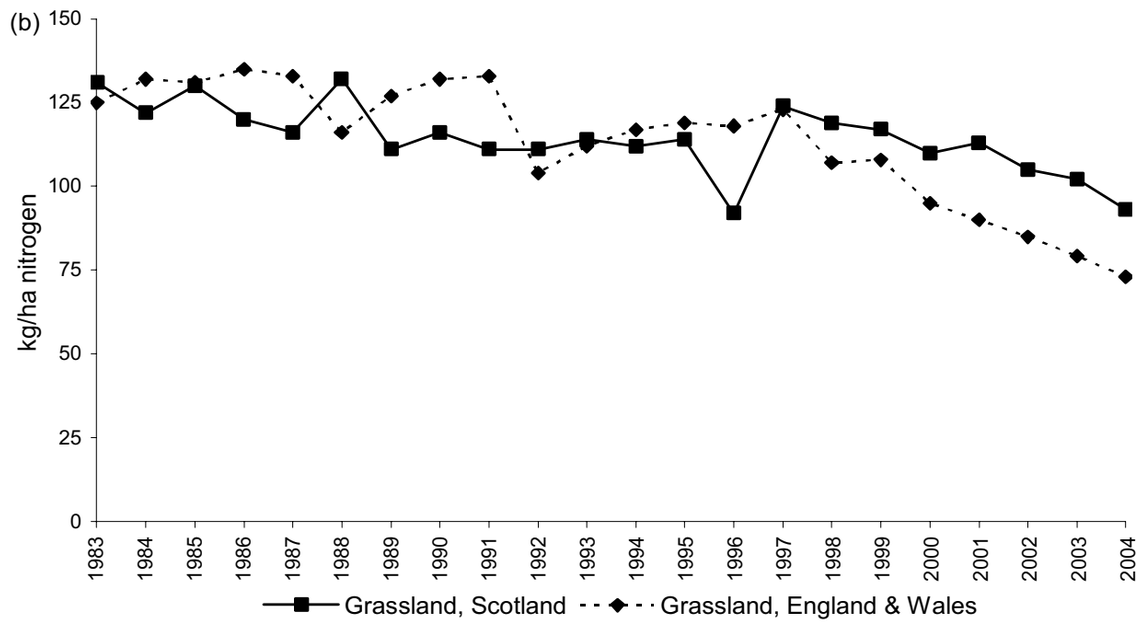


Figure B2.5 **Overall application rates (kg/ha) of (a) total nitrogen to tillage crops, and (b) total nitrogen to grassland in Scotland and in England & Wales 1983 - 2004**





B2.3.2 PHOSPHATE AND POTASH USE

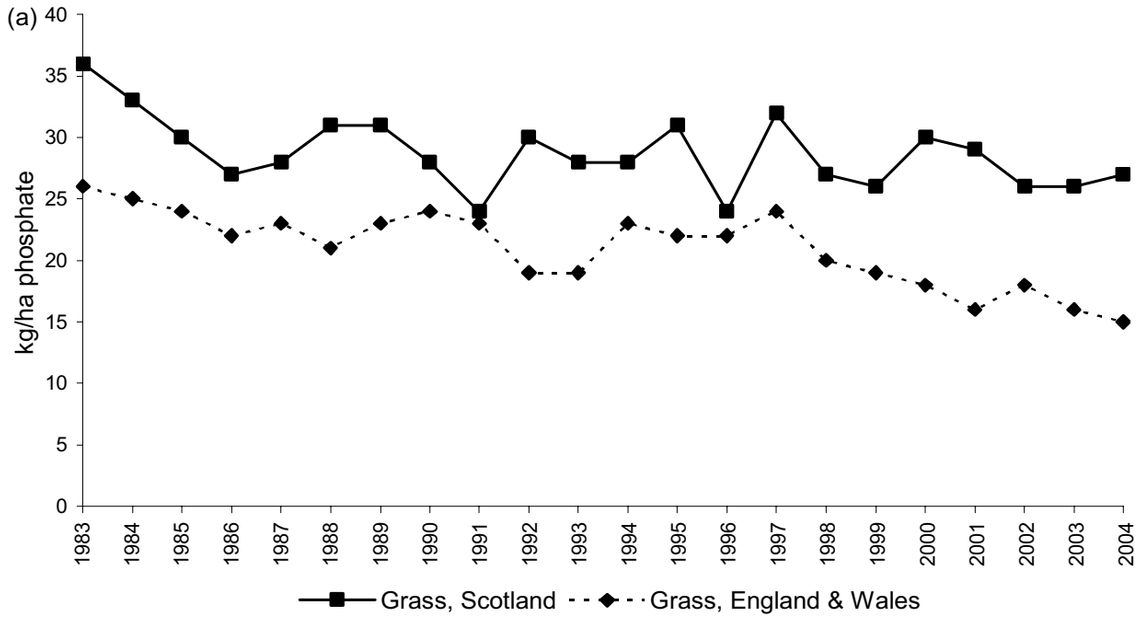
Overall rates of phosphate and potash on tillage crops tended to fluctuate between 1983 and 1988 but have been relatively stable since 1989 (Figure B2.4(c)) with an average of 65 kg/ha for phosphate and 72 kg/ha for potash.

Overall application rates of phosphate to tillage crops are higher in Scotland (Figure B2.6(a)) and the difference has increased over the last six years as rates have fallen significantly in England & Wales. Potash rates were very similar in both countries between 1983-88 (Figure B2.6(b)). Between 1989 and 1996 about 10 kg/ha more potash was applied in Scotland. As with phosphate this difference has increased in recent years as rates in England & Wales have declined.

Overall rates of phosphate and potash on grassland declined from 1983 to 1986. Since then rates have fluctuated from year to year but the average has remained fairly static at around 28 kg/ha for phosphate and 33 kg/ha for potash. Phosphate applications to grass in England & Wales have been consistently lower (Figure B2.7(a)). For grassland rates of potash were generally similar until 1997, since then rates in England & Wales have declined more rapidly than those in Scotland (Figure B2.7(b)).

Figure B2.6 **Overall application rates (kg/ha) of (a) phosphate and (b) potash to tillage crops in Scotland and in England & Wales 1983 - 2004**

Figure B2.7 **Overall application rates (kg/ha) of (a) phosphate and (b) potash to grassland in Scotland and in England & Wales 1983 - 2004**



SECTION C - TABLES

CONTENTS

GREAT BRITAIN TABLES 2004

ENGLAND AND WALES TABLES 2004

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 2004

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 2004

	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	47	26	145	50	63	108	21	29	52
Winter wheat	99	61	61	15	199	63	78	197	39	48	2055
Spring barley	98	84	87	26	106	53	65	104	44	57	792
Winter barley	99	74	78	18	145	61	79	144	46	62	628
Oats	90	71	70	21	108	58	73	97	41	51	174
Rye/Triticale/Durum wheat	56	42	47	47	116	61	78	65	26	37	34
Seed potatoes	91	91	91	24	122	177	208	111	161	189	21
Early potatoes	100	100	100	20	167	162	245	167	162	245	8
2nd Early/Maincrop potatoes	97	86	87	29	158	146	231	154	125	201	144
Sugar beet	92	51	80	25	103	71	130	95	36	104	192
Spring oilseed rape	100	61	58	15	136	66	72	136	41	42	87
Winter oilseed rape	99	63	65	13	211	61	72	210	39	46	437
Linseed	74	40	42	15	81	49	53	60	19	22	31
Forage maize	83	68	54	90	61	60	82	51	41	45	152
Rootcrops for stockfeed	91	85	86	77	96	108	102	87	92	88	69
Leafy forage crops	63	68	68	62	137	43	73	86	29	50	39
Arable silage/Other fodder crops	62	58	62	67	88	35	44	54	21	27	38
Peas - human consumption	4	43	47	7	67	63	64	3	27	30	55
Peas - animal consumption	7	32	39	7	30	57	73	2	18	29	102
Beans - animal consumption	11	40	44	7	35	59	72	4	23	32	182
Vegetables (brassicae)	98	86	91	15	197	71	137	193	61	125	32
Vegetable (other)	78	81	82	14	105	77	129	82	63	106	58
Soft fruit	99	99	78	2	63	59	38	63	58	30	21
Top fruit	85	46	57	0	53	36	90	45	16	51	54
Other tillage	34	24	34	8	77	48	96	26	12	33	67
All tillage	91	65	67	19	166	63	82	152	41	55	5524
Grass under 5 years old	85	69	71	42	142	38	56	120	26	40	1092
Grass 5 years and over	67	57	57	38	101	27	33	68	16	19	2724
All grass	70	59	59	39	109	29	38	77	17	22	3816
All crops and grass	80	61	63	30	138	45	59	110	28	37	9340

Source: British Survey of Fertiliser Practice 2004

Table GB1.2 Use of straight fertiliser, Great Britain 2004

	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	69	0	4	138	0	87	94	0	4	52
Winter wheat	95	5	8	195	79	91	186	4	7	2055
Spring barley	68	0	4	87	75	85	59	0	4	792
Winter barley	89	3	7	140	83	88	125	3	6	628
Oats	74	2	5	111	72	91	82	1	4	174
Rye/Triticale/Durum wheat	45	0	6	115	0	86	52	0	5	34
Seed potatoes	7	0	10	80	0	207	6	0	20	21
Early potatoes	60	8	8	105	126	251	64	10	21	8
2nd Early/Maincrop potatoes	49	0	17	101	0	200	49	0	35	144
Sugar beet	84	2	33	102	105	136	85	2	45	192
Spring oilseed rape	92	5	4	130	67	106	119	4	4	87
Winter oilseed rape	97	4	10	202	87	90	197	4	9	437
Linseed	67	0	2	77	0	60	51	0	1	31
Forage maize	34	0	18	71	0	105	24	0	19	152
Rootcrops for stockfeed	20	0	4	123	0	155	24	0	6	69
Leafy forage crops	38	0	0	49	0	0	19	0	0	39
Arable silage/Other fodder crops	24	0	4	110	0	74	26	0	3	38
Peas - human consumption	2	5	9	87	90	57	1	4	5	55
Peas - animal consumption	5	6	14	30	60	80	2	4	11	102
Beans - animal consumption	5	5	9	58	91	90	3	4	8	182
Vegetables (brassicae)	78	0	0	93	0	0	72	0	0	32
Vegetable (other)	69	1	9	95	130	120	65	1	11	58
Soft fruit	66	57	21	66	70	113	43	40	23	21
Top fruit	71	24	37	59	36	109	42	9	41	54
Other tillage	26	0	8	79	0	148	21	0	13	67
All tillage	80	4	9	164	78	101	132	3	9	5524
Grass under 5 years old	41	0	2	120	0	104	50	0	2	1092
Grass 5 years and over	22	0	0	103	0	0	22	0	0	2724
All grass	25	0	1	107	0	95	27	0	1	3816
All crops and grass	49	2	4	148	77	101	73	1	4	9340

Source: British Survey of Fertiliser Practice 2004

Table GB1.3 Use of compound fertiliser, Great Britain 2004

	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	26	41	45	53	50	56	14	21	26	52
Winter wheat	18	56	54	63	62	74	11	35	40	2055
Spring barley	69	83	84	66	53	64	45	44	53	792
Winter barley	29	71	72	66	60	77	19	43	56	628
Oats	23	69	68	63	57	69	15	40	47	174
Rye/Triticale/Durum wheat	15	42	44	85	61	70	13	26	31	34
Seed potatoes	91	91	81	116	177	208	105	161	169	21
Early potatoes	92	92	92	113	165	245	103	152	224	8
2nd Early/Maincrop potatoes	80	86	76	131	146	218	105	125	167	144
Sugar beet	15	49	51	64	70	116	10	34	59	192
Spring oilseed rape	23	56	55	75	66	69	17	37	38	87
Winter oilseed rape	26	60	56	49	59	67	13	35	37	437
Linseed	14	40	40	64	49	53	9	19	21	31
Forage maize	68	68	37	40	60	69	27	41	26	152
Rootcrops for stockfeed	77	85	83	81	108	100	63	92	82	69
Leafy forage crops	57	68	68	118	43	73	68	29	50	39
Arable silage/Other fodder crops	47	58	58	61	35	42	28	21	25	38
Peas - human consumption	3	38	38	56	59	66	2	22	25	55
Peas - animal consumption	2	26	26	27	55	66	1	14	17	102
Beans - animal consumption	6	35	37	12	55	64	1	19	23	182
Vegetables (brassicae)	91	86	91	132	71	137	121	61	125	32
Vegetable (other)	21	80	79	79	77	120	17	62	95	58
Soft fruit	77	77	58	25	24	11	20	18	6	21
Top fruit	30	22	34	11	36	30	3	8	10	54
Other tillage	11	24	26	51	48	79	5	12	20	67
All tillage	29	61	60	67	62	77	20	38	46	5524
Grass under 5 years old	66	57	56	107	27	32	71	15	18	1092
Grass 5 years and over	56	68	70	82	38	54	46	26	38	2724
All grass	57	59	59	87	29	37	50	17	22	3816
All crops and grass	45	60	59	81	44	55	37	26	32	9340

Source: British Survey of Fertiliser Practice 2004

Table GB1.4 Use of lime, Great Britain 2004

	Crop area receiving dressing (%)						Average field rate of CaO equivalent (tonnes/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	-	-	-	-	-	-	-	-	-	-	-	-	1	52
Winter wheat	3.8	1.2	0.4	0.3	0.4	6.1	4.2	4.3	4.5	8.2	0.7	4.4	117	2055
Spring barley	6.6	0.1	3.5	0.1	1.0	11.3	4.5	5.8	4.1	6.3	20.7	5.9	104	792
Winter barley	5.5	0.6	1.2	0.5	0.6	8.4	4.1	3.7	4.6	4.6	2.6	4.2	59	628
Oats	0.7	1.5	1.5	-	0.2	4.0	4.6	5.1	5.0	-	0.2	4.7	10	174
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	4	34
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	21
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	1	144
Sugar beet	9.7	2.1	1.4	8.9	4.7	26.7	4.8	4.4	2.9	7.8	5.0	5.7	53	192
Spring oilseed rape	4.4	0.8	5.1	0.6	-	10.9	3.7	5.0	4.7	4.9	-	4.4	8	87
Winter oilseed rape	7.5	1.3	1.8	0.6	1.7	12.9	4.1	3.7	4.9	7.7	2.6	4.2	39	437
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	3	31
Forage maize	12.6	2.7	0.6	0.2	0.4	16.6	4.3	4.9	3.7	4.9	8.2	4.5	36	152
Rootcrops for stockfeed	6.6	-	2.8	1.1	1.2	11.7	4.0	-	4.9	4.7	4.9	4.4	11	69
Leafy forage crops	8.9	-	4.9	-	-	13.8	4.9	-	4.9	-	-	4.9	7	39
Arable silage/Other fodder crops	12.3	-	5.2	-	-	17.5	5.4	-	5.9	-	-	5.6	9	38
Peas - human consumption	3.1	5.6	2.5	-	-	11.2	8.0	1.7	4.5	-	-	4.1	8	55
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	102
Beans - animal consumption	1.9	1.9	-	-	0.6	4.4	3.0	2.9	-	-	0.5	2.6	11	182
Vegetables (brassicae)	11.0	-	2.1	-	-	13.0	4.4	-	3.0	-	-	4.2	5	32
Vegetable (other)	0.4	8.8	-	-	13.8	23.0	4.9	4.6	-	-	3.1	3.1	15	58
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	21
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	2	54
Other tillage	2.0	-	1.0	-	2.9	5.9	2.5	-	0.3	-	6.2	4.0	5	67
All tillage	4.9	1.1	1.2	0.6	0.9	8.7	4.2	4.1	4.6	7.5	7.1	4.9	511	5524
Grass under 5 years old	4.6	0.1	1.4	-	1.5	7.5	4.4	3.7	3.7	-	3.2	4.0	104	1092
Grass 5 years and over	1.8	-	0.8	0.1	0.5	3.2	6.3	4.2	4.4	5.4	4.2	5.5	134	2724
All grass	2.3	-	0.9	-	0.7	4.0	5.6	4.1	4.2	5.4	3.8	5.0	238	3816
All crops and grass	3.5	0.5	1.0	0.3	0.8	6.1	4.8	4.1	4.4	7.3	5.6	4.9	749	9340

Source: British Survey of Fertiliser Practice 2004

Table GB2.1 Average fertiliser practice by grassland utilisation, Great Britain 2004

	Crop area receiving dressing (%)				Average field rate (kg/ha)			Overall application rate (kg/ha)			Fields in sample
	N	P_2O_5	K_2O	FYM	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Grazed not mown	63	54	52	27	95	26	27	60	14	14	1880
Grazed mown	83	69	72	62	125	33	48	104	23	34	1557
All grazings	70	59	59	39	107	29	36	75	17	21	3437
Cut for silage - grazed	88	75	79	69	134	35	51	119	26	40	1141
Cut for silage - not grazed	87	69	80	57	155	42	68	135	29	54	246
All cut for silage	88	74	79	67	137	36	53	121	26	42	1387
Cut for hay - grazed	66	51	50	39	91	28	36	60	14	18	463
Cut for hay - not grazed	71	41	46	34	88	30	33	63	13	15	92
All cut for hay	67	49	50	39	91	29	36	61	14	18	555
All mowings	83	68	72	60	127	34	50	106	23	36	1876
All grass	70	59	59	39	109	29	38	77	17	22	3816

Source: British Survey of Fertiliser Practice 2004

Table GB3.0 Product and nutrient by month of application, Great Britain 2004

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product (000 tonnes)
Straight N	1	0	0	0	0	6	29	38	18	4	3	1	2002
Straight P	24	14	6	3		9	19	7	6	0	3	9	35
Straight K	9	12	16	2	3	19	19	13	4	1	1	1	93
Compound	6	6	2	1	1	5	22	27	13	8	4	5	2386
All Fertilisers	4	3	1	1	1	6	25	32	15	6	3	3	4515

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient (000 tonnes)
N	1	0	0	0	0	5	28	37	17	6	4	2	1159
P_2O_5	11	10	3	2	1	7	22	23	10	4	2	6	294
K_2O	10	10	4	2	2	9	21	22	10	5	3	5	389
Total	4	4	1	1	1	6	25	31	15	6	3	3	1841

Note: Product use refers to the total tonnage of the products used by farmers in the survey year 2004;
nutrient use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5, and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2004

Table GB3.1 Product type as percentage of all product used by crop group, Great Britain 2004

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 spec	all grass	all crops and grass
Calcium Ammonium Nitrate	0.3	0.6	0.0	0.1	1.4	2.2	0.7	0.1	0.0	0.1	0.0	0.1	0.5
Urea	3.4	9.1	6.2	3.2	10.6	1.2	7.9	1.7	1.7	1.8	4.6	1.6	5.5
Ammonium Nitrate	24.8	45.1	4.8	20.8	40.9	16.5	37.8	20.8	25.5	18.6	27.9	20.8	31.3
Urea Ammonium Nitrate	3.3	10.3	2.9	2.7	13.6	1.3	8.8	0.2	0.4	0.2	0.0	0.2	5.5
Other Straight N	2.9	2.0	0.2	0.6	4.8	1.5	2.3	0.5	0.1	0.4	0.3	0.5	1.6
Triple Superphosphate	0.3	1.0	0.1	0.0	1.0	2.0	0.9	0.2	0.1	0.1	1.1	0.2	0.6
Single Superphosphate	0.0	0.0	0.0	1.8	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Other Straight P	0.0	0.1	0.0	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash	1.1	1.5	3.9	1.6	1.7	6.0	1.8	0.3	0.5	0.5	1.9	0.3	1.3
Other Straight K	0.1	0.3	0.8	23.6	0.2	1.7	1.3	0.1	0.0	0.1	0.0	0.1	0.8
NP	0.5	0.7	3.7	0.5	1.4	5.0	1.2	2.9	2.1	1.9	0.0	2.8	1.8
NK	2.1	2.2	0.0	1.2	1.8	2.6	2.0	6.1	5.4	12.4	0.0	7.0	3.9
PK	9.1	19.2	3.2	34.4	13.1	28.3	17.6	2.9	3.2	2.6	6.4	3.0	11.9
Very High N	6.3	2.6	0.7	0.5	0.8	4.0	2.7	35.6	22.5	29.9	33.8	34.6	14.9
High N	15.3	0.9	0.8	1.5	0.5	6.9	2.8	25.1	33.6	26.6	20.0	25.0	11.4
High P	0.7	0.4	0.3	0.0	0.4	2.2	0.5	0.0	0.0	0.0	0.0	0.0	0.3
High K	8.5	1.2	42.4	4.0	1.2	8.0	4.5	0.9	2.4	1.7	0.0	1.0	3.2
Low N	7.1	2.2	20.2	2.3	3.1	2.6	3.8	0.5	0.6	1.0	0.0	0.7	2.6
Low P	2.6	0.1	4.3	0.4	0.0	5.5	0.9	0.7	1.0	1.3	0.0	0.8	0.9
Equal NPK	11.7	0.4	5.6	0.6	3.2	1.8	2.4	1.4	1.0	0.8	4.1	1.3	2.0
Total Product ('000 tonnes)	**309**	**1717**	**138**	**105**	**362**	**150**	**2781**	**1583**	**142**	**788**	**8**	**1735**	**4515**

Source: British Survey of Fertiliser Practice 2004

Table GB3.2 Use of product type by crop group, Great Britain 2004

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 spec	all grass	total product (000 tonnes)
Calcium Ammonium Nitrate	4.3	45.0	0.0	0.4	23.8	15.2	88.8	10.5	0.2	2.8	0.0	11.2	22
Urea	4.2	63.3	3.5	1.4	15.6	0.7	88.6	10.7	1.0	5.6	0.1	11.4	247
Ammonium Nitrate	5.4	54.8	0.5	1.6	10.5	1.8	74.4	23.3	2.6	10.4	0.2	25.6	1413
Urea Ammonium Nitrate	4.1	71.3	1.6	1.1	19.9	0.8	98.9	1.1	0.3	0.7	0.0	1.1	248
Other Straight N	12.5	46.8	0.3	0.8	24.5	3.1	88.1	10.2	0.3	4.2	0.0	11.9	72
Triple Superphosphate	3.1	62.8	0.3	0.1	13.4	10.8	90.6	8.8	0.4	1.9	0.3	9.4	28
Single Superphosphate	0.0	0.0	0.0	54.5	0.0	0.0	54.5	45.5	0.0	0.0	0.0	45.5	3
Other Straight P	0.0	42.6	0.0	1.5	3.3	36.6	84.0	16.0	0.0	0.0	0.0	16.0	3
Muriate of Potash	6.0	45.1	9.4	2.9	11.0	15.8	90.2	8.6	1.1	6.7	0.3	9.8	57
Other Straight K	0.8	14.4	3.2	69.4	2.1	6.9	96.8	2.8	0.0	2.7	0.0	3.2	36
NP	1.9	15.4	6.3	0.6	6.4	9.3	40.0	57.6	3.7	19.0	0.0	60.0	80
NK	3.6	21.7	0.0	0.7	3.7	2.2	32.0	54.5	4.3	55.0	0.0	68.0	177
PK	5.2	61.0	0.8	6.7	8.8	7.9	90.5	8.6	0.8	3.8	0.1	9.5	539
Very High N	2.9	6.7	0.1	0.1	0.4	0.9	11.1	83.4	4.8	34.8	0.4	88.9	675
High N	9.2	3.2	0.2	0.3	0.4	2.0	15.3	77.4	9.3	40.9	0.3	84.7	513
High P	14.7	47.8	3.0	0.0	9.9	23.7	99.1	0.9	0.0	0.0	0.0	0.9	14
High K	18.3	14.7	40.9	3.0	3.1	8.4	88.2	10.3	2.3	9.6	0.0	11.8	143
Low N	18.8	32.4	23.9	2.1	9.5	3.3	90.0	7.1	0.7	6.6	0.0	10.0	116
Low P	20.3	6.3	15.1	1.0	0.4	21.1	64.2	27.6	3.5	25.6	0.0	35.8	39
Equal NPK	40.7	8.5	8.6	0.7	13.0	3.0	74.5	24.1	1.7	7.4	0.4	25.5	89
All Fertilisers	**6.8**	**38.0**	**3.0**	**2.4**	**8.0**	**3.4**	**61.7**	**34.9**	**3.2**	**17.4**	**0.2**	**38.3**	**4515**

Source: British Survey of Fertiliser Practice 2004

Table GB3.3 Product use by month of application, Great Britain 2004

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total Product (000 tonnes)
Calcium Ammonium Nitrate	0.0	5.3	31.4	44.4	12.4	0.0	4.0	0.7	0.0	0.0	0.0	1.7	22
Urea	0.0	7.7	27.8	38.4	17.0	3.8	4.4	0.1	0.5	0.2	0.0	0.2	247
Ammonium Nitrate	0.0	4.6	28.5	38.6	18.8	4.9	2.4	1.3	0.6	0.2	0.1	0.0	1413
Urea Ammonium Nitrate	0.3	8.6	31.1	38.2	15.9	2.3	1.7	1.0	0.7	0.3	0.0	0.0	248
Other Straight N	0.2	14.2	46.7	23.9	6.8	5.5	1.9	0.3	0.5	0.0	0.0	0.0	72
Triple Superphosphate	0.0	10.3	17.6	7.4	6.3	0.4	3.5	6.8	29.1	15.0	2.7	1.1	28
Single Superphosphate	0.0	0.0	19.7	0.0	6.5	0.0	0.0	0.0	0.0	17.6	36.9	19.3	3
Other Straight P	0.0	8.8	29.3	16.0	0.0	0.0	0.0	42.6	0.0	0.0	3.3	0.0	3
Muriate of Potash	3.3	17.4	24.7	18.1	6.2	1.0	0.1	1.5	3.9	14.0	7.8	2.0	57
Other Straight K	3.0	21.5	9.1	4.4	0.0	0.4	1.9	0.0	18.2	10.0	28.7	2.8	36
NP	0.0	8.5	42.8	29.2	9.6	3.2	2.4	1.2	1.5	1.5	0.0	0.0	80
NK	0.0	6.8	13.1	15.0	28.7	21.6	10.5	2.8	0.5	0.0	0.0	0.9	177
PK	3.6	11.0	14.2	5.1	3.9	0.9	0.6	6.9	20.3	21.6	8.4	3.6	539
Very High N	0.1	2.2	23.9	31.4	16.2	12.7	7.4	5.2	0.8	0.1	0.0	0.0	675
High N	0.1	2.9	20.1	41.1	19.1	8.2	4.6	2.0	0.7	1.2	0.1	0.0	513
High P	0.0	4.8	19.2	7.2	29.2	0.0	0.0	11.1	28.4	0.2	0.0	0.0	14
High K	0.0	6.1	35.7	48.9	6.4	0.5	0.0	0.5	1.0	0.9	0.0	0.0	143
Low N	0.0	3.7	32.6	30.0	4.0	0.7	1.3	7.2	12.3	7.2	0.9	0.0	116
Low P	0.0	2.8	20.5	40.8	16.1	13.9	0.2	4.2	0.5	1.2	0.0	0.0	39
Equal NPK	0.0	3.3	30.3	35.4	10.1	4.8	0.5	8.7	3.0	2.9	0.8	0.0	89
All Fertilisers	**0.6**	**5.8**	**25.2**	**31.7**	**15.0**	**6.0**	**3.4**	**3.0**	**3.8**	**3.5**	**1.5**	**0.6**	**4515**

Source: British Survey of Fertiliser Practice 2004

Table EW1.1 Total fertiliser use, England & Wales 2004

	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	73	33	40	30	147	47	59	107	16	23	40
Winter wheat	99	59	60	15	199	63	77	197	37	46	1855
Spring barley	97	72	78	21	108	45	62	105	32	49	395
Winter barley	99	72	76	19	140	59	78	139	42	59	526
Oats	91	66	66	21	110	59	76	100	39	50	131
Rye/Triticale/Durum wheat	56	40	45	45	116	60	79	65	24	35	30
Seed potatoes	-	-	-	-	-	-	-	-	-	-	1
Early potatoes	100	100	100	20	167	162	245	167	162	245	8
2nd Early/Maincrop potatoes	98	85	86	32	162	150	244	158	127	210	120
Sugar beet	92	51	80	25	103	71	130	95	36	104	192
Spring oilseed rape	100	57	54	15	131	64	70	131	36	38	75
Winter oilseed rape	99	61	62	13	211	61	73	209	37	45	382
Linseed	78	42	44	13	81	49	53	63	20	23	29
Forage maize	83	68	54	90	61	60	83	51	41	45	151
Rootcrops for stockfeed	82	67	71	74	113	81	111	93	54	79	33
Leafy forage crops	66	67	67	65	151	33	74	100	22	50	22
Arable silage/Other fodder crops	65	62	66	81	90	34	41	59	21	27	26
Peas - human consumption	5	46	50	8	67	63	64	3	29	32	49
Peas - animal consumption	7	31	39	7	29	57	73	2	18	28	99
Beans - animal consumption	11	39	44	7	32	59	72	3	23	32	179
Vegetables (brassicae)	98	85	91	13	197	70	136	193	60	123	28
Vegetable (other)	79	81	82	15	107	75	132	85	60	109	51
Soft fruit	99	99	77	0	65	60	37	65	59	28	16
Top fruit	85	46	57	0	53	36	90	45	16	51	54
Other tillage	34	24	34	8	77	48	96	26	12	33	67
All tillage	91	61	63	18	170	63	83	154	38	53	4559
Grass under 5 years old	83	64	69	49	151	36	58	126	23	40	724
Grass 5 years and over	65	54	54	41	99	26	32	65	14	17	2225
All grass	68	55	56	42	108	28	37	73	15	21	2949
All crops and grass	78	58	59	31	141	44	59	110	26	35	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.2 Use of straight fertiliser, England & Wales 2004

	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	66	0	4	144	0	75	95	0	3	40
Winter wheat	96	5	8	195	80	88	187	4	7	1855
Spring barley	68	1	6	98	75	83	67	1	5	395
Winter barley	89	4	8	137	83	86	122	3	7	526
Oats	82	2	6	112	72	91	91	2	5	131
Rye/Triticale/Durum wheat	45	0	7	114	0	86	52	0	6	30
Seed potatoes	-	-	-	-	-	-	-	-	-	1
Early potatoes	60	8	8	105	126	251	64	10	21	8
2nd Early/Maincrop potatoes	51	0	20	99	0	201	51	0	39	120
Sugar beet	84	2	33	102	105	136	85	2	45	192
Spring oilseed rape	94	6	4	130	67	106	122	4	5	75
Winter oilseed rape	97	4	10	204	87	90	198	4	9	382
Linseed	70	0	2	77	0	60	54	0	1	29
Forage maize	34	0	19	71	0	105	24	0	19	151
Rootcrops for stockfeed	40	0	8	127	0	155	51	0	12	33
Leafy forage crops	44	0	0	47	0	0	20	0	0	22
Arable silage/Other fodder crops	26	0	4	109	0	75	29	0	3	26
Peas - human consumption	2	5	10	87	90	57	1	5	6	49
Peas - animal consumption	5	6	15	30	60	80	2	4	12	99
Beans - animal consumption	5	5	9	53	91	90	3	5	8	179
Vegetables (brassicae)	77	0	0	92	0	0	71	0	0	28
Vegetable (other)	73	1	8	97	130	109	70	1	9	51
Soft fruit	70	60	22	66	70	113	46	42	25	16
Top fruit	71	24	37	59	36	109	42	9	41	54
Other tillage	26	0	8	79	0	148	21	0	13	67
All tillage	82	4	10	169	79	100	138	3	10	4559
Grass under 5 years old	47	0	2	129	0	106	60	0	2	724
Grass 5 years and over	22	0	0	104	0	0	23	0	0	2225
All grass	26	0	1	110	0	96	28	0	1	2949
All crops and grass	51	2	5	153	78	100	78	2	5	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.3 Use of compound fertiliser, England & Wales 2004

	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	18	33	38	62	47	54	11	16	21	40
Winter wheat	16	54	53	67	61	74	11	33	39	1855
Spring barley	49	71	72	78	44	60	38	32	43	395
Winter barley	23	68	69	74	58	76	17	39	53	526
Oats	12	64	63	74	58	70	9	37	44	131
Rye/Triticale/Durum wheat	15	40	42	85	60	70	13	24	30	30
Seed potatoes	-	-	-	-	-	-	-	-	-	1
Early potatoes	92	92	92	113	165	245	103	152	224	8
2nd Early/Maincrop potatoes	78	84	74	137	150	230	108	126	171	120
Sugar beet	15	49	51	64	70	116	10	34	59	192
Spring oilseed rape	14	51	49	68	64	67	9	32	33	75
Winter oilseed rape	22	57	53	53	58	68	11	33	36	382
Linseed	15	42	42	64	49	53	9	20	22	29
Forage maize	67	68	37	39	60	70	27	41	26	151
Rootcrops for stockfeed	54	67	63	78	81	105	42	54	67	33
Leafy forage crops	63	67	67	126	33	74	79	22	50	22
Arable silage/Other fodder crops	47	62	62	63	34	38	30	21	24	26
Peas - human consumption	3	41	41	56	59	66	2	24	27	49
Peas - animal consumption	2	25	25	27	54	65	1	14	16	99
Beans - animal consumption	5	34	36	12	55	64	1	19	23	179
Vegetables (brassicae)	91	85	91	134	70	136	122	60	123	28
Vegetable (other)	17	80	80	87	74	124	15	59	100	51
Soft fruit	76	76	55	25	23	6	19	17	3	16
Top fruit	30	22	34	11	36	30	3	8	10	54
Other tillage	11	24	26	51	48	79	5	12	20	67
All tillage	22	57	55	72	61	78	16	35	43	4559
Grass under 5 years old	62	63	68	106	36	56	66	23	38	724
Grass 5 years and over	53	53	54	78	26	31	42	14	17	2225
All grass	55	55	56	83	27	36	45	15	20	2949
All crops and grass	40	56	55	80	43	55	32	24	30	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.4 Use of lime, England & Wales 2004

	Crop area receiving dressing (%)						Average field rate of CaO equivalent (tonnes/ha)							
	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Ground limestone	Ground chalk	Magnesian limestone	Sugar beet lime	Other	All	Fields limed	Fields in sample
Spring wheat	-	-	-	-	-	-	-	-	-	-	-	-	0	40
Winter wheat	4.0	1.2	0.3	0.4	0.3	6.3	4.2	4.3	4.7	8.2	0.7	4.4	106	1855
Spring barley	4.9	0.2	0.9	0.1	1.2	7.4	4.5	5.8	3.7	6.3	33.1	9.1	33	395
Winter barley	4.8	0.7	0.8	0.5	0.7	7.5	3.7	3.7	4.4	4.6	2.6	3.9	45	526
Oats	-	-	-	-	-	-	-	-	-	-	-	-	4	131
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	3	30
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	1
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	8
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	1	120
Sugar beet	9.7	2.1	1.4	8.9	4.7	26.7	4.8	4.4	2.9	7.8	5.0	5.7	53	192
Spring oilseed rape	1.9	0.9	5.7	0.7	-	9.3	3.7	5.0	4.7	4.9	-	4.6	7	75
Winter oilseed rape	8.1	1.4	1.6	0.7	1.9	13.7	4.1	3.7	4.9	7.7	2.6	4.2	37	382
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	2	29
Forage maize	12.1	2.7	0.6	0.2	0.4	16.1	4.3	4.9	3.7	4.9	8.2	4.5	35	151
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	-	-	4	33
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	3	22
Arable silage/Other fodder crops	13.9	-	5.1	-	-	19.0	5.5	-	6.2	-	-	5.7	7	26
Peas - human consumption	3.3	6.0	0.8	-	-	10.1	8.0	1.7	3.6	-	-	3.9	5	49
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	99
Beans - animal consumption	1.9	1.9	-	-	0.6	4.5	3.0	2.9	-	-	0.5	2.6	11	179
Vegetables (brassicae)	11.6	-	2.2	-	-	13.8	4.4	-	3.0	-	-	4.2	5	28
Vegetable (other)	0.4	9.6	-	-	14.6	24.6	4.9	4.6	-	-	3.2	3.2	13	51
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	16
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	2	54
Other tillage	2.0	-	1.0	-	2.9	5.9	2.5	-	0.3	-	6.2	4.0	5	67
All tillage	4.7	1.2	0.7	0.6	0.9	8.2	4.1	4.1	4.9	7.5	7.9	5.0	384	4559
Grass under 5 years old	4.6	0.1	1.4	-	1.4	7.5	4.5	3.7	3.6	-	3.2	4.1	71	724
Grass 5 years and over	2.0	0.1	0.7	0.1	0.6	3.4	6.6	4.2	4.4	5.4	4.2	5.7	107	2225
All grass	2.4	0.1	0.8	0.1	0.7	4.0	6.0	4.1	4.2	5.4	3.9	5.2	178	2949
All crops and grass	3.4	0.6	0.8	0.3	0.8	5.9	4.8	4.1	4.5	7.3	6.0	5.1	562	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.5 Percentage of crop area by field application rate - N, England & Wales 2004

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	27	0	9	5	0	2	11	16	18	10	-	-	-	-	-	-	-	-	40
Winter wheat	1	0	1	3	4	3	6	11	18	24	13	7	4	2	2	1	1	-	1855
Spring barley	3	2	5	8	18	29	27	6	1	2	1	-	-	-	-	-	-	-	395
Winter barley	1	0	5	5	5	12	26	26	13	2	3	1	-	-	-	-	-	-	526
Oats	9	1	6	12	13	25	21	9	3	2	-	-	-	-	-	-	-	-	131
Rye/Triticale/Durum wheat	44	0	0	4	25	1	8	17	-	-	-	-	-	-	-	-	-	-	30
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Early potatoes	0	7	0	0	0	0	12	24	33	24	-	-	-	-	-	-	-	-	8
2nd Early/Maincrop potatoes	2	2	4	9	4	9	10	18	11	10	11	5	2	3	-	-	-	-	120
Sugar beet	8	3	12	5	15	29	15	9	1	1	0	1	-	-	-	-	-	-	192
Spring oilseed rape	0	2	2	11	14	18	15	17	10	6	5	-	-	-	-	-	-	-	75
Winter oilseed rape	1	0	0	2	2	3	3	10	15	27	18	6	8	2	1	1	-	-	382
Linseed	22	2	11	18	32	5	7	3	-	-	-	-	-	-	-	-	-	-	29
Forage maize	17	20	14	18	15	10	5	1	1	-	-	-	-	-	-	-	-	-	151
Rootcrops for stockfeed	18	0	11	27	3	13	2	7	8	9	0	0	0	0	2	-	-	-	33
Leafy forage crops	34	3	1	5	3	1	6	3	41	-	-	-	-	-	-	-	-	-	22
Arable silage/Other fodder crops	35	0	11	20	22	0	3	2	0	3	4	-	-	-	-	-	-	-	26
Peas - human consumption	95	0	0	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Peas - animal consumption	93	1	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99
Beans - animal consumption	89	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	179
Vegetables (brassicae)	2	0	0	4	0	5	21	9	7	10	24	9	7	0	2	-	-	-	28
Vegetable (other)	21	1	19	6	14	4	16	8	11	-	-	-	-	-	-	-	-	-	51
Soft fruit	1	3	14	60	22	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Top fruit	15	34	10	6	21	11	3	0	0	0	1	-	-	-	-	-	-	-	54
Other tillage	66	2	5	18	2	0	2	1	2	-	-	-	-	-	-	-	-	-	67
All tillage	9	2	3	5	6	8	10	11	12	15	9	4	3	1	1	1	-	-	4559
Grass under 5 years old	17	1	4	11	11	10	10	7	4	6	6	3	2	3	2	1	1	-	724
Grass 5 years and over	35	1	13	16	11	6	5	4	2	2	2	1	1	1	-	-	-	-	2225
All grass	32	1	12	15	11	6	6	4	2	3	2	1	1	1	1	-	-	-	2949
All crops and grass	22	1	8	11	9	7	8	7	7	8	5	3	2	1	1	-	-	-	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.6 Percentage of crop area by field application rate - P_2O_5, England & Wales 2004

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	67	3	19	9	1	0	0	1	-	-	-	-	-	-	-	-	-	-	40
Winter wheat	41	4	11	26	15	3	1	0	-	-	-	-	-	-	-	-	-	-	1855
Spring barley	28	17	21	27	7	1	0	0	-	-	-	-	-	-	-	-	-	-	395
Winter barley	28	5	16	32	14	4	0	0	-	-	-	-	-	-	-	-	-	-	526
Oats	34	8	14	25	16	4	0	0	-	-	-	-	-	-	-	-	-	-	131
Rye/Triticale/Durum wheat	60	0	8	22	6	4	0	0	-	-	-	-	-	-	-	-	-	-	30
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Early potatoes	0	7	0	9	0	0	20	12	15	25	13	-	-	-	-	-	-	-	8
2nd Early/Maincrop potatoes	15	6	5	8	5	5	6	17	10	5	9	5	1	3	-	-	-	-	120
Sugar beet	49	4	14	15	6	6	4	2	-	-	-	-	-	-	-	-	-	-	192
Spring oilseed rape	43	5	13	21	11	5	2	-	-	-	-	-	-	-	-	-	-	-	75
Winter oilseed rape	39	4	12	30	12	2	-	-	-	-	-	-	-	-	-	-	-	-	382
Linseed	58	0	23	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Forage maize	32	16	8	27	8	4	4	1	-	-	-	-	-	-	-	-	-	-	151
Rootcrops for stockfeed	33	4	20	8	11	7	5	12	-	-	-	-	-	-	-	-	-	-	33
Leafy forage crops	33	8	46	10	2	1	-	-	-	-	-	-	-	-	-	-	-	-	22
Arable silage/Other fodder crops	38	24	14	16	8	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Peas - human consumption	54	0	17	25	2	2	-	-	-	-	-	-	-	-	-	-	-	-	49
Peas - animal consumption	69	3	3	20	4	0	1	-	-	-	-	-	-	-	-	-	-	-	99
Beans - animal consumption	61	2	11	18	6	2	-	-	-	-	-	-	-	-	-	-	-	-	179
Vegetables (brassicae)	15	7	12	24	32	11	-	-	-	-	-	-	-	-	-	-	-	-	28
Vegetable (other)	19	0	34	24	9	4	5	2	1	2	1	0	0	1	-	-	-	-	51
Soft fruit	1	15	2	44	37	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Top fruit	54	29	2	11	0	1	0	0	3	-	-	-	-	-	-	-	-	-	54
Other tillage	76	5	8	9	0	1	1	-	-	-	-	-	-	-	-	-	-	-	67
All tillage	39	6	13	25	12	3	1	1	-	-	-	-	-	-	-	-	-	-	4559
Grass under 5 years old	36	21	27	9	5	1	-	-	-	-	-	-	-	-	-	-	-	-	724
Grass 5 years and over	46	28	21	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2225
All grass	45	27	22	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2949
All crops and grass	42	17	18	14	6	2	-	-	-	-	-	-	-	-	-	-	-	-	7508

Source: British Survey of Fertiliser Practice 2004

Table EW1.7 Percentage of crop area by field application rate - K_2O, England & Wales 2004

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Spring wheat	60	3	12	18	7	-	-	-	-	-	-	-	-	-	-	-	-	-	40
Winter wheat	40	3	7	18	20	7	2	1	1	-	-	-	-	-	-	-	-	-	1855
Spring barley	22	8	19	21	22	6	1	1	0	-	-	-	-	-	-	-	-	-	395
Winter barley	24	3	11	20	25	10	4	1	1	-	-	-	-	-	-	-	-	-	526
Oats	34	4	13	15	17	12	1	3	-	-	-	-	-	-	-	-	-	-	131
Rye/Triticale/Durum wheat	55	0	1	9	30	0	0	4	-	-	-	-	-	-	-	-	-	-	30
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Early potatoes	0	0	7	0	0	0	0	0	12	0	12	8	61	-	-	-	-	-	8
2nd Early/Maincrop potatoes	14	3	1	3	0	1	4	8	5	5	8	11	6	15	6	3	4	2	120
Sugar beet	20	6	2	7	7	15	21	9	3	2	1	4	4	1	-	-	-	-	192
Spring oilseed rape	46	1	12	19	14	5	1	2	-	-	-	-	-	-	-	-	-	-	75
Winter oilseed rape	38	2	13	20	17	6	2	1	1	-	-	-	-	-	-	-	-	-	382
Linseed	56	6	7	27	3	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Forage maize	46	7	7	10	10	9	3	4	1	2	-	-	-	-	-	-	-	-	151
Rootcrops for stockfeed	29	0	18	6	9	4	0	17	5	8	3	-	-	-	-	-	-	-	33
Leafy forage crops	33	8	5	7	45	2	-	-	-	-	-	-	-	-	-	-	-	-	22
Arable silage/Other fodder crops	34	23	15	16	12	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Peas - human consumption	50	1	14	30	1	3	0	1	-	-	-	-	-	-	-	-	-	-	49
Peas - animal consumption	61	1	7	12	12	4	1	0	1	-	-	-	-	-	-	-	-	-	99
Beans - animal consumption	56	2	4	22	8	5	0	0	2	0	-	-	-	-	-	-	-	-	179
Vegetables (brassicae)	9	0	2	0	32	17	0	2	22	15	-	-	-	-	-	-	-	-	28
Vegetable (other)	18	0	0	4	24	20	16	5	4	2	4	-	-	-	-	-	-	-	51
Soft fruit	23	52	2	1	0	22	-	-	-	-	-	-	-	-	-	-	-	-	16
Top fruit	43	17	0	3	10	5	0	19	3	-	-	-	-	-	-	-	-	-	54
Other tillage	66	6	1	5	8	1	3	8	-	-	-	-	-	-	-	-	-	-	67
All tillage	37	3	9	17	18	7	3	2	1	-	-	-	-	-	-	-	-	-	4559
Grass under 5 years old	31	15	21	13	8	5	4	2	0	1	-	-	-	-	-	-	-	-	724
Grass 5 years and over	46	25	20	5	2	1	1	-	-	-	-	-	-	-	-	-	-	-	2225
All grass	44	24	20	6	3	1	1	-	-	-	-	-	-	-	-	-	-	-	2949
All crops and grass	41	14	15	11	10	4	2	1	-	-	-	-	-	-	-	-	-	-	7508

Source: British Survey of Fertiliser Practice 2004

Table EW2.1 Average fertiliser practice by grassland utilisation, England & Wales 2004

	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	60	49	48	30	95	25	27	56	12	13	1382
Grazed mown	82	66	69	63	122	31	45	99	20	31	1318
All grazings	68	55	56	41	106	27	35	72	15	20	2700
Cut for silage - grazed	87	73	77	70	132	32	49	115	23	37	947
Cut for silage - not grazed	86	61	77	62	152	37	68	131	22	52	139
All cut for silage	87	71	77	69	134	33	51	117	23	39	1086
Cut for hay - grazed	65	48	48	40	90	28	36	58	13	17	413
Cut for hay - not grazed	70	38	43	35	84	28	32	59	11	14	76
All cut for hay	65	47	47	39	89	28	35	59	13	17	489
All mowings	82	65	69	61	124	31	47	101	20	33	1517
All grass	68	55	56	42	108	28	37	73	15	21	2949

Source: British Survey of Fertiliser Practice 2004

Table EW2.2 Percentage of grass area by field application rate - N, England & Wales 2004

	kg/ha																	
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	40	1	15	16	9	4	4	3	2	1	1	1	1	1	1	-	-	-	1382
Grazed mown	18	1	8	14	14	9	10	8	4	5	3	2	1	1	-	-	-	-	1318
All grazings	32	1	12	16	11	6	6	4	2	3	2	1	1	1	-	-	-	-	2700
Cut for silage - grazed	13	1	8	12	14	10	11	9	5	7	4	2	1	1	0	0	0	1	947
Cut for silage - not grazed	14	1	10	11	10	14	5	4	3	4	7	0	4	7	3	0	2	-	139
All cut for silage	13	1	8	12	14	11	10	9	5	6	5	2	1	2	1	0	1	-	1086
Cut for hay - grazed	35	2	10	17	14	5	8	5	2	0	1	0	1	-	-	-	-	-	413
Cut for hay - not grazed	30	0	14	14	16	21	1	2	0	2	0	-	-	-	-	-	-	-	76
All cut for hay	35	2	11	16	14	7	7	4	2	1	1	0	1	-	-	-	-	-	489
All mowings	18	1	9	14	14	10	10	7	4	5	4	2	1	1	-	-	-	-	1517
All grass	32	1	12	15	11	6	6	4	2	3	2	1	1	1	1	-	-	-	2949

Source: British Survey of Fertiliser Practice 2004

Table EW2.3 Percentage of grass area by field application rate - P_2O_5, England & Wales 2004

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	51	29	17	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1382
Grazed mown	34	26	31	7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1318
All grazings	45	28	22	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2700
Cut for silage - grazed	27	26	34	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	947
Cut for silage - not grazed	39	26	20	6	6	4	-	-	-	-	-	-	-	-	-	-	-	-	139
All cut for silage	29	26	33	8	3	1	-	-	-	-	-	-	-	-	-	-	-	-	1086
Cut for hay - grazed	52	22	21	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	413
Cut for hay - not grazed	62	13	23	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76
All cut for hay	53	21	21	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	489
All mowings	35	26	29	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1517
All grass	45	27	22	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2949

Source: British Survey of Fertiliser Practice 2004

Table EW2.4 Percentage of grass area by field application rate - K_2O, England & Wales 2004

row %	kg/ha																		Fields in sample
	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	
Grazed not mown	52	27	16	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1382
Grazed mown	31	19	27	10	7	3	2	-	-	-	-	-	-	-	-	-	-	-	1318
All grazings	44	24	20	6	3	1	1	-	-	-	-	-	-	-	-	-	-	-	2700
Cut for silage - grazed	23	19	30	12	9	4	3	-	-	-	-	-	-	-	-	-	-	-	947
Cut for silage - not grazed	23	18	20	12	8	4	6	4	1	4	-	-	-	-	-	-	-	-	139
All cut for silage	23	19	28	12	8	4	3	1	0	1	-	-	-	-	-	-	-	-	1086
Cut for hay - grazed	52	19	20	4	2	2	1	-	-	-	-	-	-	-	-	-	-	-	413
Cut for hay - not grazed	57	17	18	5	2	0	0	1	-	-	-	-	-	-	-	-	-	-	76
All cut for hay	53	19	20	4	2	1	1	-	-	-	-	-	-	-	-	-	-	-	489
All mowings	31	19	26	10	6	3	2	1	0	1	-	-	-	-	-	-	-	-	1517
All grass	44	24	20	6	3	1	1	-	-	-	-	-	-	-	-	-	-	-	2949

Source: British Survey of Fertiliser Practice 2004

Table EW3.0 Product and nutrient use by month of application, England & Wales 2004

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product (000 tonnes)
Straight N	1	0	0	0	0	6	30	37	17	4	3	1	1800
Straight P	25	15	7	3	0	9	19	4	5	0	3	10	32
Straight K	10	13	17	2	3	18	19	12	3	1	0	1	87
Compound	7	6	2	1	1	6	23	24	14	7	4	5	1855
All Fertilisers	4	4	2	1	1	7	26	30	15	6	3	3	3775

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient (000 tonnes)
N	1	0	0	0	0	6	29	36	17	6	3	2	989
P_2O_5	12	10	4	2	1	8	22	19	9	3	2	6	230
K_2O	10	11	4	2	2	10	21	18	10	5	2	5	317
Total	4	4	1	1	1	7	26	30	15	5	3	3	1536

Note: Product use refers to the total tonnage of the products used by farmers in the survey year 2004;
Nutrient use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5, and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2004

Table EW3.1 Product type as percentage of all product used by crop group, England & Wales 2004

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 spec	all grass	all crops and grass
Calcium Ammonium Nitrate	0.6	0.6	0.0	0.1	1.4	2.3	0.7	0.1	0.0	0.0	0.0	0.1	0.5
Urea	2.4	9.4	7.2	3.2	10.8	1.3	8.3	1.7	1.9	2.0	5.0	1.7	5.9
Ammonium Nitrate	30.6	45.3	5.3	20.8	40.3	17.2	39.1	23.1	26.8	21.0	28.8	23.2	33.4
Urea Ammonium Nitrate	6.3	10.9	2.4	2.7	15.0	1.4	9.8	0.2	0.5	0.3	0.0	0.2	6.4
Other Straight N	1.3	1.6	0.0	0.6	4.9	1.6	1.9	0.5	0.1	0.5	0.3	0.6	1.4
Triple Superphosphate	0.6	1.1	0.1	0.0	1.1	2.2	1.0	0.1	0.0	0.0	0.0	0.1	0.7
Single Superphosphate	0.0	0.0	0.0	1.8	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Other Straight P	0.0	0.1	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Muriate of Potash	1.6	1.5	4.2	1.6	1.9	6.4	2.0	0.3	0.5	0.5	2.1	0.4	1.4
Other Straight K	0.2	0.3	0.9	23.6	0.2	1.6	1.4	0.0	0.0	0.0	0.0	0.0	0.9
NP	0.2	0.7	3.7	0.5	1.3	5.3	1.2	2.4	1.7	1.6	0.0	2.4	1.6
NK	3.5	2.2	0.0	1.2	1.9	2.7	2.1	7.2	5.9	14.7	0.0	8.4	4.3
PK	14.5	19.6	3.7	34.4	14.1	29.7	19.0	2.6	3.3	2.5	6.9	2.7	13.1
Very High N	10.5	2.7	0.8	0.5	0.9	4.2	2.8	33.4	21.7	28.2	36.7	32.3	13.4
High N	17.8	0.9	0.9	1.5	0.2	6.9	2.2	25.1	33.3	24.2	18.7	24.5	10.2
High P	0.0	0.3	0.1	0.0	0.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2
High K	3.8	1.1	42.1	4.0	1.2	7.6	3.8	1.0	2.6	1.9	0.0	1.1	2.8
Low N	1.3	1.2	17.3	2.3	1.7	1.8	2.2	0.4	0.4	0.9	0.0	0.6	1.6
Low P	1.5	0.2	5.0	0.4	0.0	5.7	0.8	0.4	0.7	0.9	0.0	0.5	0.7
Equal NPK	3.3	0.4	6.2	0.6	2.5	1.1	1.2	1.1	0.7	0.8	1.4	1.1	1.1
Total Product ('000 tonnes)	**153**	**1579**	**119**	**105**	**329**	**139**	**2424**	**1246**	**128**	**624**	**7**	**1351**	**3775**

Source: British Survey of Fertiliser Practice 2004

Table EW3.2 Use of product type by crop group, England & Wales 2004

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 spec	all grass	total product (000 tonnes)
Calcium Ammonium Nitrate	4.4	45.4	0.0	0.5	23.9	15.8	89.9	9.2	0.3	0.8	0.0	10.1	20
Urea	1.6	66.3	3.8	1.5	15.8	0.8	89.8	9.4	1.1	5.5	0.2	10.2	224
Ammonium Nitrate	3.7	56.7	0.5	1.7	10.5	1.9	75.1	22.8	2.7	10.4	0.2	24.9	1261
Urea Ammonium Nitrate	4.0	71.2	1.2	1.2	20.4	0.8	98.9	1.1	0.3	0.7	0.0	1.1	241
Other Straight N	3.8	46.2	0.0	1.1	30.1	4.2	85.4	12.6	0.3	5.3	0.0	14.6	54
Triple Superphosphate	3.3	65.4	0.4	0.1	14.1	11.6	94.9	4.7	0.0	1.0	0.0	5.1	26
Single Superphosphate	0.0	0.0	0.0	58.3	0.0	0.0	58.3	41.7	0.0	0.0	0.0	41.7	3
Other Straight P	0.0	42.6	0.0	1.5	3.3	36.6	84.0	16.0	0.0	0.0	0.0	16.0	3
Muriate of Potash	4.8	44.4	9.6	3.2	11.7	17.2	90.9	7.9	1.2	5.8	0.3	9.1	52
Other Straight K	0.8	14.8	3.2	71.2	2.2	6.4	98.7	0.9	0.0	0.8	0.0	1.3	35
NP	0.6	18.7	7.4	0.8	7.1	12.2	46.7	50.1	3.6	16.0	0.0	53.3	60
NK	3.2	20.8	0.0	0.8	3.7	2.3	30.9	55.0	4.6	55.9	0.0	69.1	164
PK	4.5	62.3	0.9	7.3	9.4	8.3	92.7	6.6	0.8	3.1	0.1	7.3	496
Very High N	3.2	8.5	0.2	0.1	0.6	1.2	13.7	82.4	5.5	34.9	0.5	86.3	505
High N	7.0	3.7	0.3	0.4	0.2	2.5	14.1	81.1	11.1	39.3	0.3	85.9	385
High P	0.0	73.2	2.5	0.0	21.8	2.6	100.0	0.0	0.0	0.0	0.0	0.0	6
High K	5.4	16.7	46.7	4.0	3.8	9.8	86.4	11.8	3.1	10.9	0.0	13.6	107
Low N	3.3	32.6	34.1	4.1	9.2	4.3	87.5	7.4	0.9	9.6	0.0	12.5	60
Low P	8.4	9.3	22.3	1.5	0.6	30.1	72.2	19.2	3.1	20.7	0.0	27.8	27
Equal NPK	11.7	13.5	17.1	1.5	18.9	3.5	66.2	32.6	2.0	11.5	0.2	33.8	43
All Fertilisers	**4.0**	**41.8**	**3.1**	**2.9**	**8.7**	**3.7**	**64.3**	**32.9**	**3.4**	**16.5**	**0.2**	**35.7**	**3775**

Source: British Survey of Fertiliser Practice 2004

Table EW3.3 Product use by month of application, England & Wales 2004

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total Product (000 tonnes)
Calcium Ammonium Nitrate	0.0	3.8	33.4	46.9	11.2	0.0	2.2	0.8	0.0	0.0	0.0	1.9	20
Urea	0.0	8.2	28.7	38.8	15.3	4.0	4.3	0.0	0.5	0.1	0.0	0.2	224
Ammonium Nitrate	0.0	5.0	29.4	37.5	18.7	4.9	2.4	1.4	0.5	0.2	0.1	0.0	1261
Urea Ammonium Nitrate	0.3	8.8	31.7	36.9	16.3	2.3	1.8	1.0	0.7	0.3	0.0	0.0	241
Other Straight N	0.3	17.5	52.0	16.6	2.9	7.2	2.5	0.4	0.6	0.0	0.0	0.0	54
Triple Superphosphate	0.0	10.6	17.5	3.4	6.4	0.4	3.7	7.3	30.8	15.6	2.9	1.1	26
Single Superphosphate	0.0	0.0	21.1	0.0	0.0	0.0	0.0	0.0	0.0	18.8	39.4	20.6	3
Other Straight P	0.0	8.8	29.3	16.0	0.0	0.0	0.0	42.6	0.0	0.0	3.3	0.0	3
Muriate of Potash	3.6	16.1	25.7	16.7	5.6	0.8	0.0	1.7	4.3	14.9	8.5	2.1	52
Other Straight K	3.1	22.0	9.3	4.5	0.0	0.4	0.0	0.0	18.7	10.3	29.5	2.2	35
NP	0.0	10.1	43.3	26.6	11.3	1.8	3.2	0.7	1.4	1.6	0.0	0.0	60
NK	0.0	6.8	12.1	14.8	29.7	21.4	10.6	3.0	0.6	0.0	0.0	1.0	164
PK	3.8	11.7	13.8	5.1	3.8	0.9	0.5	7.1	20.9	20.7	7.6	4.0	496
Very High N	0.1	2.8	28.7	28.2	16.3	12.0	5.7	5.1	0.9	0.1	0.0	0.1	505
High N	0.2	3.9	22.4	36.5	20.5	7.3	4.5	2.4	0.8	1.6	0.1	0.0	385
High P	0.0	10.5	8.7	0.4	25.1	0.0	0.0	24.3	31	0.0	0.0	0.0	6
High K	0.0	7.1	39.9	45.7	4.9	0.6	0.0	0.7	1.1	0.1	0.0	0.0	107
Low N	0.0	4.1	38.7	26.8	1.2	1.3	1.7	6.6	10.6	8.2	0.9	0.0	60
Low P	0.0	4.1	23.1	52.2	4.1	8.4	0.2	5.3	0.7	1.8	0.0	0.0	27
Equal NPK	0.0	6.6	28.7	26.6	14.3	1.4	0.8	14.0	3.0	3.0	1.7	0.0	43
All Fertilisers	**0.7**	**6.6**	**26.5**	**29.6**	**15.0**	**5.6**	**3.1**	**3.0**	**4**	**3.6**	**1.5**	**0.7**	**3775**

Source: British Survey of Fertiliser Practice 2004

Table EW4.1 Average fertiliser practice on tillage and grassland by BSFP region, 2004

		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	92	66	65	36	181	64	77	167	42	50	315
	All grass	66	35	44	38	150	28	42	99	10	18	182
	All crops & grass	78	49	54	37	167	50	62	131	25	33	497
Anglia	All tillage	88	53	44	7	162	70	91	143	37	40	864
	All grass	56	20	21	3	84	36	45	47	7	9	72
	All crops & grass	85	50	42	7	158	69	89	135	34	37	936
Northern	All tillage	94	86	90	30	155	58	78	146	50	71	257
	All grass	71	65	66	48	89	26	30	63	17	20	496
	All crops & grass	75	69	71	45	104	33	40	78	23	29	753
North East	All tillage	93	58	67	18	185	63	90	171	37	61	803
	All grass	60	48	49	39	126	30	41	75	14	20	351
	All crops & grass	78	54	59	28	164	49	72	127	26	42	1154
North Mercia	All tillage	88	63	74	43	151	49	86	133	31	64	225
	All grass	64	45	48	47	102	23	36	66	10	17	211
	All crops & grass	72	51	57	45	122	34	58	88	17	33	436
South Mercia	All tillage	90	62	67	20	164	62	78	147	39	52	305
	All grass	68	38	38	15	112	27	34	76	10	13	178
	All crops & grass	80	51	54	17	144	51	64	115	26	34	483
East Midland	All tillage	93	59	61	10	174	62	76	163	37	47	946
	All grass	53	29	31	30	126	26	33	67	8	10	247
	All crops & grass	83	51	54	15	166	57	70	138	29	37	1193
South East	All tillage	88	58	65	13	181	60	82	160	35	53	485
	All grass	49	28	27	12	99	25	31	49	7	8	223
	All crops & grass	72	46	49	13	158	51	71	114	23	35	708
South West	All tillage	82	76	75	41	136	67	89	112	51	67	216
	All grass	79	71	71	67	130	33	49	103	24	35	329
	All crops & grass	80	72	72	60	132	42	59	105	30	42	545
Wales	All tillage	97	76	83	58	119	51	72	115	38	60	143
	All grass	77	73	72	48	96	28	36	75	20	26	660
	All crops & grass	79	73	73	49	98	29	39	77	21	28	803

Source: British Survey of Fertiliser Practice 2004

Table EW5.1 Average fertiliser practice on dairy farms, England & Wales 2004

	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	60	60	98	80	41	33	49	25	20	8
Winter wheat	98	68	74	49	155	56	73	152	38	54	81
Spring barley	91	80	85	76	73	34	43	66	27	36	43
Winter barley	98	89	89	67	122	51	58	120	46	52	37
Oats	76	32	32	70	60	36	43	46	12	14	10
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	1
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	88	81	55	98	54	56	82	48	46	45	78
Rootcrops for stockfeed	40	29	51	90	91	35	107	36	10	54	6
Leafy forage crops	90	90	90	82	118	35	38	106	32	34	6
Arable silage/Other fodder crops	60	60	60	87	68	28	32	41	17	19	12
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	0	42	30	45	0	65	38	0	28	11	5
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	2
All tillage	87	73	66	77	98	52	70	86	38	46	300
Grass under 5 years old	90	69	80	74	186	36	61	167	25	49	241
Grass 5 years and over	81	61	64	69	147	29	45	118	18	29	534
All grass	83	63	67	70	156	31	49	129	19	33	775
All crops and grass	83	64	67	71	149	34	52	124	22	35	1075

Source: British Survey of Fertiliser Practice 2004

Table EW5.2 Average fertiliser practice on cattle and sheep farms, England & Wales 2004

	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	65	64	33	175	62	81	175	40	52	55
Spring barley	98	80	86	43	92	47	56	90	37	48	53
Winter barley	95	74	80	68	122	65	70	117	48	56	49
Oats	82	69	74	59	85	49	55	70	34	41	19
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	1
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	56	56	13	207	67	86	207	38	48	5
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	64	54	40	83	73	65	72	47	35	29	23
Rootcrops for stockfeed	92	92	92	77	73	70	75	67	64	69	11
Leafy forage crops	52	52	52	29	70	43	43	36	22	22	8
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	4
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	0	44	54	0	0	38	58	0	17	31	6
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	1
Other tillage	-	-	-	-	-	-	-	-	-	-	3
All tillage	90	69	72	51	124	58	68	112	40	48	243
Grass under 5 years old	83	68	70	46	108	37	51	90	25	36	213
Grass 5 years and over	63	57	57	40	75	24	26	47	14	15	1106
All grass	64	58	58	40	78	25	28	50	15	16	1319
All crops and grass	65	59	58	41	80	27	30	52	16	18	1562

Source: British Survey of Fertiliser Practice 2004

Table EW5.3 Average fertiliser practice on other livestock/mixed farms, England & Wales 2004

	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	35	11	11	11	154	99	64	54	10	7	10
Winter wheat	97	47	47	34	176	57	76	170	27	36	286
Spring barley	95	70	70	41	102	37	51	97	26	35	67
Winter barley	98	74	75	22	146	55	75	143	41	56	99
Oats	85	59	55	48	100	49	67	85	29	37	37
Rye/Triticale/Durum wheat	36	27	27	36	109	45	59	40	12	16	15
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	88	72	72	47	187	253	337	165	183	243	12
Sugar beet	85	39	46	34	107	50	122	92	19	57	15
Spring oilseed rape	100	53	55	40	131	78	82	131	42	45	13
Winter oilseed rape	100	55	52	42	194	49	71	194	27	36	45
Linseed	-	-	-	-	-	-	-	-	-	-	3
Forage maize	75	42	46	69	87	102	114	65	43	53	39
Rootcrops for stockfeed	86	52	52	91	176	147	194	151	77	101	7
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/Other fodder crops	57	72	72	73	73	26	33	41	19	23	5
Peas - human consumption	0	0	0	17	0	0	0	0	0	0	7
Peas - animal consumption	18	49	49	50	63	40	57	11	19	28	5
Beans - animal consumption	4	28	35	20	25	51	67	1	15	23	25
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	31	31	31	69	97	40	90	30	12	28	6
Soft fruit	-	-	-	-	-	-	-	-	-	-	2
Top fruit	-	-	-	-	-	-	-	-	-	-	3
Other tillage	16	10	10	1	75	54	70	12	6	7	9
All tillage	87	51	51	35	155	58	79	134	30	40	713
Grass under 5 years old	73	52	59	34	163	40	61	119	21	36	128
Grass 5 years and over	58	37	35	17	111	28	32	64	10	11	208
All grass	62	41	42	21	127	32	43	79	13	18	336
All crops and grass	74	46	47	28	144	46	63	107	22	29	1049

Source: British Survey of Fertiliser Practice 2004

Table EW5.4 Average fertiliser practice on cropping/horticultural farms, England & Wales 2004

	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	39	51	21	157	43	67	157	16	34	20
Winter wheat	99	61	61	11	204	64	78	203	39	47	1433
Spring barley	98	71	79	10	114	47	67	112	33	52	232
Winter barley	100	70	75	11	141	60	80	141	42	60	341
Oats	97	71	71	2	119	64	82	114	46	58	65
Rye/Triticale/Durum wheat	89	68	74	42	121	68	89	107	46	66	12
Seed potatoes	-	-	-	-	-	-	-	-	-	-	1
Early potatoes	100	100	100	20	167	162	245	167	162	245	8
2nd Early/Maincrop potatoes	98	85	87	30	160	142	237	157	121	206	105
Sugar beet	92	52	82	24	103	73	130	95	38	107	176
Spring oilseed rape	100	57	53	11	131	62	68	131	36	36	59
Winter oilseed rape	99	62	64	9	213	62	72	211	38	46	329
Linseed	76	42	45	10	79	49	52	60	21	23	26
Forage maize	93	58	85	89	51	29	60	47	17	52	11
Rootcrops for stockfeed	93	71	70	37	127	66	127	119	47	89	9
Leafy forage crops	75	80	80	72	185	30	91	139	24	73	5
Arable silage/Other fodder crops	84	29	58	67	127	80	78	108	23	45	5
Peas - human consumption	5	49	54	7	67	63	64	3	31	35	42
Peas - animal consumption	7	30	38	5	28	58	73	2	17	28	91
Beans - animal consumption	12	41	45	5	32	60	73	4	25	33	144
Vegetables (brassicae)	98	85	91	13	197	70	136	193	60	123	28
Vegetable (other)	84	86	88	8	108	76	134	91	65	117	44
Soft fruit	99	99	74	0	69	66	41	68	65	30	14
Top fruit	92	47	58	0	53	26	85	49	12	49	50
Other tillage	40	31	43	9	80	48	102	32	15	44	53
All tillage	92	61	65	12	178	64	85	163	39	55	3303
Grass under 5 years old	83	57	55	16	120	34	57	99	19	31	142
Grass 5 years and over	55	30	31	4	98	28	39	54	8	12	377
All grass	61	36	36	7	105	30	46	65	11	17	519
All crops and grass	87	58	61	11	171	61	82	149	35	50	3822

Source: British Survey of Fertiliser Practice 2004

Table SC1.1 Total fertiliser use, Scotland 2004

	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	87	84	84	8	135	58	75	118	48	63	12
Winter wheat	95	90	90	16	201	71	87	192	64	78	200
Spring barley	99	97	97	31	104	60	68	103	58	66	397
Winter barley	100	98	98	12	189	75	89	189	74	87	102
Oats	83	86	86	22	100	55	67	83	47	57	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	4
Seed potatoes	90	90	90	25	120	175	204	109	158	185	20
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	95	95	95	8	131	122	152	125	115	144	24
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	100	100	100	11	171	77	78	171	77	78	12
Winter oilseed rape	100	92	92	9	217	63	63	217	58	58	55
Linseed	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	98	100	100	80	84	125	96	82	125	96	36
Leafy forage crops	55	72	72	55	86	71	69	47	51	49	17
Arable silage/Other fodder crops	47	45	47	11	74	43	65	35	19	30	12
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	4
Vegetable (other)	67	83	83	0	72	108	89	48	90	74	7
Soft fruit	100	100	100	27	31	38	54	31	38	54	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	96	93	93	24	140	67	77	134	63	72	965
Grass under 5 years old	89	81	77	26	121	41	53	107	33	41	368
Grass 5 years and over	79	75	73	26	109	33	36	87	25	26	499
All grass	82	77	75	26	113	36	41	93	27	30	867
All crops and grass	87	83	82	25	124	49	56	108	41	46	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.2 Use of straight fertiliser, Scotland 2004

	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	81	0	9	111	0	113	90	0	11	12
Winter wheat	91	3	9	188	74	127	170	2	12	200
Spring barley	67	0	2	75	0	89	50	0	2	397
Winter barley	96	0	2	162	0	123	155	0	3	102
Oats	46	0	0	106	0	0	49	0	0	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	4
Seed potatoes	3	0	10	19	0	207	1	0	21	20
Early potatoes	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	33	0	3	113	0	162	38	0	5	24
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	68	0	0	128	0	0	87	0	0	12
Winter oilseed rape	100	3	6	189	74	75	189	1	4	55
Linseed	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	2	0	0	47	0	0	1	0	0	36
Leafy forage crops	21	0	0	65	0	0	14	0	0	17
Arable silage/Other fodder crops	11	0	2	115	0	65	13	0	1	12
Peas - human consumption	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	4
Vegetable (other)	23	0	15	51	0	186	12	0	28	7
Soft fruit	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	0
All tillage	72	1	4	126	74	115	90	0	4	965
Grass under 5 years old	29	1	2	83	65	97	24	0	2	368
Grass 5 years and over	19	1	0	96	107	0	19	1	0	499
All grass	22	1	1	91	95	91	20	1	1	867
All crops and grass	41	1	2	114	86	109	46	0	2	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.3 Use of compound fertiliser, Scotland 2004

	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	71	84	84	39	58	63	27	48	53	12
Winter wheat	49	87	84	44	70	79	22	62	66	200
Spring barley	91	97	97	58	60	67	53	58	64	397
Winter barley	75	98	98	45	75	86	34	74	84	102
Oats	63	86	86	55	55	67	35	47	57	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	4
Seed potatoes	90	90	81	119	175	204	108	158	164	20
Early potatoes	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	95	95	91	92	122	152	87	115	139	24
Sugar beet	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	100	100	100	84	77	78	84	77	78	12
Winter oilseed rape	75	92	86	37	63	62	27	58	53	55
Linseed	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	98	100	100	83	125	96	81	125	96	36
Leafy forage crops	40	72	72	82	71	69	33	51	49	17
Arable silage/Other fodder crops	45	45	45	48	43	65	22	19	29	12
Peas - human consumption	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	4
Vegetable (other)	67	83	68	54	108	68	36	90	46	7
Soft fruit	100	100	100	31	38	54	31	38	54	5
Top fruit	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	0
All tillage	78	93	91	56	67	74	44	62	68	965
Grass under 5 years old	76	81	76	109	41	52	83	33	39	368
Grass 5 years and over	70	75	73	98	33	35	68	24	26	499
All grass	72	77	74	101	35	40	73	27	30	867
All crops and grass	74	83	80	84	48	55	62	40	44	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.4 Use of lime, Scotland 2004

	Crop area receiving dressing (%)						Average field rate of CaO equivalent (tonnes/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	-	-	-	-	-	-	-	-	-	-	-	-	1	12
Winter wheat	1.0	-	1.7	-	1.2	3.9	3.9	-	4.1	-	0.7	3.0	11	200
Spring barley	8.5	-	6.4	-	0.8	15.7	4.5	-	4.2	-	1.2	4.2	71	397
Winter barley	12.0	-	4.3	-	-	16.3	5.3	-	5.0	-	-	5.2	14	102
Oats	2.7	-	7.2	-	-	9.9	4.5	-	5.0	-	-	4.8	6	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	1	4
Seed potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	-	-	0	24
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	1	12
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	-	-	2	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Rootcrops for stockfeed	6.2	-	5.3	-	-	11.6	3.5	-	4.9	-	-	4.1	7	36
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	-	-	4	17
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	-	-	2	12
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	-	-	3	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	0	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	0	4
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	-	-	2	7
Soft fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	0	0
All tillage	6.3	-	4.9	-	0.8	12.1	4.6	-	4.4	-	1.5	4.3	127	965
Grass under 5 years old	4.4	-	1.6	-	1.5	7.5	4.0	-	4.0	-	3.1	3.8	33	368
Grass 5 years and over	0.8	-	1.1	-	0.1	2.0	2.1	-	4.7	-	2.9	3.5	27	499
All grass	1.9	-	1.2	-	0.5	3.6	3.4	-	4.4	-	3.1	3.7	60	867
All crops and grass	3.5	-	2.6	-	0.6	6.8	4.2	-	4.4	-	2.3	4.1	187	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.5 Percentage of crop area by field application rate - N, Scotland 2004

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Spring wheat	13	0	15	0	1	5	19	47	-	-	-	-	-	-	-	-	-	-	12
Winter wheat	5	0	0	4	1	1	5	13	18	34	9	4	0	0	1	0	0	4	200
Spring barley	1	1	5	15	19	37	16	2	6	-	-	-	-	-	-	-	-	-	397
Winter barley	0	0	0	1	0	7	11	20	21	26	5	3	0	0	1	3	-	-	102
Oats	17	1	13	17	3	24	8	17	1	-	-	-	-	-	-	-	-	-	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Seed potatoes	10	0	0	9	12	26	25	19	-	-	-	-	-	-	-	-	-	-	20
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	5	14	0	4	14	6	28	3	7	2	18	-	-	-	-	-	-	-	24
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	0	0	0	0	23	11	0	13	23	0	25	5	-	-	-	-	-	-	12
Winter oilseed rape	0	0	0	2	0	0	1	7	21	24	36	6	0	3	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	2	1	7	18	49	16	0	7	-	-	-	-	-	-	-	-	-	-	36
Leafy forage crops	45	0	10	9	18	13	0	0	5	-	-	-	-	-	-	-	-	-	17
Arable silage/Other fodder crops	53	14	13	0	10	0	0	0	0	9	-	-	-	-	-	-	-	-	12
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	33	0	0	47	15	0	0	0	5	-	-	-	-	-	-	-	-	-	7
Soft fruit	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
All tillage	4	1	3	10	11	22	12	8	10	11	5	2	0	0	0	0	0	1	965
Grass under 5 years old	11	0	7	23	12	8	14	7	3	7	4	3	1	-	-	-	-	-	368
Grass 5 years and over	21	0	10	24	9	10	8	5	4	3	2	3	0	1	-	-	-	-	499
All grass	18	0	9	24	10	9	10	5	3	4	3	3	0	1	-	-	-	-	867
All crops and grass	13	0	7	19	11	14	10	6	6	7	4	2	-	-	-	-	-	-	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.6 Percentage of crop area by field application rate - P_2O_5, Scotland 2004

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Spring wheat	16	10	32	7	29	6	-	-	-	-	-	-	-	-	-	-	-	-	12
Winter wheat	10	9	4	28	43	6	-	-	-	-	-	-	-	-	-	-	-	-	200
Spring barley	3	4	18	53	18	4	-	-	-	-	-	-	-	-	-	-	-	-	397
Winter barley	2	0	5	36	49	8	-	-	-	-	-	-	-	-	-	-	-	-	102
Oats	14	9	22	33	20	2	-	-	-	-	-	-	-	-	-	-	-	-	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Seed potatoes	10	0	0	0	3	0	24	22	11	23	8	-	-	-	-	-	-	-	20
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	5	26	4	9	6	2	16	0	4	10	15	3	-	-	-	-	-	-	24
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	0	9	0	42	24	25	-	-	-	-	-	-	-	-	-	-	-	-	12
Winter oilseed rape	8	7	15	41	22	6	-	-	-	-	-	-	-	-	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	0	1	2	2	29	14	9	34	9	-	-	-	-	-	-	-	-	-	36
Leafy forage crops	28	0	11	35	6	19	0	0	1	-	-	-	-	-	-	-	-	-	17
Arable silage/Other fodder crops	55	14	11	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	17	0	0	19	0	41	15	5	-	-	-	-	-	-	-	-	-	-	7
Soft fruit	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
All tillage	7	6	13	42	25	5	1	1	-	-	-	-	-	-	-	-	-	-	965
Grass under 5 years old	19	21	33	21	5	0	0	1	-	-	-	-	-	-	-	-	-	-	368
Grass 5 years and over	25	30	32	10	2	0	0	1	-	-	-	-	-	-	-	-	-	-	499
All grass	23	27	32	13	3	0	0	1	-	-	-	-	-	-	-	-	-	-	867
All crops and grass	17	19	25	24	11	2	0	1	-	-	-	-	-	-	-	-	-	-	1832

Source: British Survey of Fertiliser Practice 2004

Table SC1.7 Percentage of crop area by field application rate - K_2O, Scotland 2004

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Spring wheat	16	9	22	0	38	0	0	15	-	-	-	-	-	-	-	-	-	-	12
Winter wheat	10	9	0	14	38	23	2	0	3	-	-	-	-	-	-	-	-	-	200
Spring barley	3	5	15	37	28	8	4	-	-	-	-	-	-	-	-	-	-	-	397
Winter barley	2	0	1	12	66	16	1	0	2	-	-	-	-	-	-	-	-	-	102
Oats	14	9	25	13	26	13	-	-	-	-	-	-	-	-	-	-	-	-	43
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Seed potatoes	10	0	0	0	0	5	4	6	13	32	27	3	-	-	-	-	-	-	20
Early potatoes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	5	26	0	4	9	6	0	3	6	8	5	19	0	8	-	-	-	-	24
Sugar beet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	0	9	0	31	13	47	-	-	-	-	-	-	-	-	-	-	-	-	12
Winter oilseed rape	8	10	14	30	31	6	-	-	-	-	-	-	-	-	-	-	-	-	55
Linseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	0	3	4	10	45	18	6	12	0	2	-	-	-	-	-	-	-	-	36
Leafy forage crops	28	0	39	8	5	15	5	-	-	-	-	-	-	-	-	-	-	-	17
Arable silage/Other fodder crops	53	14	11	2	0	19	-	-	-	-	-	-	-	-	-	-	-	-	12
Peas - human consumption	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	17	0	0	57	0	0	3	8	15	-	-	-	-	-	-	-	-	-	7
Soft fruit	0	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Top fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
All tillage	7	6	10	27	32	12	2	0	1	1	1	-	-	-	-	-	-	-	965
Grass under 5 years old	23	14	30	14	9	5	3	1	-	-	-	-	-	-	-	-	-	-	368
Grass 5 years and over	27	28	28	9	5	1	1	-	-	-	-	-	-	-	-	-	-	-	499
All grass	25	24	29	10	6	2	2	-	-	-	-	-	-	-	-	-	-	-	867
All crops and grass	18	18	22	16	16	6	2	0	1	-	-	-	-	-	-	-	-	-	1832

Source: British Survey of Fertiliser Practice 2004

Table SC2.1 Average fertiliser practice by grassland utilisation, Scotland 2004

	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	79	73	68	13	95	30	29	75	21	20	498
Grazed mown	93	90	92	58	143	45	60	133	40	55	239
All grazings	82	77	74	25	109	34	38	89	26	28	737
Cut for silage - grazed	93	89	91	62	148	46	62	137	41	56	194
Cut for silage - not grazed	90	85	88	46	162	52	68	145	45	60	107
All cut for silage	92	88	90	58	152	48	63	139	42	57	301
Cut for hay - grazed	99	98	98	22	103	35	41	102	34	40	50
Cut for hay - not grazed	83	83	83	29	129	46	36	107	38	30	16
All cut for hay	96	95	95	23	107	37	40	103	35	38	66
All mowings	92	88	91	55	147	47	61	135	41	55	359
All grass	82	77	75	26	113	36	41	93	27	30	867

Source: British Survey of Fertiliser Practice 2004

Table SC2.2 Percentage of grass area by field application rate - N, Scotland 2004

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	21	0	12	31	8	10	7	3	2	1	1	2	0	1	-	-	-	-	498
Grazed mown	7	0	3	10	16	9	16	9	6	11	5	3	2	0	1	-	-	-	239
All grazings	18	0	10	25	10	10	9	5	3	3	2	2	0	1	-	-	-	-	737
Cut for silage - grazed	7	0	2	9	15	8	17	10	7	12	6	4	2	0	1	-	-	-	194
Cut for silage - not grazed	10	0	1	7	8	7	18	11	7	11	8	9	1	1	1	-	-	-	107
All cut for silage	8	0	2	8	13	8	17	10	7	12	7	5	2	1	1	-	-	-	301
Cut for hay - grazed	1	0	7	18	25	15	13	16	2	0	1	-	-	-	-	-	-	-	50
Cut for hay - not grazed	17	0	0	17	16	2	22	10	2	0	14	-	-	-	-	-	-	-	16
All cut for hay	4	0	6	18	23	13	15	15	2	0	4	-	-	-	-	-	-	-	66
All mowings	8	0	2	9	15	9	17	10	6	11	6	5	2	0	1	-	-	-	359
All grass	18	0	9	24	10	9	10	5	3	4	3	3	0	1	-	-	-	-	867

Source: British Survey of Fertiliser Practice 2004

Table SC2.3 Percentage of grass area by field application rate - P_2O_5, Scotland 2004

	kg/ha																		
row %	0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	27	32	31	7	1	0	0	1	-	-	-	-	-	-	-	-	-	-	498
Grazed mown	10	17	37	28	7	0	0	1	-	-	-	-	-	-	-	-	-	-	239
All grazings	23	29	33	12	3	0	0	1	-	-	-	-	-	-	-	-	-	-	737
Cut for silage - grazed	11	15	36	30	7	0	0	1	-	-	-	-	-	-	-	-	-	-	194
Cut for silage - not grazed	15	12	33	28	11	0	0	0	0	2	-	-	-	-	-	-	-	-	107
All cut for silage	12	14	35	29	8	0	0	1	0	1	-	-	-	-	-	-	-	-	301
Cut for hay - grazed	2	31	50	12	2	2	-	-	-	-	-	-	-	-	-	-	-	-	50
Cut for hay - not grazed	17	14	33	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
All cut for hay	5	28	47	17	2	-	-	-	-	-	-	-	-	-	-	-	-	-	66
All mowings	12	16	35	28	7	0	0	1	0	1	-	-	-	-	-	-	-	-	359
All grass	23	27	32	13	3	0	0	1	-	-	-	-	-	-	-	-	-	-	867

Source: British Survey of Fertiliser Practice 2004

Table SC2.4 Percentage of grass area by field application rate - K_2O, Scotland 2004

row %	kg/ha 0	<25	25-	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-	400+	Fields in sample
Grazed not mown	32	30	30	6	1	0	1	-	-	-	-	-	-	-	-	-	-	-	498
Grazed mown	8	11	32	20	15	7	5	0	1	-	-	-	-	-	-	-	-	-	239
All grazings	26	25	30	10	5	2	2	-	-	-	-	-	-	-	-	-	-	-	737
Cut for silage - grazed	9	10	30	20	17	8	5	1	1	-	-	-	-	-	-	-	-	-	194
Cut for silage - not grazed	12	13	16	19	25	8	4	0	0	2	-	-	-	-	-	-	-	-	107
All cut for silage	10	11	27	20	19	8	5	0	1	1	-	-	-	-	-	-	-	-	301
Cut for hay - grazed	2	14	58	18	5	2	-	-	-	-	-	-	-	-	-	-	-	-	50
Cut for hay - not grazed	17	26	34	18	5	-	-	-	-	-	-	-	-	-	-	-	-	-	16
All cut for hay	5	17	54	18	5	2	-	-	-	-	-	-	-	-	-	-	-	-	66
All mowings	9	12	28	20	18	7	4	0	0	1	-	-	-	-	-	-	-	-	359
All grass	25	24	29	10	6	2	2	-	-	-	-	-	-	-	-	-	-	-	867

Source: British Survey of Fertiliser Practice 2004

Table SC3.0 Product and nutrient use by month of application, Scotland 2004

(a) Product use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Product (000 tonnes)
Straight N	1	1	0	0	0	2	21	47	21	4	2	1	202
Straight P	6	7	0	0	0	5	16	53	14	0	0	0	2
Straight K	0	3	0	4	0	27	12	28	11	3	13	0	6
Compound	4	4	2	0	0	1	18	40	13	10	6	4	530
All Fertilisers	3	3	1	0	0	2	19	42	15	8	5	3	741

(b) Nutrient use

row %	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total Nutrient (000 tonnes)
N	1	1	0	0	0	1	18	45	17	9	5	2	170
P_2O_5	7	6	3	0	0	2	21	36	11	6	3	4	64
K_2O	6	7	3	0	0	3	20	36	11	8	4	3	72
Total	4	3	1	0	0	2	19	41	15	8	4	3	306

Note: Product use refers to the total tonnage of the products used by farmers in the survey year 2001;
Nutrient use refers to the tonnage of each nutrient contained in the products used.
(e.g. 100 kg of a 20 : 10 : 10 compound contains 20 kg of N, 10 kg of P_2O_5, and 10 kg of K_2O, while 100 kg of ammonium nitrate, one of the straight N products, contains typically 34.5 kg of N).

Source: British Survey of Fertiliser Practice 2004

Table SC3.1 Product type as percentage of all product used by crop group, Scotland 2004

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 spec	all grass	all crops and grass
Calcium Ammonium Nitrate	0.0	0.6	0.0	0.0	1.4	2.0	0.5	0.1	0.0	0.3	0.0	0.1	0.3
Urea	4.4	5.4	0.0	0.0	9.4	0.2	4.9	1.5	0.3	0.9	0.0	1.4	3.1
Ammonium Nitrate	19.0	42.3	1.4	0.0	46.5	7.7	29.3	12.5	14.2	9.6	17.1	12.4	20.6
Urea Ammonium Nitrate	0.3	3.6	6.1	0.0	0.4	0.0	1.9	0.0	0.0	0.1	0.0	0.0	0.9
Other Straight N	4.4	6.3	1.2	0.0	3.8	0.0	4.8	0.2	0.2	0.1	0.0	0.2	2.4
Triple Superphosphate	0.0	0.4	0.0	0.0	0.3	0.0	0.2	0.4	0.7	0.2	13.3	0.3	0.3
Single Superphosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Other Straight P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muriate of Potash	0.6	1.8	1.9	0.0	0.5	0.1	1.1	0.2	0.0	0.5	0.0	0.2	0.6
Other Straight K	0.0	0.0	0.0	0.0	0.0	2.1	0.1	0.2	0.0	0.4	0.0	0.2	0.1
NP	0.7	0.8	3.1	0.0	2.6	1.1	1.1	4.7	5.2	3.4	0.0	4.1	2.7
NK	0.7	3.2	0.0	0.0	1.3	0.8	1.7	1.9	0.7	3.6	0.0	1.9	1.8
PK	3.9	14.4	0.0	0.0	3.1	10.1	7.9	4.0	2.0	3.1	0.0	4.0	5.8
Very High N	2.2	1.7	0.0	0.0	0.0	0.7	1.7	43.5	30.0	36.0	0.0	42.6	22.9
High N	12.9	1.5	0.0	0.0	3.1	6.8	6.7	25.0	36.2	35.8	34.3	27.0	17.2
High P	1.3	1.5	1.4	0.0	0.0	29.6	2.1	0.0	0.0	0.0	0.0	0.0	1.0
High K	13.0	2.2	44.8	0.0	0.8	13.3	9.3	0.6	0.5	1.2	0.0	0.6	4.8
Low N	12.8	13.0	38.9	0.0	16.5	12.0	14.5	1.1	1.9	1.2	0.0	1.1	7.5
Low P	3.7	0.0	0.0	0.0	0.0	2.9	1.7	1.7	3.7	2.8	0.0	1.7	1.7
Equal NPK	19.9	1.3	1.2	0.0	10.0	10.7	10.5	2.2	4.4	1.0	35.2	2.1	6.1
Total Product ('000 tonnes)	**156**	**138**	**18**	**0**	**33**	**11**	**357**	**337**	**14**	**164**	**1**	**384**	**741**

Source: British Survey of Fertiliser Practice 2004

Table SC3.2 Use of product type by crop group, Scotland 2004

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 spec	all grass	total product (000 tonnes)
Calcium Ammonium Nitrate	3.6	41.2	0.0	0.0	22.9	10.2	78.0	22.0	0.0	22.0	0.0	22.0	2
Urea	30.0	32.9	0.0	0.0	13.7	0.1	76.7	22.9	0.2	6.1	0.0	23.3	23
Ammonium Nitrate	19.5	38.3	0.2	0.0	10.2	0.5	68.6	27.6	1.3	10.3	0.1	31.4	152
Urea Ammonium Nitrate	7.6	72.6	16.2	0.0	1.9	0.0	98.5	0.0	0.0	1.5	0.0	1.5	7
Other Straight N	38.2	48.5	1.2	0.0	8.0	0.0	95.9	3.0	0.2	0.9	0.0	4.1	18
Triple Superphosphate	0.0	29.1	0.0	0.0	5.3	0.0	34.4	61.4	5.1	13.7	4.2	65.6	2
Single Superphosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0
Other Straight P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	19.2	52.2	7.2	0.0	3.4	0.1	82.1	17.1	0.0	17.1	0.0	17.9	5
Other Straight K	0.0	0.0	0.0	0.0	0.0	25.0	25.0	75.0	0.0	75.0	0.0	75.0	1
NP	5.9	5.5	2.9	0.0	4.4	0.6	19.3	80.7	3.8	28.1	0.0	80.7	20
NK	8.3	33.2	0.0	0.0	3.4	0.7	45.6	47.2	0.7	44.7	0.0	54.4	13
PK	14.0	46.0	0.0	0.0	2.4	2.5	64.9	31.4	0.7	11.7	0.0	35.1	43
Very High N	2.1	1.4	0.0	0.0	0.0	0.0	3.5	86.5	2.5	34.8	0.0	96.5	170
High N	15.7	1.6	0.0	0.0	0.8	0.6	18.7	66.2	4.0	45.9	0.2	81.3	128
High P	27.0	26.5	3.4	0.0	0.0	41.4	98.4	1.6	0.0	0.0	0.0	1.6	8
High K	57.3	8.5	23.2	0.0	0.8	4.0	93.7	6.1	0.2	5.7	0.0	6.3	35
Low N	35.6	32.1	12.8	0.0	9.9	2.3	92.8	6.8	0.5	3.5	0.0	7.2	56
Low P	45.0	0.0	0.0	0.0	0.0	2.4	47.4	45.1	4.1	35.6	0.0	52.6	13
Equal NPK	68.2	3.9	0.5	0.0	7.3	2.5	82.4	16.1	1.4	3.4	0.5	17.6	45
All Fertilisers	**21.1**	**18.7**	**2.5**	**0.0**	**4.6**	**1.5**	**48.4**	**45.3**	**1.9**	**22.0**	**0.1**	**51.6**	**741**

Source: British Survey of Fertiliser Practice 2004

Table SC3.3 Product use by month of application, Scotland 2004

row %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total Product (000 tonnes)
Calcium Ammonium Nitrate	0.0	19.9	12.8	21.1	24.2	0.0	22.0	0.0	0.0	0.0	0.0	0.0	2
Urea	0.0	2.6	18.4	35.2	34.0	2.0	5.5	1.3	0.0	1.0	0.0	0.0	23
Ammonium Nitrate	0.0	1.6	21.3	47.3	19.9	5.1	2.2	0.8	1.2	0.6	0.0	0.0	152
Urea Ammonium Nitrate	0.0	1.7	9.4	85.6	2.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7
Other Straight N	0.0	4.8	31.3	45.1	18.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	18
Triple Superphosphate	0.0	5.3	18.0	58.9	4.2	0.0	0.0	0.0	6.2	7.4	0.0	0.0	2
Single Superphosphate	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Other Straight P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Muriate of Potash	0.3	31.6	14.0	33.5	12.7	3.1	0.8	0.0	0.0	3.9	0.0	0.0	5
Other Straight K	0.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	25.0	1
NP	0.0	3.6	41.5	37.3	4.4	7.4	0.0	2.9	1.9	1.0	0.0	0.0	20
NK	0.0	6.6	25.8	17.3	16.1	24.6	9.4	0.0	0.1	0.0	0.0	0.0	13
PK	0.3	3.3	18.6	4.3	4.3	1.3	1.6	3.7	13.1	30.8	18.6	0.0	43
Very High N	0.0	0.2	9.6	40.8	16.1	14.7	12.5	5.4	0.7	0.0	0.0	0.0	170
High N	0.0	0.0	13.1	55.0	15.0	11.0	4.9	0.7	0.3	0.0	0.0	0.0	128
High P	0.0	0.0	28.0	13.0	32.5	0.0	0.0	0.0	26.2	0.3	0.0	0.0	8
High K	0.0	3.0	22.9	58.5	10.9	0.3	0.0	0.0	0.8	3.6	0.0	0.0	35
Low N	0.1	3.3	26.0	33.5	7.1	0.0	0.9	7.8	14.2	6.1	1.0	0.0	56
Low P	0.0	0.0	15.1	16.8	41.1	25.2	0.0	1.8	0.0	0.0	0.0	0.0	13
Equal NPK	0.0	0.3	31.9	43.8	6.1	8.0	0.2	3.7	3.1	2.8	0.0	0.0	45
All Fertilisers	**0.0**	**1.7**	**18.6**	**42.2**	**15.1**	**8.0**	**4.8**	**2.7**	**2.8**	**2.8**	**1.2**	**0.0**	**741**

Source: British Survey of Fertiliser Practice 2004

Table SC4.1 Average fertiliser practice, North East Scotland 2004

	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	-	-	-	-	-	-	-	-	-	-	0
Winter wheat	100	89	89	8	194	79	82	194	70	73	35
Spring barley	100	99	99	46	105	63	62	105	62	61	136
Winter barley	100	96	96	16	202	73	84	202	70	81	44
Oats	100	99	99	27	78	48	48	78	47	47	14
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	100	100	100	33	103	179	204	103	179	204	6
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	4
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	2
Winter oilseed rape	100	100	100	23	207	74	70	207	74	70	25
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	93	87	109	92	87	109	92	14
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	0
Arable silage/Other fodder crops	36	36	36	19	58	47	78	21	17	28	7
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	1
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	99	97	97	36	134	69	69	132	67	67	288
Grass under 5 years old	83	83	76	11	130	40	50	108	33	38	117
Grass 5 years and over	74	67	65	27	106	30	30	79	20	19	72
All grass	78	74	70	19	119	35	41	93	26	28	189
All crops and grass	88	85	82	27	126	53	56	111	45	46	477

Source: British Survey of Fertiliser Practice 2004

Table SC4.2 Average fertiliser practice, South East Scotland 2004

	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	81	81	3	142	57	77	142	46	62	10
Winter wheat	94	90	89	15	205	68	86	192	61	77	156
Spring barley	100	94	95	8	107	56	74	106	53	70	204
Winter barley	100	99	99	5	179	77	94	179	76	93	51
Oats	76	81	81	18	117	59	76	88	47	61	27
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Seed potatoes	86	86	86	22	130	173	204	111	148	175	14
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	100	99	99	13	111	101	149	111	100	147	19
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	100	100	100	0	139	54	70	139	54	70	6
Winter oilseed rape	100	87	86	1	220	56	59	220	49	50	28
Linseed	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	74	72	127	93	72	127	93	16
Leafy forage crops	48	68	68	48	90	73	71	43	50	48	14
Arable silage/Other fodder crops	60	56	60	0	87	40	54	53	22	33	5
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	3
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	4
Vegetable (other)	44	71	71	0	106	116	127	46	83	91	6
Soft fruit	100	100	100	27	31	38	54	31	38	54	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	90	90	11	148	65	82	139	58	74	580
Grass under 5 years old	88	72	66	14	105	38	50	93	27	33	153
Grass 5 years and over	71	63	55	6	87	34	34	61	21	18	211
All grass	78	67	60	9	95	36	41	74	24	24	364
All crops and grass	87	80	78	10	128	55	69	112	44	53	944

Source: British Survey of Fertiliser Practice 2004

Table SC4.3 Average fertiliser practice, South West Scotland 2004

	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	100	100	45	183	77	103	183	77	103	8
Spring barley	95	97	97	68	81	57	57	77	55	55	43
Winter barley	100	100	100	25	129	91	100	129	91	100	7
Oats	-	-	-	-	-	-	-	-	-	-	3
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	3
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	4
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	98	98	59	113	65	71	106	64	69	75
Grass under 5 years old	96	97	100	69	150	46	60	143	45	60	77
Grass 5 years and over	86	84	85	34	117	34	38	100	29	32	200
All grass	87	86	87	38	121	36	41	105	31	35	277
All crops and grass	87	87	88	40	120	38	43	105	33	38	352

Source: British Survey of Fertiliser Practice 2004

Table SC5.1 Average fertiliser practice on general cropping farms, Scotland 2004

	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	80	80	0	143	59	78	143	47	62	8
Winter wheat	95	90	89	12	207	69	85	196	62	76	149
Spring barley	100	98	99	20	112	62	73	112	61	72	210
Winter barley	100	97	97	4	204	81	92	204	79	90	62
Oats	77	81	81	17	120	62	78	92	50	63	24
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	2
Seed potatoes	90	90	90	26	120	173	207	108	155	186	18
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	94	94	94	7	151	137	170	142	128	159	22
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	100	100	100	0	180	77	82	180	77	82	11
Winter oilseed rape	100	92	92	4	219	64	65	219	59	60	43
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	77	95	136	119	95	136	119	8
Leafy forage crops	22	100	100	87	117	66	65	26	66	65	5
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	4
Peas - human consumption	0	0	0	0	0	0	0	0	0	0	6
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	4
Vegetable (other)	65	82	82	0	72	101	85	47	83	70	5
Soft fruit	100	100	100	27	31	38	54	31	38	54	5
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	96	93	94	15	154	70	82	147	65	77	589
Grass under 5 years old	73	59	60	3	111	37	47	80	22	28	79
Grass 5 years and over	62	49	48	2	117	31	36	72	15	17	83
All grass	67	54	54	2	113	34	42	76	18	23	162
All crops and grass	90	86	86	12	148	65	77	133	56	66	751

Source: British Survey of Fertiliser Practice 2004

Table SC5.2 Average fertiliser practice on dairy farms, Scotland 2004

	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	-	-	-	-	-	-	-	-	-	-	1
Winter wheat	100	100	91	89	185	78	100	185	78	91	7
Spring barley	91	97	97	77	70	57	63	63	55	61	14
Winter barley	-	-	-	-	-	-	-	-	-	-	1
Oats	-	-	-	-	-	-	-	-	-	-	1
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	1
Rootcrops for stockfeed	-	-	-	-	-	-	-	-	-	-	1
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	0
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	0
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	98	95	84	111	64	74	105	63	70	27
Grass under 5 years old	100	93	98	78	150	55	75	150	51	74	34
Grass 5 years and over	98	92	95	49	171	42	48	167	39	46	65
All grass	98	92	96	56	165	46	55	163	42	53	99
All crops and grass	98	93	96	59	161	47	57	158	44	55	126

Source: British Survey of Fertiliser Practice 2004

Table SC5.3 Average fertiliser practice on mixed farms, Scotland 2004

	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	86	97	12	148	82	93	148	71	90	43
Spring barley	100	90	90	42	91	57	60	91	51	54	89
Winter barley	100	98	98	24	159	63	82	159	62	81	34
Oats	100	97	97	21	57	30	30	57	29	29	12
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	0
Seed potatoes	-	-	-	-	-	-	-	-	-	-	2
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	2
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	1
Winter oilseed rape	100	92	84	53	197	60	40	197	56	33	12
Linseed	-	-	-	-	-	-	-	-	-	-	2
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	84	74	115	97	74	115	97	13
Leafy forage crops	-	-	-	-	-	-	-	-	-	-	3
Arable silage/Other fodder crops	-	-	-	-	-	-	-	-	-	-	3
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	2
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	1
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	2
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	99	91	92	36	110	62	68	109	57	63	223
Grass under 5 years old	92	86	79	13	112	37	47	103	32	37	101
Grass 5 years and over	80	71	64	20	89	25	31	71	18	20	75
All grass	86	78	71	16	101	32	39	87	25	28	176
All crops and grass	90	83	79	24	105	44	52	95	36	41	399

Source: British Survey of Fertiliser Practice 2004

Table SC5.4 Average fertilser practice on farms in Less Favoured Areas, Scotland 2004

	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	-	-	-	-	-	-	-	-	-	-	1
Winter wheat	-	-	-	-	-	-	-	-	-	-	1
Spring barley	99	99	99	62	87	51	56	86	51	55	84
Winter barley	100	100	100	94	127	77	77	127	77	77	5
Oats	100	100	100	36	67	48	55	67	48	55	6
Rye/Triticale/Durum wheat	-	-	-	-	-	-	-	-	-	-	1
Seed potatoes	-	-	-	-	-	-	-	-	-	-	0
Early potatoes	-	-	-	-	-	-	-	-	-	-	0
2nd Early/Maincrop potatoes	-	-	-	-	-	-	-	-	-	-	0
Sugar beet	-	-	-	-	-	-	-	-	-	-	0
Spring oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Winter oilseed rape	-	-	-	-	-	-	-	-	-	-	0
Linseed	-	-	-	-	-	-	-	-	-	-	0
Forage maize	-	-	-	-	-	-	-	-	-	-	0
Rootcrops for stockfeed	100	100	100	77	86	128	90	86	128	90	14
Leafy forage crops	62	62	62	41	75	75	71	46	47	44	9
Arable silage/Other fodder crops	26	26	26	26	40	40	40	10	10	10	5
Peas - human consumption	-	-	-	-	-	-	-	-	-	-	0
Peas - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Beans - animal consumption	-	-	-	-	-	-	-	-	-	-	0
Vegetables (brassicae)	-	-	-	-	-	-	-	-	-	-	0
Vegetable (other)	-	-	-	-	-	-	-	-	-	-	0
Soft fruit	-	-	-	-	-	-	-	-	-	-	0
Top fruit	-	-	-	-	-	-	-	-	-	-	0
Other tillage	-	-	-	-	-	-	-	-	-	-	0
All tillage	94	96	96	60	86	57	59	81	55	56	126
Grass under 5 years old	90	83	77	27	119	40	50	108	33	38	154
Grass 5 years and over	77	75	73	24	94	32	32	72	24	24	276
All grass	80	77	74	25	100	34	36	80	26	27	430
All crops and grass	81	79	76	28	99	36	39	80	29	29	556

Source: British Survey of Fertiliser Practice 2004

SECTION D

SUPPLEMENTARY SURVEY ANALYSIS ON THE USE OF ORGANIC MANURES

Introduction

General and supplementary information is collected for each farm holding that is surveyed. The supplementary questions vary each year. Whilst the British Survey of Fertiliser Practice is principally concerned with the application of manufactured fertilisers some information on the use of organic manures is also collected each year. In the 2003 and 2004 surveys more detailed information on timing of organic manure applications was collected and additional questions were asked about imports and exports of manures.

D1. Farms handling organic manures

Organic manures applied to agricultural land may be produced on farm by livestock as slurries, farm yard manure (FYM) and poultry manures. Or they may be imported from other sources such as treated sewage sludges (also called bio-solids) and some industrial 'wastes' such as paper waste or blood from abattoirs. Of the 1359 farmers in the survey 965 used organic manures on at least one field on the farm, the details are shown in Table D1.1

Table D1.1 Numbers and percentage (%) of farmers using each type of manure

manure type	*none*	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler/turkey manure*	*duck manure*	*other*
Number	394	811	266	32	23	48	19	29	3	54
%	29	60	20	2	2	4	1	2	0	4

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

Of the 394 farmers who did not spread manure, five had had livestock manure, but exported it all, so that there was none left to spread. Details of manure exports are given in Table D1.2.

Table D1.2 Percentage of farmers using the most common means of receiving information about the revision by farm type

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*broiler/turkey manure*	*duck manure*	*total*
No. of farms exporting manure type	16	6	2	3	1	1	0	2	31
Amount exported (tonnes or m^3)	5610	3200	10680	1366	80	450	0	110	21496
Average per farm (tonnes or m^3)	351	533	5340	455	80	450	0	55	693

Note: some farmers exported more than one type of manure

This indicates that only 29 (2%) of the farmers surveyed exported manures and that cattle FYM is exported most often, although the amount exported is greatest for pig FYM where two farms export a large amount.

Of the 965 farmers who used manure, 115 had imported some/all of it; the details are given in Table D1.3.

Table D1.3a Number of farmers importing farm manures (solids and liquids), showing quantity imported

manure type	*cattle FYM*	*pig FYM*	*cattle slurry*	*pig slurry*	*sheep manure*	*duck manure*	*layer manure*	*broiler/turkey manure*	*total*
No. of farms importing manure type	17	8	6	2	1	0	7	24	65
Amount imported (tonnes or m³)	6710	2850	7314	841	120	0	4240	7315	29390
Average per farm (tonnes or m³)	395	356	1219	421	120	0	606	305	452

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

manure type	*sewage sludge*				*composted green manure*	*other*	*total*
	digested liquid	*digested cake*	*thermally dried*	*lime stabilised*			
No. of farms importing manure type	2	23	5	10	2	10	50
Amount imported (tonnes or m³)	1488	21742	3560	12668	3000	11812	52782
Average per farm (tonnes or m³)	744	945	712	1267	1500	1181	1056

Note: some farmers imported more than one type of manure.

The amount of imported non-farm manures was more than double that in 2003, mainly due to increases in digested cake and lime stabilised sewage sludges. Cattle FYM and poultry manure continued to be the farm produced manures most likely to be imported.

For liquid organic manure applications during the current season the most common method of application is broadcasting (Table D1.4). Looking specifically at cattle and pig slurry applications bandspreading is more likely to be used for pig slurry than cattle slurry (Table D1.5) whilst rain guns are most often used when both types of slurry are spread on the same farm.

Table D1.4 Number and percentage (%) of farms using each type of application method where any slurry was applied, by country and robust type

robust type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating bloom*
England & Wales							
1 Cereals	21	76.2	17.6	1.0	0.0	5.2	0.0
2 General cropping	8	100.0	0.0	0.0	0.0	0.0	0.0
4 Pigs and poultry	3	34.0	3.3	25.0	0.0	32.7	5.0
5 Dairy	138	91.0	3.6	2.3	0.7	1.9	0.6
6 Cattle and sheep	78	94.7	3.7	0.0	0.0	1.3	0.3
7 Sheep and cattle (lowland)	41	84.6	6.1	0.0	1.5	2.4	5.4
8 Mixed	30	82.8	8.8	3.3	0.0	0.0	5.0
Scotland							
1 Cereals	2	100.0	0.0	0.0	0.0	0.0	0.0
2 General cropping	3	100.0	0.0	0.0	0.0	0.0	0.0
5 Dairy	14	96.4	2.1	0.0	0.0	0.0	1.4
6 Cattle and sheep	28	93.8	6.3	0.0	0.0	0.0	0.0
7 Sheep and cattle (lowland)	3	100.0	0.0	0.0	0.0	0.0	0.0
8 Mixed	6	100.0	0.0	0.0	0.0	0.0	0.0

Table D1.5 Number and percentage (%) of farms using each type of application method, by slurry type

slurry type	*number of farms*	*broadcast*	*band spread*	*shallow injection*	*deep injection*	*rain gun*	*rotating bloom*
Cattle slurry	236	92.6	2.7	0.9	0.4	1.5	1.9
Pig slurry	14	80.0	12.9	5.4	0.0	0.7	1.1
Both	9	80.2	8.9	0.0	0.0	10.9	0.0
Total	**250**	**91.9**	**3.2**	**1.2**	**0.4**	**1.5**	**1.9**

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. Table D1.6 shows the best estimate of incorporation using information for the current season recorded. Details about how quickly manures were incorporated (Table D1.7) shows that over 50% of poultry manure is incorporated within 24 hours, whilst only 20% of FYM and 25% of slurry is incorporated this quickly.

Table D1.6 Degree of incorporation of organic manures/slurries applied in current season

manure type	*% of farms incorporating manure/slurry*	*% of all applied manure/slurry being incorporated*
FYM	59	84
Poultry manure	72	77
Slurry	60	36
Total	**59**	**72**

Table D1.7 Frequency of incorporation time by manure/slurry type

	number of farms incorporation time				
	</= 6 hours	*6-24 hours*	*1 day - 1 week*	*> 1 week*	*total*
FYM	13	87	274	124	498
Poultry manure	2	11	9	2	24
Slurry	6	19	45	30	100

Farmers were asked to indicate what proportion of their livestock manures had been spread by a contractor. On farms that had used a contractor, 84% of the poultry manure was spread in this way, this represents 37% of the poultry manure spread in the current season (Table D1.8). FYM and slurry were less likely to be spread by a contractor.

Table D1.8 Use of contractors to spread manure/slurry in current season

manure type	*% of slurry/manure type sread by contractors where contractors are used*	*% of total slurry/manure type spread by contractors*
FYM	75	22
Poultry manure	84	37
Slurry	51	17

D2. Use of organic manures

At a field level farmers were asked about how often fields received organic manures. Of the 10315 fields belonging to farms who used manures, 3240 fields (31%) never received manure, for those that had received manure in the past, the average frequency of application is shown in Table D2.1.

Table D2.1 Average number of years between organic manure applications

	1 year	*2 years*	*3 years*	*4 years*	*5 years*	*6 years*	*>6 years*	*never*	*don't know*
% of fields	16	6	6	7	6	3	19	31	5

For the 3883 fields that received organic manures in the 2003/04 season, data were collected on what type was applied. The proportion of fields receiving each of the main types of manure is shown in Table D2.2.

Table D2.2 Percentage of fields receiving each organic manure type

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep FYM*	*layer manure*	*duck manure*	*broiler/turkey manure*	*other*
% of fields	59	28	2	3	2	1	1	2	3

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

The rate of application of manure was described as low, medium or high using the guidelines in Table D2.3. and the results are shown in Table D2.4

Table D2.3 Typical rates of manure application

manure type	*units*	*typical application rates*		
		low	*medium*	*high*
manure:				
pig	t/ha	<15	15-30	>30
cattle/sheep	t/ha	<15	15-30	>30
poultry layer	t/ha	<6	6-11	>11
broiler/turkey litter	t/ha	<4	4-7	>7
slurry:				
pig	m^3/ha	<25	25-45	>45
dairy/beef/sheep	m^3/ha	<35	35-65	>65
sewage sludge:				
liquid digested	m^3/ha	<55	55-100	>100
cake digested	t/ha	<15	15-25	>25
thermally dried	t/ha	<4	4-7	>7
lime-stabilised	t/ha	<15	15-25	>25
other:				
strainer box	m^3/ha	<70	70-135	>135
weeping wall	m^3/ha	<55	55-100	>100
dirty water	m^3/ha	<440	440-800	>800

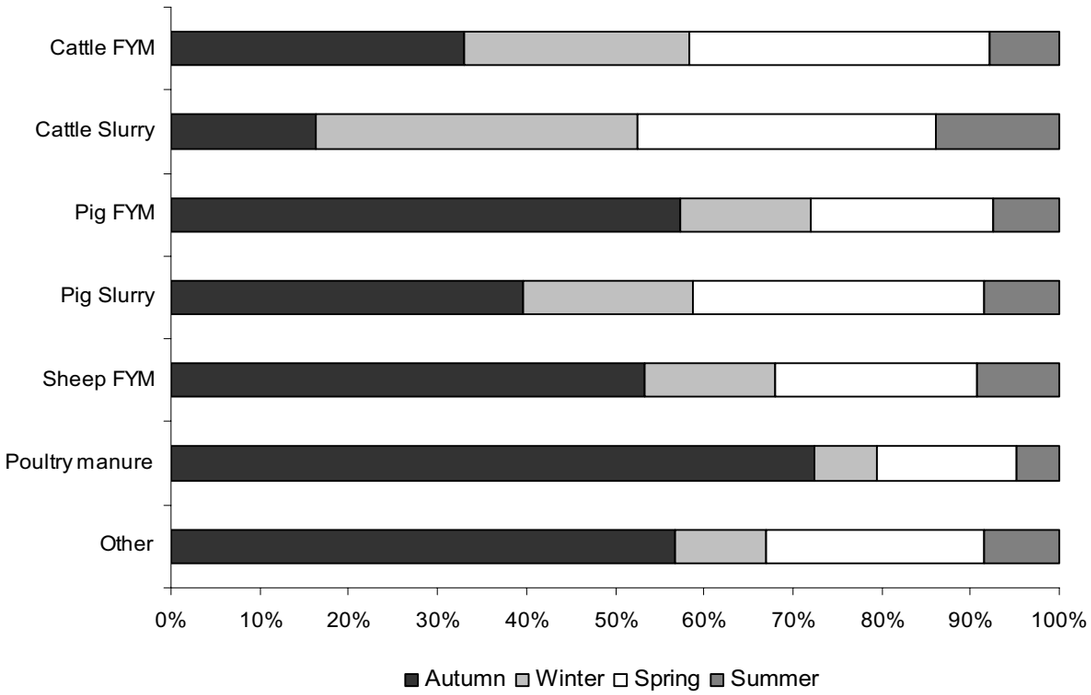
Table D2.4 Number of fields receiving low, medium or high rates of each organic manure type

manure type	*cattle FYM*	*cattle slurry*	*pig FYM*	*pig slurry*	*sheep manure*	*layer manure*	*duck manure*	*broiler/turkey manure*	*other*	*total*
Low	832	541	23	73	48	26	0	18	52	1613
Medium	1137	465	33	42	20	10	109	32	52	1900
High	246	60	12	16	7	1	3	11	14	370
Total	**2215**	**1066**	**68**	**131**	**75**	**37**	**112**	**61**	**118**	**3883**

Over all manure types over 40% of applications were described as low and nearly 50% as medium. Of the individual manure types pig FYM and broiler/turkey manure were most likely to be applied at high rates (18%).

The time of year when manure was applied is shown in Figure D2.1. Excluding cattle manures most fields (56%) received manures in the autumn. This is in direct contrast to the 2002/03 season when in general spring applications were as frequent as those made in the autumn. This may reflect the drier weather during October in 2003 compared with 2002. For cattle slurry more applications were made in the winter and spring than the autumn, whilst for cattle FYM applications were similar in autumn, winter and spring.

Figure D2.1 Percentage of fields receiving each organic manure type by season



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 be reduced[16]. 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 which did not. Table D3.1 shows the overall fertiliser rates for the main tillage crops in Great Britain with and without manure inputs. (Organic farms, which use no mineral fertilisers, have been excluded from the Table D3.1 and D3.2.)

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

	nitrogen		*phosphate*		*potash*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
Winter wheat	191	199	30	40	49	48
Spring barley	93	109	46	44	53	59
Winter barley	133	147	50	45	65	62
2nd early or maincrop potatoes	172	149	125	128	243	188
Sugar beet	98	95	22	41	94	108
Spring oilseed rape	140	135	10	46	9	47
Winter oilseed rape	177	215	23	41	34	48
Field peas (harvested dry)	7	2	22	18	36	28
Field beans (harvested dry)	0	4	10	25	31	32
Forage maize	46	93	39	56	42	72

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

The application of organic manures had an effect on whether fields received phosphate or potash fertiliser, the dressing covers reducing by about 25% (phosphate) and 10% (potash) for beans, sugar beet and oilseed rape (winter and spring sown). There was little impact on dressing cover for nitrogen.

In terms of overall application rate there was a reduction in fertiliser applications where manures were used for over half the crops. The largest nitrogen reduction occurred with forage maize (this was also the only crop where the number of fields receiving organic manures was greater than the number without) followed by winter oilseed rape. Nitrogen use on cereals was also lower, but for potatoes and sugar beet it was higher where manures were used. The largest reduction in phosphate and potash use occurred with spring oilseed rape. For potash there was also a large reduction for forage maize. The results for arable crops are similar to those for the period 1994-1996 as reported by Chalmers (2001).

Table D3.2 Average field rate of fertiliser application on grassland in England & Wales and in Scotland, with and without applications of organic manure

	nitrogen		*phosphate*		*potash*		*number of fields*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
England & Wales								
Dairy								
Grass less than five years old	177	218	31	61	56	79	168	65
Grass five years and over	145	150	29	30	47	38	341	170
All grass	154	164	29	35	50	47	509	235
Cattle and sheep								
Grass less than five years old	108	109	35	39	48	56	103	99
Grass five years and over	79	70	26	23	29	23	526	534
All grass	82	74	27	24	31	26	629	633
Other livestock								
Grass less than five years old	129	178	27	45	47	66	27	89
Grass five years and over	93	115	21	30	25	34	34	155
All grass	109	132	23	35	34	46	61	244
Scotland								
Dairy								
Grass less than five years old	154	136	59	41	77	68	22	12
Grass five years and over	199	143	49	36	58	39	40	25
All grass	183	142	52	37	65	43	62	37
Mixed								
Grass less than five years old	143	109	50	36	61	44	64	181
Grass five years and over	115	85	37	29	41	29	90	230
All grass	123	92	40	31	47	33	154	411

[16] 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.

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 the 'Robust farm types') 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.

In England & Wales 68% of all grass fields in the dairy sector had received manure, 82% of fields cut for silage received manures. The difference in the average fertiliser rate on dairy grassland with or without manure was relatively small except on short term grass (<five years old). On cattle and sheep farms the number of fields receiving manure was similar to those not receiving manure. There was little difference in the average rate of nitrogen, phosphate and potash fertiliser whether or not manure was used. For mixed livestock farms the number of fields receiving manures was fewer than the fields without manure. Mineral fertiliser inputs were consistently lower on those fields that had received manure.

In Scotland (as in England & Wales) fields on dairy farms are more likely to receive manure than those on other farm types with 63% of grass fields on dairy farms receiving manure compared with 27% on mixed farms. Irrespective of farm type, mineral fertiliser inputs were consistently higher on those fields that had received manure.

As so many fields on dairy farms receive manure a separate analysis was carried out to examine the influence of grass management (Table D3.3). This shows that in both England & Wales and Scotland fields cut for silage are most likely to receive manures. In England & Wales smaller dressings of mineral fertiliser were made to silage fields that received manure. For grazed grass the amount of potash fertiliser was lower in the presence of manure in Scotland but not in England & Wales.

Table D3.3 Average field rate of fertiliser application on dairy grassland in England & Wales and in Scotland, with and without applications of organic manure

	nitrogen		*phosphate*		*potash*		*number of fields*	
	with manure	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*	*with manure*	*no manure*
England & Wales								
All hay	117	116	29	54	44	66	44	22
All silage	163	187	30	54	60	77	301	68
All grazings	152	163	29	32	47	42	457	221
Scotland								
All hay	79	63	30	31	41	31	1	1
All silage	181	119	56	54	77	87	38	8
All grazings	178	146	48	36	60	41	53	34

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. Thus some of the differences between mineral fertiliser inputs categorised as with or without manures are less than might have been expected, although the extent to which individual farmers have accounted for the nutrients in the manures cannot be judged from these data. However when making these comparisons there are a number of factors which should be taken into account:

- 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 field 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 data set 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
- over a third of cattle/pig FYM applications were reported as <15 t/ha and over a third were applied in the autumn. A 15 t/ha dressing of cattle FYM applied to cereal stubble in the autumn will only supply 5-9 kg/ha of available nitrogen depending on soil type

D4. Spreading precision and record keeping

Precision in spreading both fertilisers and manures is important both for profitability and to minimise pollution. 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.

About a third of farmers check the accuracy of mineral fertiliser spreaders with catch trays on an annual basis (Table D4.1), with 7% checking at each change of fertiliser type. Sixty percent of farmers took active measures to prevent contamination of water courses, ditches and hedgerow bottoms when spreading mineral fertiliser.

Table D4.1 Frequency of spread pattern checks using a catch tray

	percentage
Not answered	18
At each change of fertiliser type	7
Once a year	32
Less than once a year	17
It is factory set & doesn't need checking	27

Computers and farm notebooks were the most common methods for recording fertiliser use (Table D4.2), whilst farm diaries were the most common method for organic manures. No fertiliser records were kept on 13% of farms; this compares with 22% in 2001 when this question was last asked in the survey.

Table D4.2 Record keeping methods for fertiliser and manure applications on farms where each respective nutrient type was applied during the 2003 - 2004 crop year

method	*applied fertiliser*		*applied organic manure*	
	number	*percentage*	*number*	*percentage*
Farm diary	443	35	196	20
Farm notebook	560	44	117	12
File record sheet	454	36	92	10
Computer programme	576	46	104	11
Other paper record	94	7	22	2
No records kept	231	18	118	12
Not answered	44	3	386	40
Total farms	**1261**	**100**	**965**	**100**

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 2004

Great Britain

	standard error for overall application rate (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	1.4	1.7	2.4	2.5	4.2	1.1	1.5	2055
oilseed rape	3.3	3.6	1.7	1.9	2.3	3.3	3.3	4.4	1.7	2.2	514
winter barley	2.5	3.1	1.9	1.6	2.1	2.4	2.4	3.8	1.3	1.8	628
spring barley	2.0	2.5	1.9	1.4	1.7	1.8	2.3	1.7	1.2	1.5	792
m/c potatoes	7.4	6.2	8.1	8.4	11.3	6.8	9.1	7.7	7.9	10.2	144
sugar beet	4.5	4.6	2.5	4.2	7.4	4.1	3.9	8.7	5.7	7.0	192
all tillage crops	2.1	2.5	1.2	1.0	1.3	2.1	2.3	1.9	1.1	1.5	5524
all grass	2.2	1.7	1.6	0.6	0.8	2.2	2.9	1.9	0.8	1.1	3816

England & Wales

	standard error for overall application rate (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	2.7	3.2	1.6	1.4	1.8	2.6	2.7	5.0	1.2	1.7	1855
oilseed rape	3.7	4.0	1.8	2.0	2.6	3.6	3.6	6.0	1.9	2.6	457
winter barley	2.6	3.3	2.0	1.7	2.3	2.5	2.6	4.6	1.4	2.1	526
spring barley	2.7	3.5	2.6	1.7	2.3	2.5	3.0	2.9	1.7	2.2	395
m/c potatoes	8.1	6.8	9.1	9.2	12.5	7.4	9.5	8.6	8.6	11.0	120
sugar beet	4.5	4.6	2.5	4.2	7.4	4.1	3.9	8.7	5.7	7.0	192
all tillage crops	2.3	2.9	1.3	1.2	1.5	2.4	2.5	2.6	1.3	1.9	4559
all grass	2.4	1.9	1.6	0.6	0.9	2.6	3.3	2.1	0.9	1.3	2949

Scotland

	standard error for overall application rate (kg/ha)					standard error for average field rates (kg/ha)					fields in sample
	total N	strt N	comp N	total P_2O_5	total K_2O	total N	strt N	comp N	total P_2O_5	total K_2O	
winter wheat	6.1	7.4	4.8	3.5	4.2	5.7	6.1	7.1	2.6	3.5	200
oilseed rape	7.5	7.5	4.9	4.2	4.5	7.5	6.5	5.4	3.6	4.0	67
winter barley	7.1	8.7	5.5	3.3	4.0	7.1	7.2	6.7	2.6	3.2	102
spring barley	2.8	3.4	2.3	1.7	2.0	2.6	3.1	2.0	1.5	1.9	397
m/c potatoes	17.5	13.7	16.9	21.2	25.8	16.4	29.0	16.5	20.6	24.8	24
all tillage crops	3.9	4.5	2.2	1.7	2.0	3.8	4.7	2.0	1.8	2.0	965
all grass	4.7	3.3	4.1	1.6	1.8	4.3	6.5	3.9	1.6	1.8	867

App 1.2 ESTIMATING THE STANDARD ERROR

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.

App 1.3 AN ALTERNATIVE APPROACH TO ESTIMATION OF OVERALL RATES

It is in the nature of random sampling that the characteristics of each achieved sample will differ in several respects from one another, and from the underlying population. In particular, the proportion of different crops grown will differ in the achieved sample from that in the population. The method of adjustment used here in these alternative estimates attempts to counter this by 'post-stratifying' or 'weighting' by the distribution of area of the major crops reported to the Agricultural Census (June 2004).

Table App 1.2 Re-estimation of overall total fertiliser use (kg/ha), Great Britain 2004

		straight nitrogen	compound nitrogen	total nitrogen	total phosphate	total potash
all tillage		132	20	152	41	55
	revised estimate	128	20	148	41	57
all grass		27	50	77	17	22
	revised estimate	27	51	78	18	23
all crops and grass		73	37	110	28	37
	revised estimate	70	38	107	28	37

App 1.4 RESPONSE RATE

Tables App 1.3 and App 1.4 summarise information regarding the response received to the main and reserve samples.

Table App 1.3 Response to main and reserve samples in 2004

	2004	% total
Issued from main sample	1617	100
Non-response[1]	437	13
Response to main sample	1180	87
Issued from reserve sample 1	437	27
Non-response[1]	335	21
Response to reserve sample 1	102	6
Issued from reserve sample 2	335	21
Non-response[1]	292	18
Response to reserve sample 2	43	3
Issued from reserve sample 3	292	18
Non-response[1]	257	16
Response to reserve sample 3	35	2
Achieved sample response	1360	84

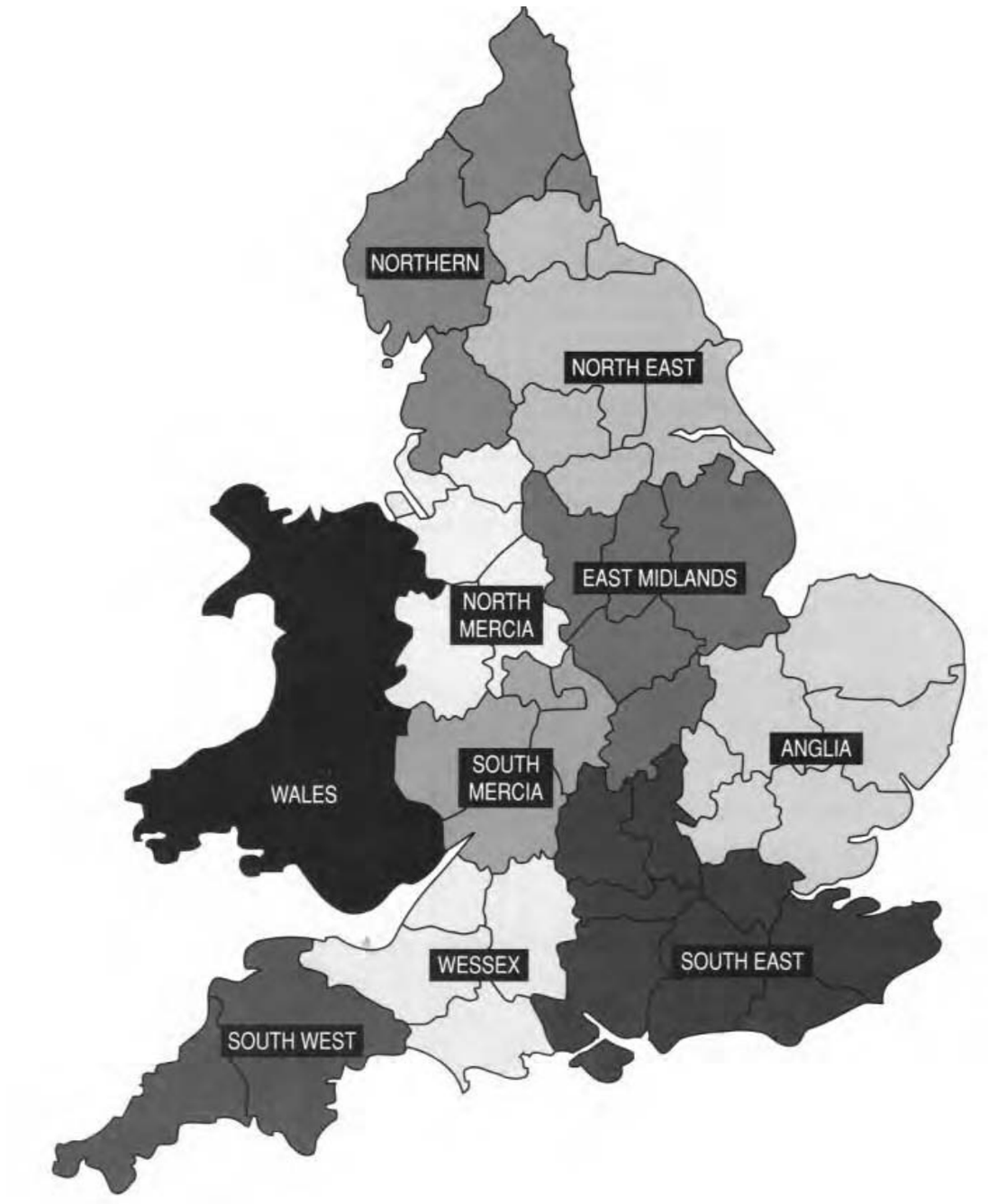
Table App 1.4 Response to main and reserve samples for 2000 - 2004

Net response rate	2000 %	2001 %	2002 %	2003 %	2004 %
Overall achieved rate	94	89	91	84	84
Refusal rate[1]	7	11	9	16	16
Net response rate	**2000 %**	**2001 %**	**2002 %**	**2003 %**	**2004 %**
Main sample	67	72	77	71	87
Reserve sample(s)	45	28	23	29	13
Main reasons for refusal	**2000 %**	**2001 %**	**2002 %**	**2003 %**	**2004 %**
Too busy	31	23	31	38	23
Not interested	10	8	9	16	7
Do not do surveys	7	3	5	10	4
Want payment	2	1	1	1	1
Too much paperwork	3	2	1	3	1
Other[1]	49	63	54	32	64

[1] Includes non-contact

APPENDIX 2

App 2.1 BSFP REGIONS[18] IN ENGLAND AND WALES



[18] Defra administrative regions have been revised since April 1996 as a result of changes to county boundaries and nomenclature bought about by the introduction of unitary local authorities. The BSFP regions marked above are based on the 1995 MAFF administrative regions.

App 2.2 COMPARISON OF BSFP AND DEFRA COUNTIES

Approximate English counties within BSFP and Defra Regions[19]

BSFP REGIONS

NORTHERN
8 Cumbria
21 Lancashire
31 Northumberland
30 Tyne and Wear

NORTH-EAST
4 Cleveland
12 Durham
51 East Riding of Yorks and N Lincs
50 North Yorkshire (Beverley)
48 North Yorkshire (Northallerton)
47 South Yorkshire
49 West Yorkshire

NORTH MERCIA
6 Cheshire
44 Greater Manchester
25 Merseyside
35 Shropshire
37 Staffordshire

SOUTH MERCIA
14 Gloucestershire
17 Hereford and Worcester
43 Warwickshire
46 West Midlands

EAST MIDLANDS
9 Derbyshire
22 Leicestershire
24 Lincolnshire
29 Northamptonshire
32 Nottinghamshire

ANGLIA
1 Bedfordshire
5 Cambridgeshire
13 Essex
18 Hertfordshire
28 Norfolk
38 Suffolk

SOUTH-EAST
2 Berkshire
3 Buckinghamshire
41 East Sussex
26/27 Greater London
15 Hampshire
16 Isle of Wight
20 Kent
33 Oxfordshire
40 Surrey
42 West Sussex

WESSEX
11 Dorset
34 N Somerset and S Gloucestershire
36 Somerset
45 Wiltshire

SOUTH-WEST
7 Cornwall
10 Devon

Defra REGIONS

NORTHERN
4 Cleveland
8 Cumbria
12 Durham
51 East Riding of Yorks and N Lincs
50 North Yorkshire (Beverley)
48 North Yorkshire (Northallerton)
47 South Yorkshire
30 Tyne and Wear
49 West Yorkshire

MIDLANDS & WESTERN
6 Cheshire
9 Derbyshire
44 Greater Manchester
17 Hereford and Worcester
21 Lancashire
22 Leicestershire
25 Merseyside
32 Nottinghamshire
35 Shropshire
37 Staffordshire
43 Warwickshire
46 West Midlands

EASTERN
1 Bedfordshire
5 Cambridgeshire
13 Essex
26 Greater London (E)
18 Hertfordshire
24 Lincolnshire
28 Norfolk
29 Northamptonshire
38 Suffolk

SOUTH-EASTERN
2 Berkshire
3 Buckinghamshire
41 East Sussex
27 Greater London (SE)
15 Hampshire
16 Isle of Wight
20 Kent
33 Oxfordshire
40 Surrey
42 West Sussex

SOUTH-WESTERN
7 Cornwall
10 Devon
11 Dorset
39 Isles of Scilly
34 N Somerset and S Gloucestershire
14 Gloucestershire
36 Somerset
45 Wiltshire

[19] Defra Statistics Dept, Foss House, York and Office for National Statistics (ONS) Geography User Guide, http://www.ons.gov.uk

App 2.3 ENGLISH COUNTIES WITHIN BSFP AND DEFRA REGIONS

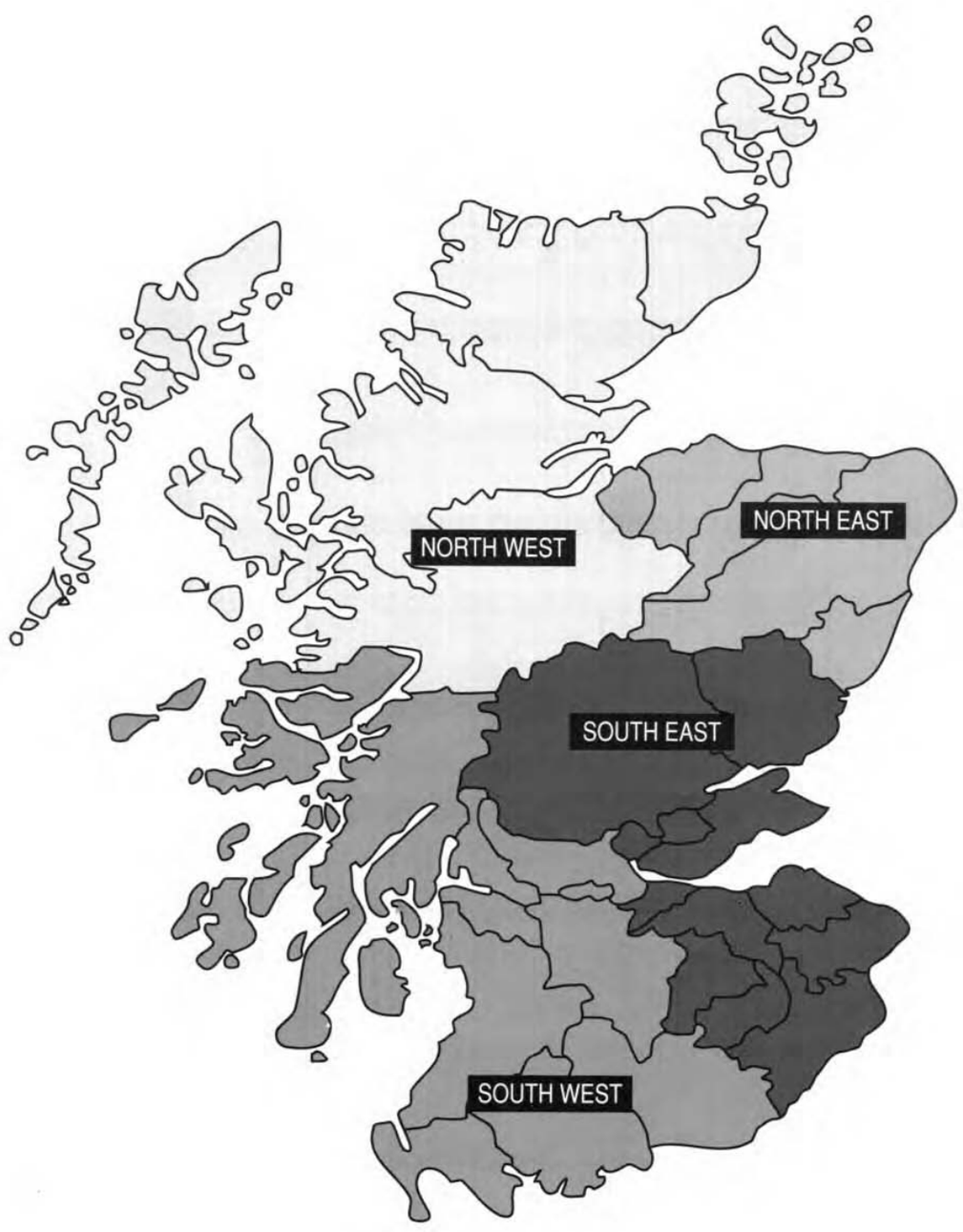
List of English counties indicating the BSFP and Defra Regions[20] within which they fall

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

[20] Defra Statistics Dept, Foss House, York and Office for National Statistics (ONS) Geography User Guide, http://www.ons.gov.uk

APPENDIX 3

App 3.1 BSFP REGIONS[21] IN SCOTLAND



[21] SEERAD administrative regions have been revised since April 1996 as a result of changes to county boundaries and nomenclature bought about by the introduction of unitary local authorities. The BSFP regions marked above are based on the 1995 SOAFD administrative regions.

APPENDIX 4

App 4.1 UK FARM CLASSIFICATION SYSTEM

UK farm classification system (Revised 1994): composition of robust, main and other types by constituent EC type[a, 22].

Robust types		Main types		Constituent EC types[a]
1	Cereals	1	Cereals	111, 1243, [1245]
2	General cropping	2	General cropping	121, 122, 123, [1244], 602, 603, 604, [6052]
3	Horticulture	3	Specialist fruit	321
		4	Specialist glass	2012, 2022, 2032
		5	Other horticulture	2011, 2013, 2021, 2023, 2034, 311, 312, 313, 314, 340, 601, 606
4	Pigs and poultry	6	Specialist pigs	501
		7	Specialist poultry	502
		8	Mixed pigs and poultry	503
5	Dairy	9	Dairy (LFA)[b]	411, 412 (LFA)
		10	Dairy (lowland)[b]	411, 412 (non-LFA)
6	Cattle and sheep (LFA)[b]	11	Specialist sheep (SDA)[b]	441 (SDA)
		12	Specialist beef (SDA)[b]	421, 422 (SDA)
		13	Mixed cattle and sheep (SDA)[b]	431, 432, 442, [4443] (SDA)
		14	Cattle and sheep (DA)[b]	421, 422, 431, 432, 441, 442, [4443] (DA)
7	Sheep and cattle (lowland)[b]	15	Cattle and lowland (sheep)[b]	421, 422, 431, 432, 441, 442
8	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, 823
		20	Mixed livestock	711, [7122], 721, 722, 723
9	Other[c]	21	Specialist mushrooms	2033
		22	Specialist set-aside	[1246]
		23	Specialist grass and forage	[1247], [4442], [6052], [7121], [8132], [8141]
		24	Specialist goats	443
		25	Specialist horses	[4441]
		26	Non-classified holdings: fallow	[91]
		27	Non-classified holdings: other	[92]

[a] 1985 EC Typology described in Commission Decision 85/377/EEC as amended with minor modifications to adapt it to UK conditions. These minor modifications are indicated by the EC farm type number being shown in square brackets. Definitions of these additional farm types are available from Defra Farm and Animal Health Economics Division, Ergon House, Horseferry Road, London SW1P 2AL. EC types 112, 113, 1241, 322, 323 and 330 have not been allocated in the classification, since these types of production do not occur in the UK.

[b] Definitions of LFA (Less Favoured Area), lowland, SDA (Severely Disadvantaged Area), and DA (Disadvantaged Area) farms are available on request from: Defra Farm and Animal Health Economics Division, Ergon House, Horseferry Road, London SW1P 2AL.

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

[22] MAFF 1999/2000, Farm incomes in the United Kingdom 1999/2000. MAFF Publications, London.