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## The British Survey of Fertiliser Practice Fertiliser use on farm for the 2014 crop year

The British Survey of Fertiliser Practice, which is carried out annually, provides information on usage and application rates of nitrogen, phosphate, potash, sulphur, organic manures and lime on the major crops and grass grown in mainland Britain.

This release gives key results from the 2014 survey. Full results and methodological details are published in a separate report [here](#).

### Key results

- In terms of weather conditions, the 2014 crop year was more typical than 2013 and saw a return to a more usual balance of winter and spring sown crops.
- The total nitrogen application rate on all crops and grassland increased by 5 kg/ha between 2013 and 2014 to 99 kg/ha. This increase was driven by a large 10 kg/ha rise in the overall nitrogen rates on tillage crops compared to the relatively low rate of 136 kg/ha in 2013 (the result of adverse weather conditions). 2014 also saw a larger area of winter crops which generally have higher nitrogen rates. Nitrogen applied to grassland is lower than tillage and was 60kg/ha in 2014, an increase of 1 kg/ha on 2013.
- Application rates of phosphate and potash on all crops and grassland were 18 and 25 kg/ha respectively in 2014, similar to rates in 2013. Rates have been relatively stable in recent years although the longer term trend has been downward, mainly due to a fall in the proportion of crops treated.
- The overall application rate for sulphur on tillage crops was 31 kg/ha in 2014, an increase of 4kg/ha on 2013 and the highest rate recorded in the last 5 years. Overall application rates on grass have been more stable, albeit with an increase from 2 kg/ha in 2013 to 4 kg/ha in 2014.
- Around 66% of farms in the survey used organic manures on at least one field on the farm. Cattle manure from beef and dairy farms is by far the largest volume of manure type used.

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## 1. Background

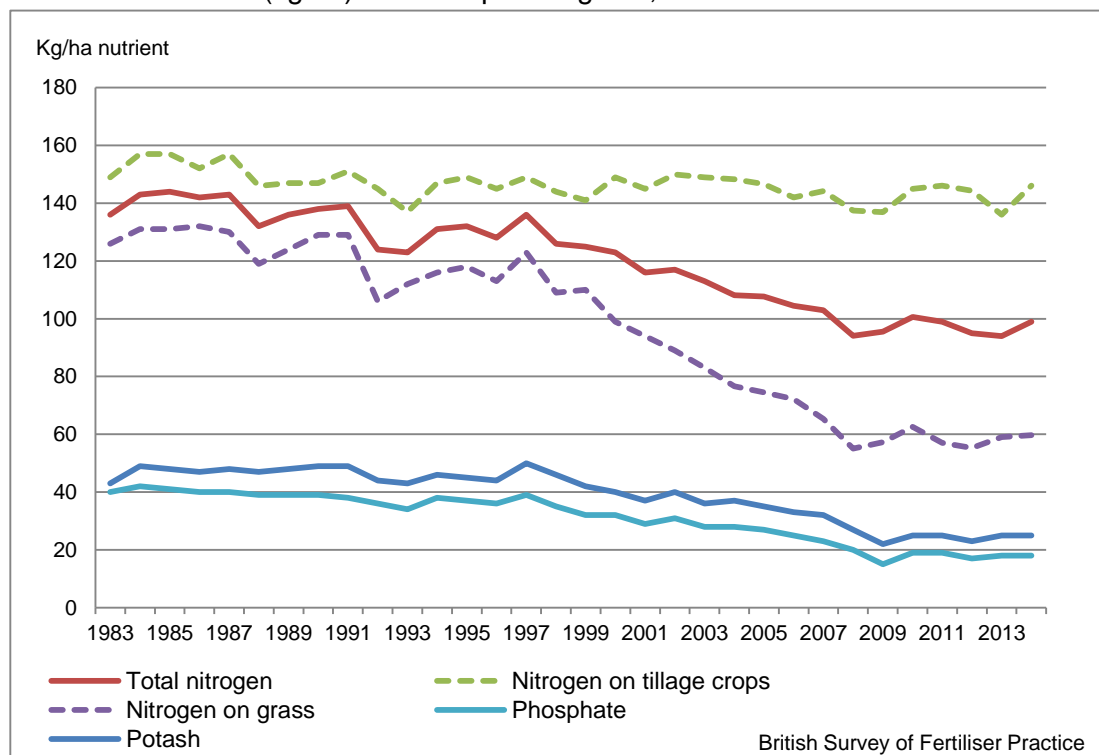
The British Survey of Fertiliser Practice (BSFP) is the primary source of data on inorganic and organic fertiliser use in Great Britain. Its main purpose is to estimate average application rates of nitrogen, phosphate and potash used for agricultural crops and grassland. Information is also collected on applications of sulphur fertilisers, organic manures and lime. The survey data are used by Government, industry and the wider agricultural community to monitor best practice, to assess potential environmental impacts and mitigation strategies and provide important evidence to estimate greenhouse gas emissions from agriculture to inform policy.

The full Report with detailed methodological information plus separate key datasets are available on the GOV.UK [website](#).

## 2. Overall fertiliser use on crops and grass in Great Britain

Figure 1 shows the overall application rates of nitrogen, phosphate and potash on crops and grass from 1983. In all cases there is a general downward trend. The 27% decline in total nitrogen over this period is mainly due to decreased use on grassland. This compares to a 55% reduction in overall rate for phosphate and a 42% decline for potash. The dip in use in 2009 is thought to have been caused by the major price increases for fertiliser at that time. In all cases the rate of application on tillage crops is higher than the rate applied to grassland. In 2014, the overall rate for nitrogen on all crops and grass is 99 kg/ha. For phosphate and potash the overall rates in 2014 are 18 kg/ha and 25 kg/ha respectively.

Figure 1: Overall fertiliser use (kg/ha) on all crops and grass, Great Britain 1983 - 2014



### 3. Nitrogen

Most agricultural soils do not contain enough naturally occurring plant available nitrogen to meet the needs of a crop throughout the growing season, so supplementary nitrogen applications are needed each year. Nitrogen usually has a large immediate effect on crop growth, yield and quality. Correct rate and timing of nitrogen fertiliser application is important to ensure it meets the crops growth requirements and that there is minimum risk of adverse environmental impacts as a result of the application.

The 5 kg/ha increase in total nitrogen use on all crops and grassland (Table 1) in 2014 is driven by a 10 kg/ha increase in the overall rates on tillage crops to 146 kg/ha. This rate is a return to the typical 145-150 kg/ha range seen over the majority of the 30 years of the survey. It is likely that the reversal of the 2013 swing to spring cropping (the result of adverse weather in that year) is a major factor in this.

Nitrogen rates on grassland have always been lower than tillage crops. Between 1983 and 1999 they were on average 27 kg/ha lower. However since 2000, grassland rates have consistently fallen and over the last five years the average difference has been 85 kg/ha. A reduction in total cattle numbers (by 13% between 2000 and 2014) is thought to have contributed to this, possibly in conjunction with some improvement in manure use efficiency. Overall nitrogen use on grass in 2014 increased by 1 kg/ha to 60 kg/ha. This is due to changes in the average field rates, with the proportion of grass area receiving straight and compound nitrogen remaining largely unchanged.

Table 1: Overall nitrogen use (kg/ha), Great Britain 2010 - 2014

	Tillage crops	Grass	All crops and grass
2010	145	63	101
2011	146	57	99
2012	144	55	95
2013	136	59	94
2014	146	60	99

### 4. Phosphate and potash

Phosphate and potash are applied in fertilisers and manures, particularly to replace the quantities removed in harvested crops. Most British soils can hold large quantities of these nutrients in forms that are available for crop uptake over several years. Consequently managing the supply of these nutrients for optimum yield is based more on maintaining appropriate levels in the soil according to crop rotation needs and the timing of application tends to be less critical than that for nitrogen or sulphur.

Table 2: Overall phosphate and potash use (kg/ha), Great Britain 2010 - 2014

Phosphate				Potash			
	Tillage crops	Grass	All crops and grass		Tillage crops	Grass	All crops and grass
2010	30	10	19	2010	38	14	25
2011	29	9	19	2011	39	12	25
2012	28	9	17	2012	37	12	23
2013	28	9	18	2013	40	13	25
2014	29	10	18	2014	39	14	25

Table 2 shows overall phosphate and potash application rates for the past five years. Overall, phosphate and potash use on all crops and grass has varied little over this period with rates on tillage crops about three times higher than those used on grassland.

On tillage crops overall phosphate application rates decreased gradually between 1984 and 1996. From 1997 the decline became more marked, dropping to 29 kg/ha in 2014; the third lowest rate since Great Britain records began. This picture varies across countries in Great Britain: in Scotland phosphate and potash application rates on tillage have been largely maintained (50 kg/ha and 67 kg/ha respectively in 2014) relative to the decrease seen in England and Wales. The overall application rate of phosphate on grassland was highest in 1983 at 28 kg/ha. It remained relatively stable between 1984 and 1998 then declined more rapidly from 1999 and, by 2014, stabilised at 10 kg/ha

In the longer term overall potash application rates on tillage crops fell slightly between 1983 and 1997, with rates in the range of 60-68 kg/ha. Like phosphate, overall application rates reduced at a greater rate after this, dropping to 33 kg/ha in 2009 when fertiliser prices were high. Between 2010 and 2014 overall potash application rates to tillage have been in the range 37-40 kg/ha. Whilst the pattern of use on grassland has been more variable, this has also shown a net decline between 1983 and 2014; overall potash rates were relatively stable at 31-33 kg/ha during the mid-late 1980s but, since then, have tended to decrease and have been in the range 12-14 kg/ha since 2008.

## 5. Sulphur

Sulphur is an essential plant nutrient. In the past demand was satisfied through atmospheric deposition but this has declined significantly. There is therefore a need for sulphur application to crops and grass, with crops such as oilseed rape being particularly sensitive to sulphur deficiency. This nutrient is often applied in the sulphate form together with nitrogen fertilisers.

Table 3: Overall sulphur use (kg/ha), Great Britain 2010 - 2014

	Tillage crops	Grass	All crops and grass
2010	23	2	12
2011	26	2	13
2012	29	2	14
2013	27	2	13
2014	31	4	16

Data on sulphur use have been collected since 1993 when only 3-6% of the cereal crop areas and 8% of the oilseed rape area received a sulphur application. By 2014, 47-57% of the area of cereals and 76% of oilseed rape received a dressing of sulphur. Overall applications of sulphur on tillage crops increased from 27 kg/ha in 2013 to 31 kg/ha in 2014 while applications on grass also increased in 2014 to 4 kg/ha (Table 3). This low overall rate on grass is a result of the low dressing cover, with only 11% of grass receiving a sulphur dressing.

## 6. Organic manures

Organic manures<sup>1</sup> applied to agricultural land may be produced on farm by livestock as slurries, farmyard manure (FYM) and poultry manures or imported from other sources such as treated sewage sludge (also called bio-solids) and some industrial 'wastes' such as compost, paper waste or brewery effluent. The nutrient levels in organic manures vary but provide a valuable source of nitrogen, phosphorus and potassium.

In 2014, around 66% of farms in the survey used organic manures on at least one field on the farm<sup>2</sup> (Table 4). Cattle manure from beef and dairy farms represents by far the largest volume of manure type generated in Great Britain. The proportion of farms using cattle FYM and cattle slurry has remained relatively stable over the last 5 years and was 52% and 16% of farms respectively in 2014.

Table 4: Numbers and percentage (%) of farms using each type of manure in Great Britain, 2014

	None	Cattle FYM	Cattle slurry	Pig FYM	Pig Slurry	Layer manure	Broiler/turkey litter	Other FYM	Other farm	Bio-solids	Other non-farm	Total
Farms in sample	432	733	228	32	15	34	36	48	12	39	26	991
Farms in population	32,228	48,683	14,651	1,846	789	1,442	1,342	3,734	782	1,503	1,315	61,209
Farms in population %	34%	52%	16%	2%	1%	2%	1%	4%	1%	2%	1%	66%
Volume (Mt: Mm <sup>3</sup> )	n/a	39.0	45.1	1.2	2.0	0.6	0.5	1.0	1.7	2.2	1.6	95.1
Volume %	n/a	41%	47%	1%	2%	1%	1%	1%	2%	2%	2%	100%

Note: some farmers may use more than one type of manure. Mt:Mm<sup>3</sup> are million tonnes and cubic metres.

In 2014, organic manure was applied to 22% of the area of tillage crops whereas this was 29% for grass five years and over and 49% for grass under five years old. The majority of cattle manure and slurry applications were made to grassland, reflecting the practice of utilising the manure on the farm on which it is produced.

Broadcast application is by far the predominant method of applying slurry. Fields for winter sown crop are primarily treated in August and September (prior to drilling) whereas spring sown and grass fields are predominantly treated between November and April.

Where organic manures are used, applications of manufactured fertiliser can usually be reduced. Whilst the survey did not specifically ask farmers whether they adjusted manufactured fertiliser inputs because of manure use, an indication of this is possible by comparing fields that received manure with those that did not. This shows that for the major tillage crops, cereals, oilseed rape and sugar beet, the overall application rate of nitrogen was lower on fields which received manure. A similar trend is also seen for phosphate and potash use.

<sup>1</sup> The underlying sample design of the BSFP is constructed to measure manufactured fertiliser usage and therefore may not represent the population of farmers using organic manures as robustly.

<sup>2</sup> Not all manure generated by a farm is necessarily retained for use by that farm and excess manure/slurry may be exported for use elsewhere.

## Further information

### Methodology

The BSFP is a voluntary annual survey of a sample of farmers selected from a population of agricultural holdings compiled using the June Agricultural Survey. The target sample size is around 1,500 farms; this sample size has been designed to achieve a statistically representative sample at the national level. Data collection is undertaken mainly through face to face interviews with individual farmers and in 2014 the response rate was 52%. The underlying sample design of the BSFP is constructed to measure manufactured fertiliser usage and therefore may not as reliably represent the population of farmers using organic manures. The standard errors are relatively small for tillage crops, all crops and the main arable crops of wheat, oilseed rape and barley. Detailed methodology is provided in the full Report.

All calculations of fertiliser rates are based on sown area of crops rather than field areas<sup>3</sup> and results are expressed in terms of the equivalent nutrient. The overall application rate takes into account the proportion of the crop area treated and the actual field rate of application used.

### Revisions

There are no data revisions to report for 2014.

### Glossary of key terms

Tillage: refers to all crops except grass, forestry, glasshouse crops and uncropped land.

Grass: refers to all forms of grassland which may be grazed, conserved or grown for seed production; rough grazing is excluded.

### Feedback

Feedback on the publication and the survey is welcome. Contact information for feedback or questions is provided on the front page of this statistical notice.

### Other surveys of interest

Defra also run other surveys which may be of relevance and interest to fertiliser use and related practices through its Farm Practices Survey for England which is available of the Defra [website](#).

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<sup>3</sup> This reflects cross-compliance and environmental scheme measures where field margins remain uncropped.