Fertiliser Statistics 2013

REPORT

The British Survey of Fertiliser Practice (BSFP), is the world's longest running most comprehensive survey of fertiliser practice, and the industry lobbies for its continuation.

This year, we were pleased to hear that its national value has been recognised and the BSFP has become a 'National Statistic'. This gives it a greater authority for the future and means decisions on food security, nutrient recovery, soil fertility and environmental protection will continue to be well-informed.

If we combine the BSFP farm nutrient usage rates, with information on fertiliser nutrients delivered to farm, which we do every year, we have a very robust picture of actual farm practice and nutrient consumption at the UK level. These, figures in turn contribute to European and International data collection services.

Wherever possible, we offer further insight into trends over-time to describe how agricultural practices and nutrient use are evolving. Government statistics on quantities of manures produced and spread on land, plus data collated for soil analyses by UK laboratories give a useful indication of soil phosphate and potassium distribution as well as the efficiency of nutrient recycling from organic manures.

Collectively, these data give AIC Members hard evidence to develop sustainable food production systems to ask policy-makers to help bring them into reality.

Table 1: Areas of main crops and managed grass in the UK ('000 ha)

Growing season:	2007/08 5-yrs ago	2008/09	2009/10	2010/11	**2011/12**	1 year % change 2011-12	5 year % change 2008-12	crop area as % of total 2011/12
Wheat	2080	1775	1939	1969	**1992**	+ 1.2	- 4.2	16.7
Barley	1032	1143	921	970	**1002**	+ 3.3	- 2.9	8.4
Total cereals	3274	3076	3013	3075	**3142**	+ 2.2	- 4.0	26.4
Potatoes	144	144	138	146	**149**	+ 2.1	+ 3.5	1.3
Sugar beet	120	114	118	113	**120**	+ 6.2	0.0	1.0
Oilseeds (inc. linseed)	621	600	686	742	**785**	+ 5.8	+ 26.4	6.6
Peas/beans (dry)	148	228	210	155	**120**	- 22.6	- 18.9	1.0
Other crops (excl. grass)	428	445	445	443	**432**	- 2.5	+ 0.9	3.6
Grass, < 5 yrs old	1141	1241	1232	1278	**1357**	+ 6.2	+ 18.9	11.4
Grass, 5 yrs old+	6036	5865	5925	5877	**5799**	- 1.3	- 3.9	48.7
Total UK area*	**11912**	**11713**	**11767**	**11829**	**11904**	**+ 0.6**	**- 0.1**	**100.0**
Uncropped arable land	194	244	174	156	**153**	- 1.9	- 21.1	

* Area of potentially fertilised arable land and managed grass.

Source: Defra Statistics

Figure 1: Changes in overall fertiliser nutrient application rates, England and Wales

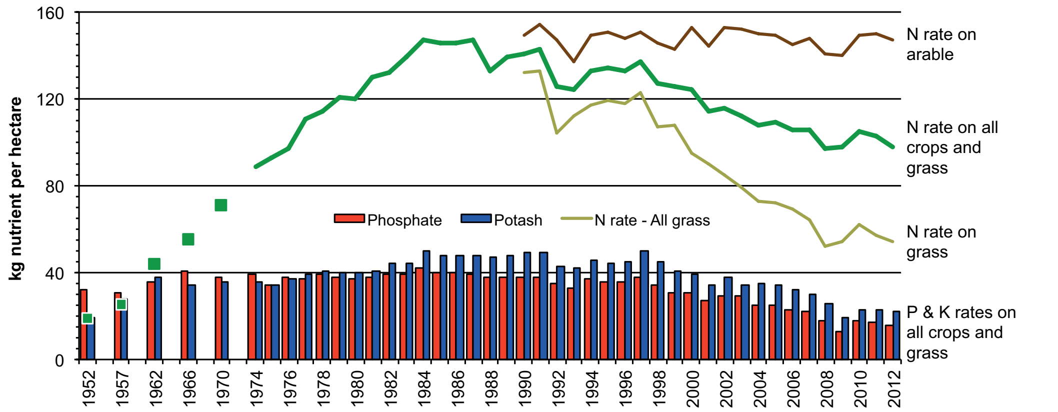


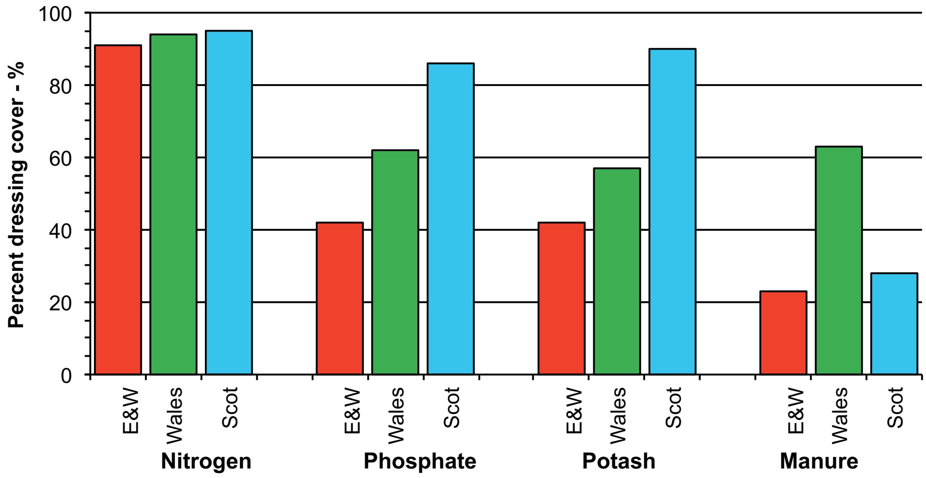
Figure 1 shows the overall application rates of nutrients to all crops and grass in England and Wales, for which a long-term dataset exists. This figure shows application rates per hectare and illustrates the decline in overall rates of nitrogen (N), phosphate (P_2O_5) and potash (K_2O) since the early 1990s; whereas Table 3 shows the overall consumption in tonnes of nutrients, but for the United Kingdom. While the rate of use of P_2O_5 and K_2O has declined on much arable land – notably combinable cereals, oilseeds and pulses – as well as on grassland, the same is not true for nitrogen. Almost all the decline in rate of use of N has been on grassland, but as the figure illustrates, the N rate on arable crops has been maintained. The decline in application rates of phosphate and potash on arable crops is much less severe in Scotland than in England (Figure 2).

The application rates, particularly for P_2O_5 and K_2O, declined significantly in 2008 as a result of the spike in fertiliser prices. The apparent dip in N application rates recovered fully by 2010 in the arable sector, returning to trend on grassland.

Source: British Survey of Fertiliser Pra

Figure 2: Percent of all arable land receiving dressings of fertiliser nutrients and manure by GB area in 2012

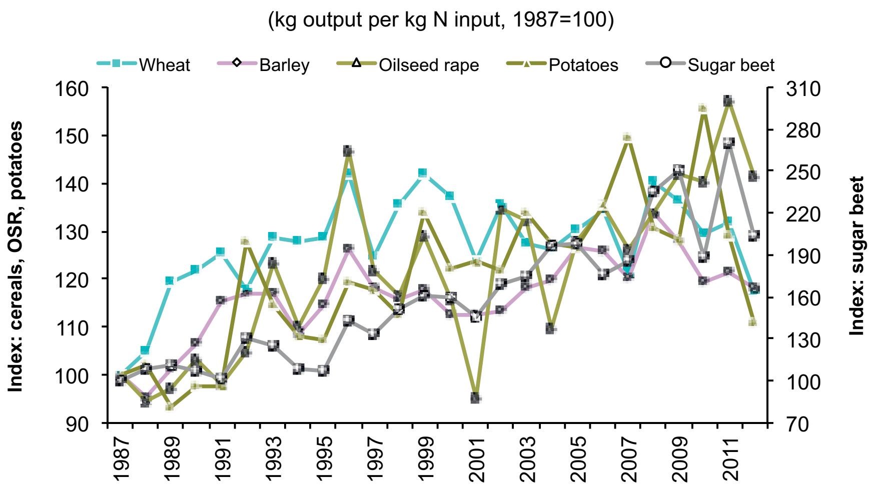
The British Survey of Fertiliser Practice records not just the application rates of fertiliser nutrients where applied, but also the total area of each crop which actually receives a dressing. Figure 2 illustrates the percentage of this dressing cover for all arable cropped land for the three nutrients nitrogen, phosphate and potash and also for all organic manures (farm and-non farm in origin). The results are presented by GB country area and show a national uniformity in the dressing cover of nitrogen but very significant differences in regional fertiliser practice for phosphate and potash. These differences in dressing cover for phosphate and potash have been apparent for several years, with less than half the arable area in England receiving a dressing compared with over 80% in Scotland.



Source: British Survey of Fertiliser Pract

Figure 3: Changes in the apparent efficiency in the use of fertiliser nitrogen, England & Wales.

This chart illustrates the apparent relative efficiency with which a number of arable crops are calculated to use the nitrogen fertiliser applied, as kg output per kg mineral nitrogen input, with 1987 representing an index of 100. There is a generally improving performance, although the effect of relatively low yields from the 2012 harvest is apparent. The concept of nitrogen use efficiency is complex, but the chart shows a continuing average improvement in production per unit of nitrogen input for all crops over the period.



Sources: British Survey of Fertiliser Practice and Defra

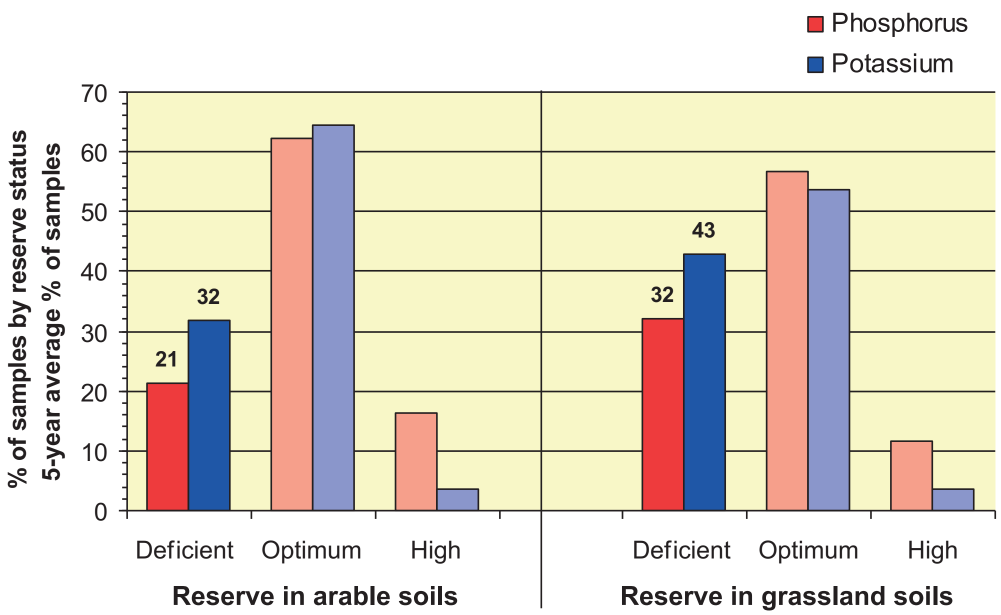
Table 2: Overall rates of fertiliser usage, Great Britain

			kg/ha				
			2007/08	**2008/09**	**2009/10**	**2010/11**	**2011/12**
Arable	**Total Nitrogen**		**137**	**137**	**145**	**146**	**144**
	Compound N	N	15	14	14	14	13
	Straight N		122	123	131	132	131
	Total Phosphate	P_2O_5	**30**	**23**	**30**	**29**	**28**
	Total Potash	K_2O	**43**	**33**	**38**	**39**	**37**
Grass	**Total Nitrogen**		**55**	**57**	**63**	**57**	**56**
	Compound N	N	32	29	33	29	31
	Straight N		23	28	30	28	25
	Total Phosphate	P_2O_5	**10**	**9**	**10**	**9**	**9**
	Total Potash	K_2O	**13**	**12**	**14**	**12**	**12**
Arable & Grass	**Total Nitrogen**		**94**	**95**	**101**	**99**	**95**
	Compound N	N	24	22	24	22	23
	Straight N		70	74	77	77	72
	Total Phosphate	P_2O_5	**20**	**15**	**19**	**19**	**17**
	Total Potash	K_2O	**27**	**22**	**25**	**25**	**23**

Source: British Survey of Fertiliser Pra

Figure 4: Classification of the phosphorus and potassium status of arable and grassland soils in the UK

Laboratories analysing samples from agricultural soils in the UK formed the Professional Agricultural Analysis Group (PAAG), which now provides an annual overview of confidentially amalgamated results for soil phosphorus (P) and potassium (K) analysis, as well as for magnesium and pH. Over the past five seasons an average of over 185,000 soil samples have been analysed each year and the overall results are illustrated in Figure 4. On average 21% of the P samples and 32% of the K samples from arable soils have a deficient nutrient reserve status, with 32% of the P samples and 43% of the K samples from grassland soils being deficient. Crops and grass grown on these soils are unlikely to perform to their full potential, with both yield and quality potentially being compromised.



Source: PAAG analysis reports.

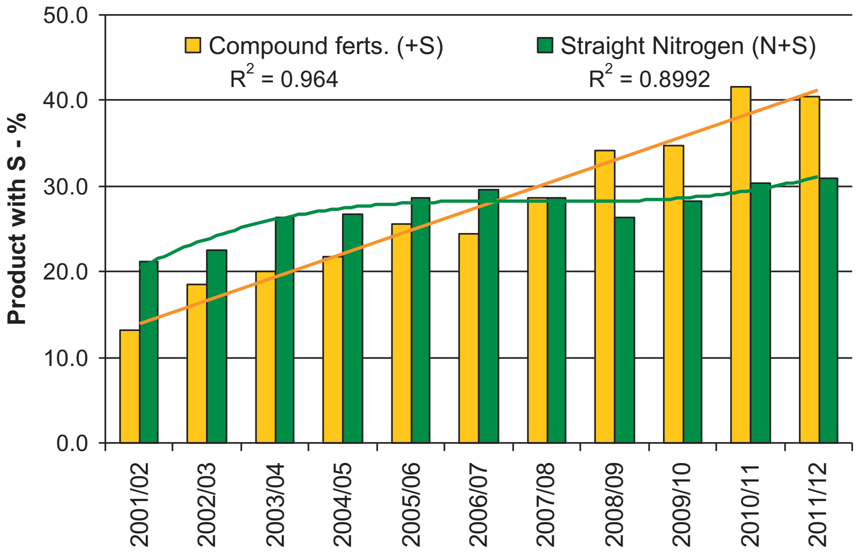
Table 3: UK consumption of fertiliser nutrients ('000 tonnes)

Growing season:	2001/02 10 yrs ago	2007/08	2008/09	2009/10	**2010/11**	**2011/12**	1 year % change 2011-12	10 year % change 2002-12
Nitrogen (N)	1197	1001	948	1016	**1022**	**1000**	- 2.2	- 16.5
Phosphate (P_2O_5)	283	215	129	184	**192**	**188**	- 2.1	- 33.6
Potash (K_2O)	391	325	208	251	**283**	**259**	- 8.5	- 33.8
Total Plant Food	1871	1541	1285	1451	**1497**	**1447**	- 3.3	- 22.7

Source: AIC Statistics

Figure 5: Inclusion of sulphur in compound and nitrogen fertilisers in UK

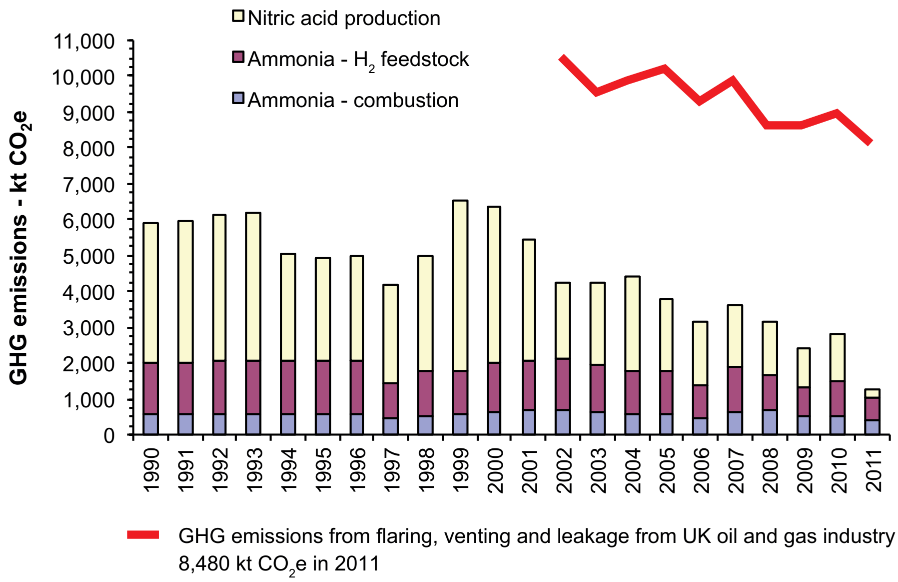
AIC Members have been recording data on sulphur-containing fertilisers for many years. Figure 5 shows the UK trend in the use of both compound fertilisers with sulphur (S), and straight N products with S. Considering the now negligible input of S to land from the atmosphere, the Figure shows that the proportion of fertilisers containing sulphur is still surprisingly low. Moreover, while the 11-year trend for S inclusion in compound fertilisers continues to rise, for straight nitrogen the use of NS products has shown less growth over the past five years. Sulphur is required as a constituent of proteins and plays an essential role in balanced nutrition of both plants and animals. The British Survey of Fertiliser Practice (BSFP) has provided information on S use over many years, and now includes estimates of dressing cover for all major crops. The 2012 edition calculates that 47% of all tillage crops in Great Britain receive S, but that only 7% of grass receives this nutrient, despite it being an essential constituent of ruminant diets.



Source: AIC Statistics and BSFP

Figure 6: Greenhouse gas emissions from nitrogen fertiliser production in the UK

Emissions of greenhouse gases (carbon dioxide [CO_2], methane [CH_4] and nitrous oxide [N_2O]) during fertiliser production have decreased almost 5-fold since 1990 in the UK. The chart shows the emissions by function in this production, which is largely as ammonium nitrate. In 2011 about 50% of the emissions as CO_2 equivalents (CO_2e) were as carbon dioxide from the methane used to provide half the hydrogen (H_2) required in ammonia synthesis (the other half being provided by steam). A large proportion of this process CO_2 is in fact liquefied and sold to other industries – for example for carbonation of sparkling bottled water – and is not directly vented from the fertiliser plant. About a third of emissions, also as CO_2, are from burning natural gas to provide heat for the process. The remaining 16% of CO_2e is from nitrous oxide generated during nitric acid production. This proportion has shown the greatest reduction, down from almost two thirds of the total CO_2e produced in 1990, due to the installation of new catalytic abatement technology to nitric acid plants.



Source: National Atmospheric Emissions Inventory

Considering the perception that fertiliser nitrogen production is a relatively major source of greenhouse gases (GHG), it is noteworthy that flaring at UK oil wells and the venting and leakage of natural gas during production and distribution accounts for almost seven times more GHG emission than UK fertiliser production.

Agricultural Industries Confederation
Confederation House
East of England Showground
Peterborough PE2 6XE
T: 01733 385230 F: 01733 385270
E: enquiries@agindustries.org.uk
www.agindustries.org.uk

This summary uses Government data on land use, statistics and The British Survey of Fertiliser Practice (BSFP). The Survey, funded jointly by Defra and the Scottish Government, is an independent annual report of fertiliser application rates providing data for farmers and environmentalists, regulators and the industry. It also provides information on lime use and organic manure application.

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