aic agricultural industries confederation ®

Fertiliser Statistics 2014

REPORT

Fertiliser use is influenced by two main factors: the areas of different crops grown and their nutrient requirements, and professional decision-making. The expertise behind fertiliser planning and recommendations falls either in the hands of the farmer, his FACTS Qualified Adviser or ideally both, resulting in their combined experience being applied. In the past four years there has been significant new investment to raise the skills and knowledge of FACTS Qualified Advisers to ensure they are well equipped to advise on emerging priorities for Nutrient Management Planning. It is estimated that the investment in Continuing Professional Development, in both crop nutrition and crop protection is now in the region of £5 million a year and that around 20,000 farm visits are made by industry advisers every week.

AIC believes that the collective effort in CPD activities is the main route to achieving the broader obligations that agriculture now has for food security, water and air quality targets, as well as greenhouse gas reduction. Many of these goals depend on how efficiently nutrient resources can be used. There are huge challenges ahead which is why the fertiliser sector is so keen to see the positive changes measured and opportunities for improvements found. The data within this report are essential for this purpose.

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

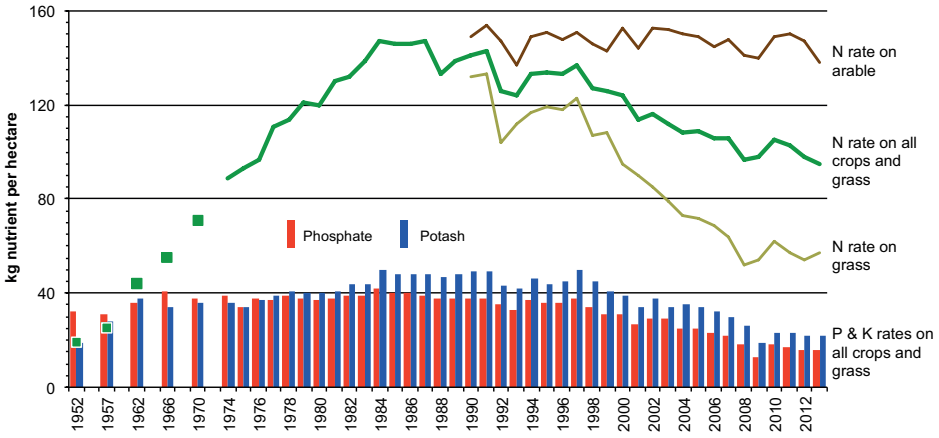
Growing season:	2008/09 5-yrs ago	2009/10	2010/11	**2011/12**	**2012/13**	1 year % change 2012-13	5 year % change 2009-13	crop area as % of total 2012/13
Wheat	1775	1939	1969	**1992**	**1615**	- 18.9	- 9.0	13.6
Barley	1143	921	970	**1002**	**1213**	+ 21.1	+ 6.1	10.2
Total cereals	3076	3013	3075	**3142**	**3028**	- 3.6	- 1.6	25.5
Potatoes	144	138	146	**149**	**139**	- 6.7	- 3.5	1.2
Sugar beet	114	118	113	**120**	**117**	- 2.5	+ 2.6	1.0
Oilseeds (inc. linseed)	600	686	742	**785**	**750**	- 4.8	+ 25.0	6.3
Peas/beans (dry)	228	210	155	**120**	**147**	+ 22.5	- 35.5	1.2
Other crops (excl. grass)	445	445	443	**432**	**484**	+ 12.0	+ 8.8	4.1
Grass, < 5 yrs old	1241	1232	1278	**1357**	**1390**	+ 2.4	+ 12.0	11.7
Grass, 5 yrs old+	5865	5925	5877	**5799**	**5802**	+ 0.1	- 1.1	48.9
Total UK area*	**11713**	**11767**	**11829**	**11904**	**11857**	**- 0.4**	**+ 1.2**	**100.0**
Uncropped arable land	244	174	156	**153**	**255**	+ 66.7	+ 4.5	

* 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 the application rates per hectare and illustrates the decline in the overall application 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 for all of 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.

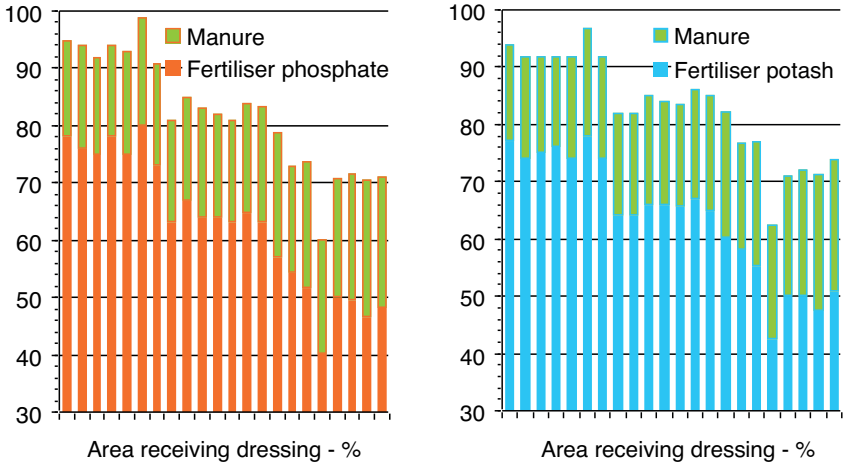


Source: British Survey of Fertiliser Practice

Phosphate and potash application rates have declined since the peak use in the 1990s. On grassland, rates of use have declined in line with reduced fertiliser nitrogen use; while on arable land, application rates have also declined significantly, despite the nitrogen application rate being maintained. Recent data on the rates of use of phosphate and potash suggest that the decline in use may now have 'bottomed out'.

Figure 2: Percent of all arable land receiving phosphate, potash and manure in GB

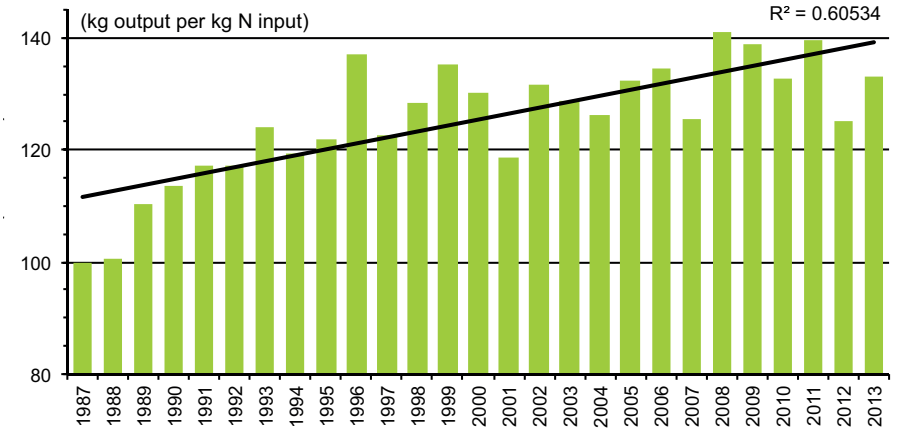
The British Survey of Fertiliser Practice shows that the decline in overall application rates of phosphate and potash on arable land in Britain has largely been due to an increase in the area not receiving any dressing of these nutrients. Over the past four seasons approximately 50% of the area has been dressed, with about 20% receiving a dressing of organic manure (not necessarily farm manure). Even if it is assumed that all the manure is applied to land which does not receive a fertiliser dressing, still only 70% of the arable land receives an application of phosphate or potash, despite 92% receiving mineral nitrogen.



Source: British Survey of Fertiliser Practice

Figure 3: Trend in apparent efficiency of fertiliser nitrogen use on the major arable crops in England & Wales

Despite the potential shortfall in phosphate and potash applications illustrated in Figure 2, some improvement in the apparent efficiency of use of fertiliser nitrogen is suggested by Figure 3. However, yields of cereals and oilseeds have risen little in recent seasons (it is on these crops that the lack of phosphate and potash input is most significant), and the application of nitrogen fertiliser has declined only slightly on arable crops, as indicated in Figure 1. Root crops, particularly sugar beet, on which full nutrient applications – including manures – have been maintained are the major drivers of the trend seen in Figure 3.



Source: British Survey of Fertiliser Practice

Table 2: Overall rates of fertiliser usage, Great Britain

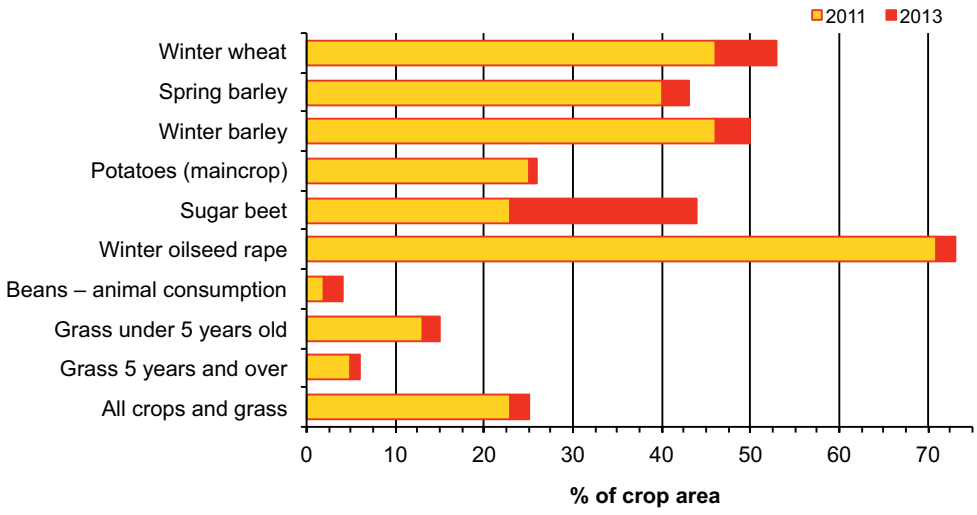
kg/ha

			2008/09	2009/10	2010/11	2011/12	2012/13
Arable	**Total Nitrogen**		**137**	**145**	**146**	**144**	**137**
	Compound N	N	14	14	14	13	16
	Straight N		123	131	132	131	121
	Total Phosphate	P_2O_5	**23**	**30**	**29**	**28**	**28**
	Total Potash	K_2O	**33**	**38**	**39**	**37**	**40**
Grass	**Total Nitrogen**		**57**	**63**	**57**	**56**	**59**
	Compound N	N	29	33	29	31	31
	Straight N		28	30	28	25	28
	Total Phosphate	P_2O_5	**9**	**10**	**9**	**9**	**9**
	Total Potash	K_2O	**12**	**14**	**12**	**12**	**13**
Arable & Grass	**Total Nitrogen**		**95**	**101**	**99**	**95**	**94**
	Compound N	N	22	24	22	23	24
	Straight N		74	77	77	72	70
	Total Phosphate	P_2O_5	**15**	**19**	**19**	**17**	**18**
	Total Potash	K_2O	**22**	**25**	**25**	**23**	**25**

Source: British Survey of Fertiliser Practice

Figure 4: Percent of crop areas in GB receiving a fertiliser sulphur dressing, 2011 and 2013

Atmospheric sulphur deposition is now so low in the UK that it can be virtually discounted as a useful source for agriculture. However, the British Survey of Fertiliser Practice still indicates that only 70% of the oilseed rape crop (a brassica with high sulphur requirement) has a sulphur fertiliser dressing. No other crop has over half the area dressed. Considering that sulphur is, like nitrogen, an essential protein constituent, and that 92% of arable and 62% of grassland receives fertiliser nitrogen, largely for protein synthesis, it is clearly potentially restricting that on average only 47% of tillage and 8% of grassland receives fertiliser sulphur. Figure 4 shows an increasing use of sulphur over the past three years, but only the sugar beet crop, and to an extent wheat, show the progress which minimal atmospheric deposition might suggest is necessary.



Source: Source: British Survey of Fertiliser Practice

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

Growing season:	2002/03 10 yrs ago	2008/09	2009/10	2010/11	**2011/12**	**2012/13**	1 year % change 2012-13	10 year % change 2003-13
Nitrogen (N)	1131	948	1016	1022	**1000**	**998**	- 0.2	- 11.8
Phosphate (P_2O_5)	282	129	184	192	**188**	**194**	+ 3.2	- 31.2
Potash (K_2O)	375	208	251	283	**259**	**267**	+ 3.1	- 28.8
Total Plant Food	1788	1285	1451	1497	**1447**	**1459**	+ 0.8	- 18.4

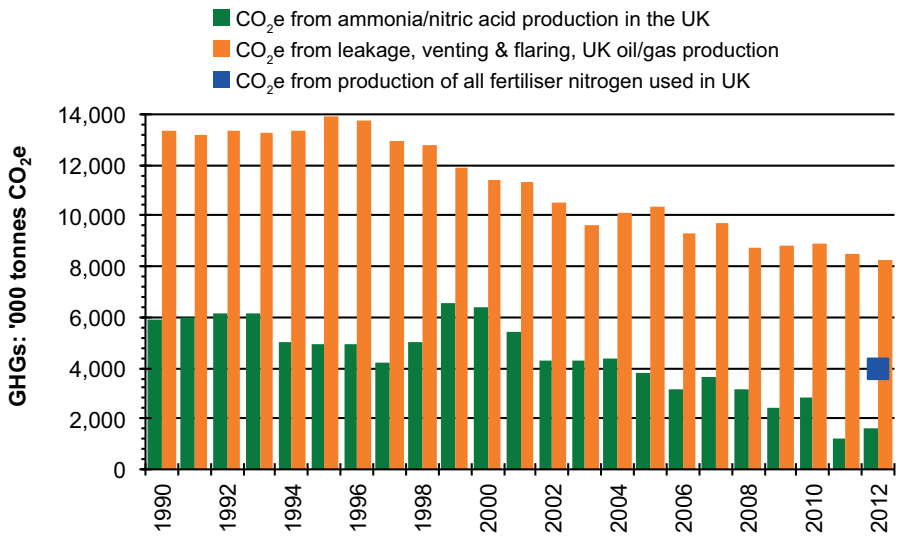
Source: AIC Statistics

Figure 5: GHG emitted during production of UK nitrogen fertilisers and losses from UK oil/gas industry

The conversion of atmospheric nitrogen into fertiliser forms available to crops is essential to augment biological fixation and N-recycling to produce sufficient food for today's global population. However, it involves using energy sources, in part for process heat, but particularly to provide the hydrogen for combination with nitrogen to form ammonia (NH_3), the basis of nitrogen fertilisers. In the context of most other agricultural inputs, nitrogen fertiliser has a high greenhouse gas (GHG) profile due to this energy consumption, but it is important to keep this in perspective. Globally only about 1% of total energy use is for nitrogen fertiliser production.

Figure 5 shows the recent reduction in GHG emissions measured as carbon dioxide equivalents (CO_2e) from this N production in the UK, and also the calculated total GHGs from production of all the nitrogen fertiliser used in the UK in 2012, including imported material.

These emissions are compared in Figure 5 with GHGs emitted as losses, principally as natural gas (methane), through pipeline leakage, venting to air and through flaring (burning) at well-heads, etc. It can be seen that the total GHGs emitted in the production of all the nitrogen fertiliser used in the UK is only about half of that emitted as a loss from the UK oil and gas sector.

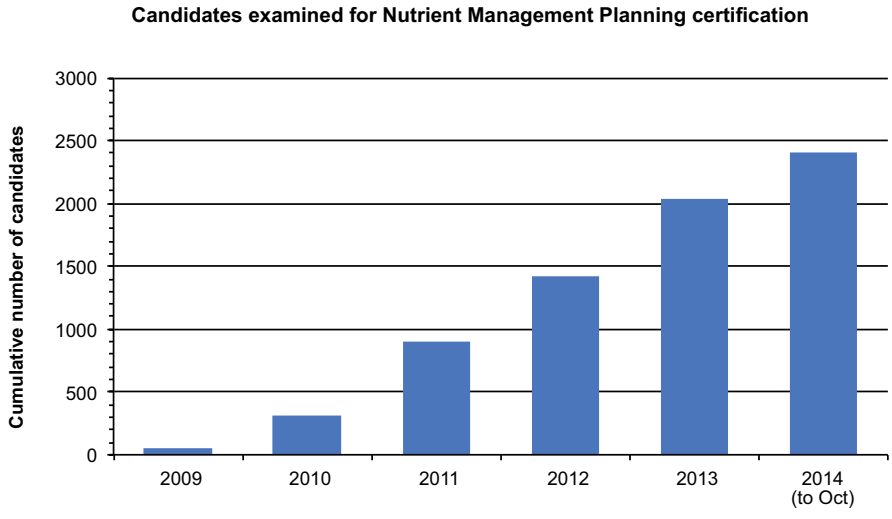


Sources: UK National Atmospheric Emissions Inventory, AIC and Fertilizers Europe Statistics

Figure 6: Total FACTS Qualified Advisers (FQAs) who have taken Nutrient Management Planning courses

Figure 6 illustrates the progress being made towards a new level of continuing professional development (CPD) proficiency for FACTS advisers. The unique UK FACTS scheme was introduced in 1993 by the industry as a voluntary certification of competence in good practice advice on farm in plant nutrition and environmental management. Most of those providing practical crop nutrition advice are now certificated as FACTS Qualified Advisers (FQAs). Since 2009, the scheme has further enhanced its CPD programme by introducing an additional Nutrient Management Planning (NMP) training module. This course, with its on-line assessment, aims to ensure that FQAs are fully up to date with the latest regulations and advice to help farmers optimise their economic and environmental decision-making when using fertilisers and manures.

There are approximately 3,600 FACTS advisers at this time, including about 1,000 who are newly-qualified, having passed the initial FACTS exam within the past five years. These recently qualified advisers are required to complete the NMP course within five years of their initial qualification. About 2,500 of the existing FQAs have successfully completed the NMP course.



Source: BASIS Registration Ltd.

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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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