Fertiliser Statistics2011

REPORT

While much of this document, as always focuses on individual fertiliser ingredients – nitrogen (N), phosphate (P_2O_5), potash (K_2O) and sulphur SO_3. There is a need to take a holistic view of what this report tells us.

As long ago as the 1840s, the law of the minimum was understood, where potential growth is limited by the nutrient in shortest supply. The famous barrel illustrates how yield can only rise to the potential of the most limiting factor.

We face the challenge of 'sustainable intensification'. This requires the farming industry to optimise output to feed a growing world, whilst safeguarding the environment in which it operates. Such optimisation can only be achieved by ensuring crops and grassland have an adequate balance of all nutrients. For example, nitrogen use efficiency cannot be achieved without due attention to the nutrients that underpin it. This report highlights, once again unsustainable long-term trends in the balance of nutrients across Britain's farmland. Unless the balance is redressed, the industry will fail to achieve what national policy requires.

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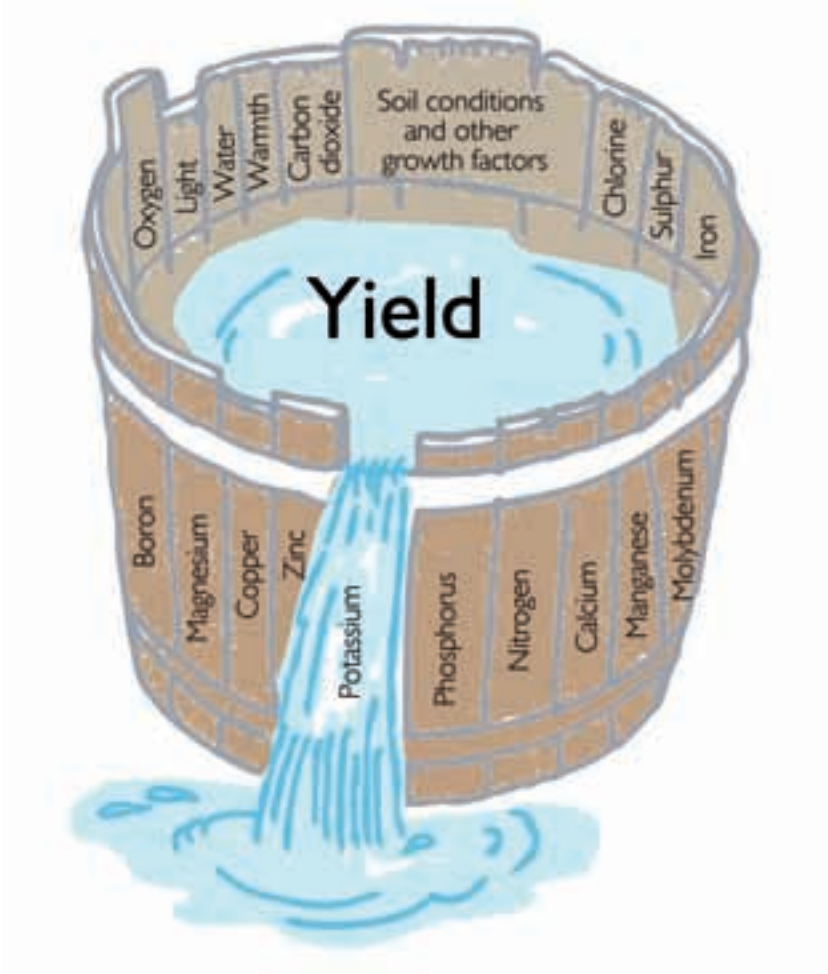


Table 1: Areas of main crops and managed grass in the UK ('000 ha)

Growing season:	2005/06 5-yrs ago	2006/07	2007/08	2008/09	**2009/10**	1 year % change 2009-10	5 year % change 2006-10	crop area as % of total 2009/10
Wheat	1836	1830	2080	1775	**1939**	+ 9.2	+ 5.6	16.5
Barley	881	898	1032	1143	**921**	- 19.4	+ 4.5	7.8
Total cereals	2864	2885	3274	3076	**3013**	- 2.0	+ 5.2	25.6
Potatoes	140	140	144	144	**138**	- 4.2	- 1.4	1.2
Sugar beet	130	125	120	114	**118**	+ 3.5	- 9.2	1.0
Oilseeds (inc. linseed)	605	687	621	600	**686**	+ 14.3	+ 13.4	5.8
Peas/beans (dry)	231	161	148	228	**210**	- 7.9	- 9.1	1.8
Other crops (excl. grass)	428	442	428	445	**445**	+ 0.0	+ 4.0	3.8
Grass, < 5 yrs old	1137	1176	1141	1241	**1232**	- 0.7	+ 8.4	10.5
Grass, 5 yrs old+	5967	5965	6036	5865	**5925**	+ 1.0	- 0.7	50.4
Total UK area*	**11502**	**11581**	**11912**	**11713**	**11767**	**+ 0.5**	**+ 2.3**	**100.0**
Uncropped arable land	663	599	194	244	**174**	- 28.7	- 73.8	

** Area of potentially fertilised arable land and managed grass.*

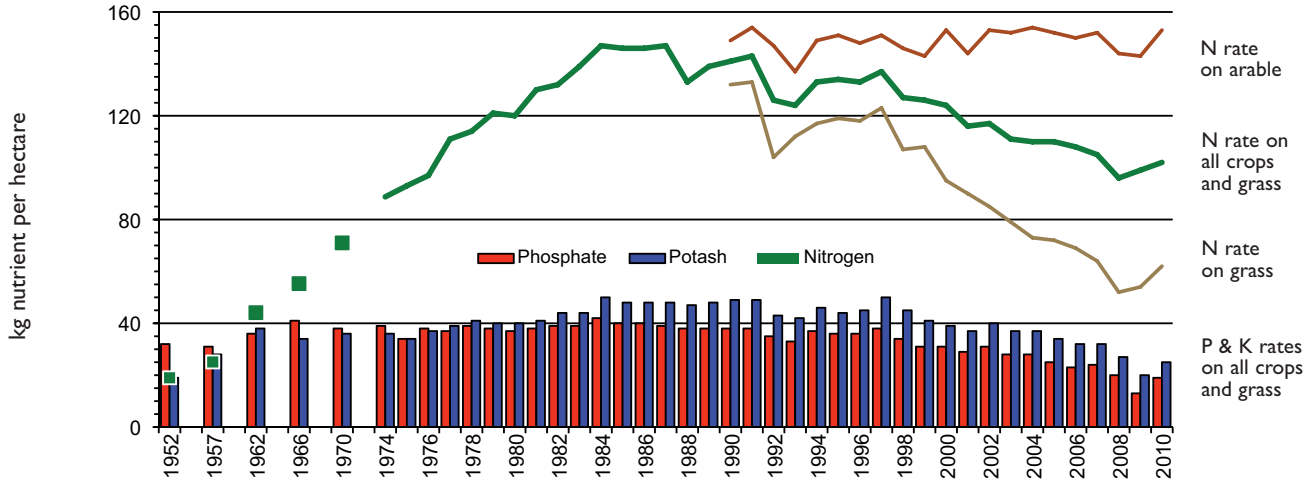
Source: Defra Statistics

Some charts in this report illustrate data for England & Wales because these are the longest-running data sets in the UK. Amalgamated GB data are only available in detail since 1992.

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. The chart shows rates of application per hectare whereas Table 3 shows the overall consumption in tonnes of nutrients, but for the UK. Figure 1 illustrates the decline in the overall rates of nitrogen (N), phosphate (P_2O_5) and potash (K_2O) which has taken place since the early 1990s. While the rate of use of P_2O_5 and K_2O has declined on much arable land – notably cereals, oilseeds and pulses – as well as on grassland, the same is not the case for nitrogen. Almost all the decline in rate of N use has been on grassland matching the reductions in rates of P_2O_5 and K_2O, while the N rate on arable crops has been maintained.

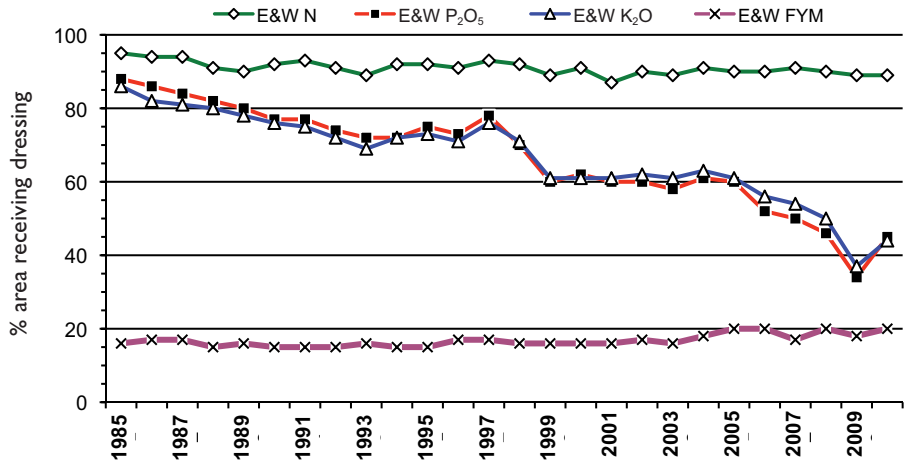
The application rates, particularly for P_2O_5 and K_2O, fell significantly as a result of the spike in prices, although much of that reduction had recovered by 2010. The apparent dip in N application rates recovered fully by 2010 in the arable sector, and returned to trend on grassland.



Source: British Survey of Fertiliser Practice

Figure 2: Percentage of cropped arable areas receiving manufactured fertiliser nutrients and manures in England and Wales and in Scotland

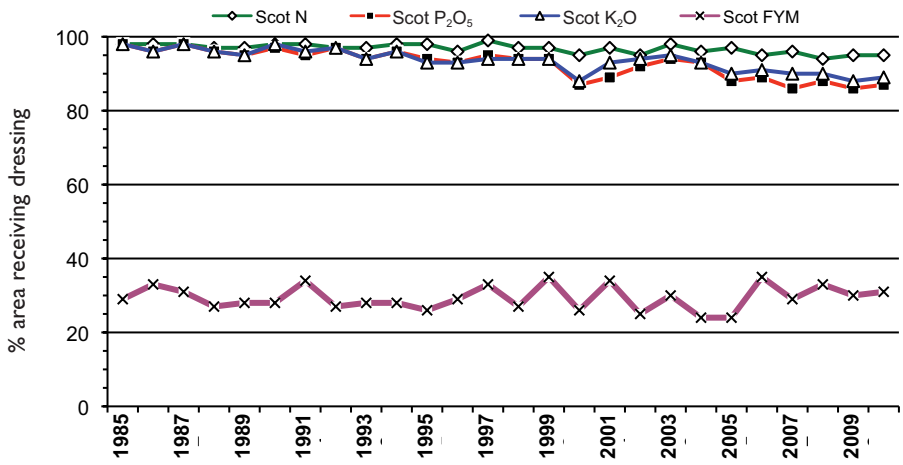
Figure 2a % of arable are receiving nutrients and manure in England and Wales



The decline in overall application rates for phosphate and potash in England and Wales since the 1990s, was primarily due to a reduction in the area receiving P_2O_5 and K_2O rather than a reduced rate of application. This is illustrated in Figure 2a, which also shows a relatively constant dressing cover for both N and manures (FYM in the chart includes slurries and other organic manure). It is clear that this trend in P_2O_5 and K_2O use in relation to the maintained N application rate, is not sustainable, and creates an increasing level of risk of nutrient deficiency despite some input from manures and other organic sources.

In Scotland the pattern is surprisingly different, with dressing covers for P_2O_5 and K_2O on arable land declining very little over the same period, (Figure 2b). The reason for this difference is not known, but it may be due to the historical close relationship between those providing agricultural education and those giving practical advice on farm, or to a different assessment of risk by Scottish farmers.

Figure 2b % of arable are receiving nutrients and manure in Scotland



Source: British Survey of Fertiliser Practice

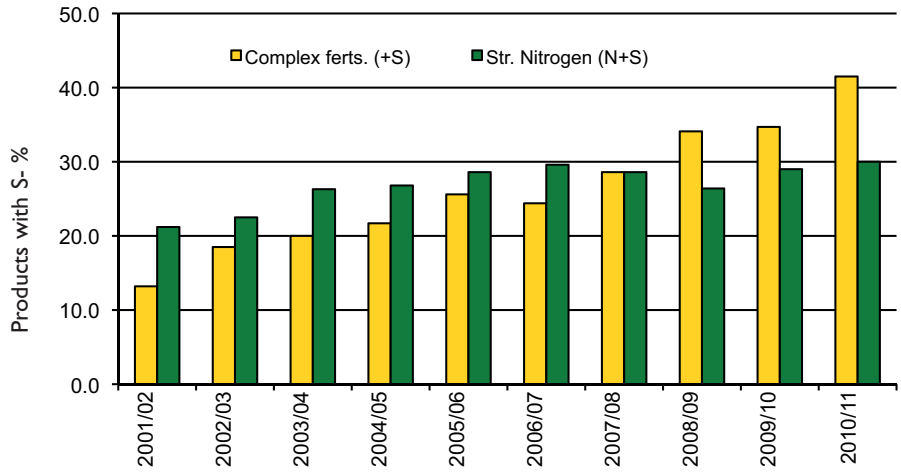
Table 2: Overall rates of fertiliser usage, Great Britain

			kg/ha				
			2005/06	2006/07	2007/08	2008/09	2009/10
Arable	**Total Nitrogen**		**147**	**148**	**144**	**139**	**149**
	Compound N	N	18	15	16	14	14
	Straight N		130	129	133	128	135
	Total Phosphate	P_2O_5	**35**	**34**	**31**	**23**	**30**
	Total Potash	K_2O	**49**	**47**	**43**	**33**	**38**
Grass	**Total Nitrogen**		**74**	**72**	**65**	**55**	**63**
	Compound N	N	44	39	32	29	33
	Straight N		28	26	23	28	30
	Total Phosphate	P_2O_5	**16**	**14**	**10**	**9**	**10**
	Total Potash	K_2O	**21**	**18**	**13**	**12**	**14**
Arable & Grass	**Total Nitrogen**		**107**	**105**	**96**	**97**	**102**
	Compound N	N	33	28	24	22	24
	Straight N		74	77	72	75	78
	Total Phosphate	P_2O_5	**25**	**24**	**20**	**15**	**19**
	Total Potash	K_2O	**34**	**32**	**27**	**22**	**25**

Source: British Survey of Fertiliser Practice

Figure 3: Estimates of the proportion of fertiliser products containing sulphur in the UK market

AIC Members have recorded data on sulphur-containing fertilisers for many years, and Figure 3 shows the UK trend in compound/complex fertilisers with sulphur (S), and straight N products with S. Considering the now negligible inputs of sulphur to land from the atmosphere, the proportion of fertilisers containing sulphur is still surprisingly low. Moreover, while the 10 year trend for S inclusion in compound/complex fertilisers continues to rise, for straight nitrogen the use of NS products has effectively not increased 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 the use of S for many years, but the 2010 Report includes estimates of dressing cover for all major crops. This edition estimates that 40% of all tillage crops in Great Britain receive S, but that only 6% of grass receives this nutrient, an essential constituent of ruminant diets.



Source: AIC Statistics

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

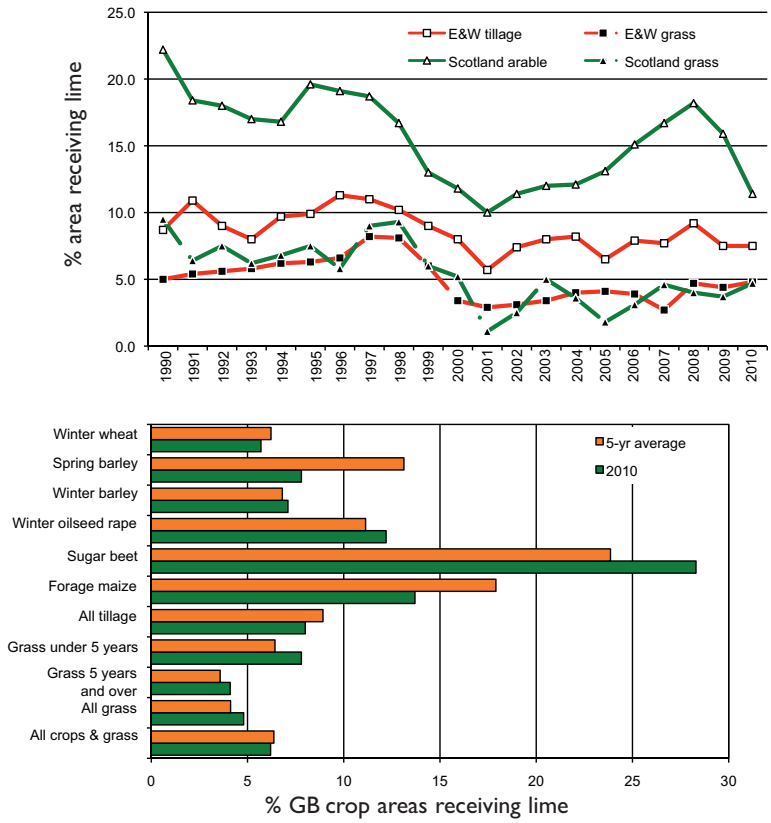
Growing season:	1999/00 10 yrs ago	2005/06	2006/07	2007/08	2008/09	**2009/10**	1 year % change 2008-09	10 year % change 1999-09
Nitrogen (N)	1268	1003	1008	1006	913	**1016**	+ 11.3	- 19.9
Phosphate (P_2O_5)	317	235	224	215	129	**184**	+ 42.6	- 42.0
Potash (K_2O)	409	325	317	325	208	**251**	+ 20.7	- 38.6
Total Plant Food	1994	1563	1549	1546	1250	**1451**	+ 16.1	- 27.2

Source: AIC Statistics

Figure 4: Percentages of arable and grassland in England and Wales and in Scotland, and of specific GB crop areas receiving applications of lime

Having noted that the use of P_2O_5 and K_2O has declined in England and Wales since the mid 1990s, a similar picture is apparent from the BSFP estimates of dressings of lime, with the use in Scotland also having declined. However it can be seen that the reduction was more a step change than a trend, with current dressing covers being maintained except for apparent fluctuations in Scottish arable land (which may in part be due to a relatively small sample, subject to greater error). The reduction in fertiliser N use on grassland could have reduced the need for lime, although improved N use efficiency from manures could require some increase.

The PAAG Soil Analysis Survey for 2009/10 indicates that 13% of UK arable soil samples had a low pH of less than 6.0 (with 31% below pH 6.5), and that 21% of grassland samples were below pH 5.5 (60% below pH 6.0).



Source: British Survey of Fertiliser Practice

Figure 5: Trends in some relative UK input and output prices

Both agricultural inputs (Figure 5a) and outputs (Figure 5b) have seen significant price movements over recent seasons; both are subject to fluctuating global markets.

The two charts show price changes relative to 2005 prices being based as 100. Nitrogen fertiliser, fuel oil and animal feedingstuffs have doubled since then, as has the price of straw, while cereals have has increased over 2½ times and oilseed rape three-fold. These fluctuating global prices present challenges to UK farmers and their suppliers.

Figure 5a

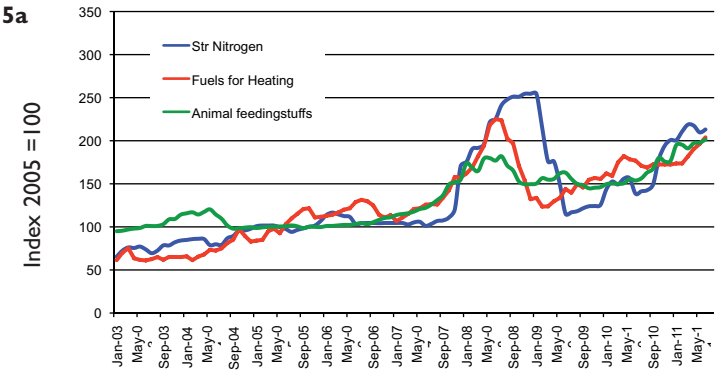
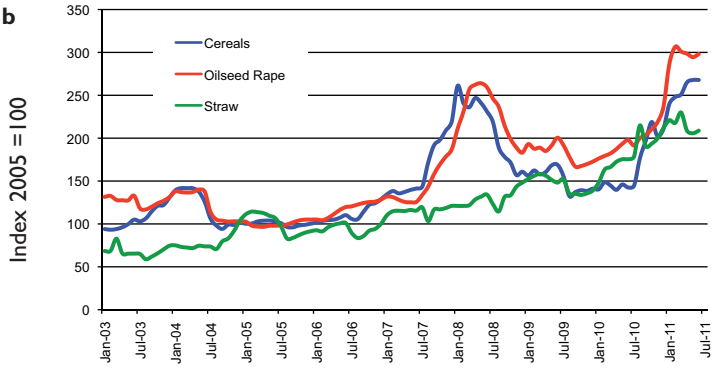


Figure 5b



Source: Defra statistics

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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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