PAAG
Professional Agricultural Analysis Group

Collation of Data from Routine UK Soil Analysis

2008/2009

Professional Agricultural Analysis Group

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Contents

Summary

Results are reported for statistical collation of soil analytical data provided by participants in the Professional Agricultural Analysis Group. For the current year (June 1st 2008 to May 31st 2009) results for 112,000-129,000 samples were available (different numbers for pH, P, K and Mg).

Some participants provided data that could be broken down by arable and grass as the current crop or by geographical region. Various datasets were constructed to allow collation within these breakdowns.

Conclusions should be drawn cautiously as the data were not necessarily representative of all UK fields and data collations were not statistically rigorous.

In the current year, only 29% of samples were at target Indices of 2 for P and 2- for K. 27% of samples were below target Index for P and 38% were below target Index for K. This was clear support for the need to base fertilizer use on regular soil analysis.

In the current year, 16% of samples were in Mg Indices 0 or 1 where application of magnesium might be recommended for some crops.

There were statistically significant but weak correlations between pH and Olsen P (negative) and between ammonium nitrate extractable K and Mg (positive).

There were some differences between arable and grass and between the ten geographical regions used in the collation. Soil pH was generally higher and Mg Index lower for arable than for grass samples. Percentage of samples in P Indices 0 or 1 varied from 5% (arable) and 13% (grass) in Scotland to 45% (arable) and 56% (grass) in north-east England. Percentage in K Index 0 or 1 varied from 26% (arable) in south-east England and 34% (grass) in East Anglia to 56% (arable) and 54% (grass) in north-east England. (The proportion of samples above target Index was especially large in Northern Ireland, Scotland and north-west England).

1. Background

The Professional Agricultural Analysis Group (PAAG) was established in 2009 to help ensure a common quality standard amongst participating laboratories and to promote the benefits of soil analysis for efficient nutrient management. One of the early actions agreed by the PAAG was the collation of their UK soil analytical data to show breakdown by pH class and by P, K and Mg Indices.

This report covers the first collation of analytical data provided by participants for the period 1st June 2008 to 31st May 2009. It is anticipated that a similar collation will be performed annually. Identities of farms or advisers who had submitted soil samples for analysis were removed before PAAG participants sent their data to Ecopt.

2. Data Provided

Data comprised results of soil analyses - Olsen for P, ammonium nitrate extraction for K and Mg and 2.5:1 water:soil for pH. The amount and breakdown of data varied among participants. Data provided by some participants derived from several tens of thousands of samples, that from others derived from a few hundred samples. Some provided data that could be broken down by arable and grass and by location within the UK. Others provided data that could not be broken down further than UK. Some provided individual sample data, others aggregated data. Datasets were constructed for current year UK data, for data broken down into grass and arable, and into geographical regions. Data from every participant were allocated to the various datasets to the greatest extent possible. Consequently, sample record numbers vary among datasets and the sums of grass and arable sample records, or of regional sample records, do not equal the UK total.

3. Dataset classes

For every dataset, numbers of sample records in different pH classes and soil Indices (Table 1) were counted and expressed as percentages of the total number of samples in that dataset.

Table 1 Classes used for the collation

pH	P Index	K Index	Mg Index
<5.00	0	0	0
5.00-5.49	1	1	1
5.50-5.99	2	2-	2
6.00-6.49	3	2+	3
6.50-6.99	4	3	4
7.00-7.49	5	4	5
7.50-7.99	>5	5	6
>7.99		>5	>6

Only data that could be allocated to these classes (and to the June 1st to May 31st year) were used in the analyses.

4. Interpretation of the Data

Particular care is needed when drawing conclusions from the data. Firstly, soil samples submitted to laboratories are not randomly selected from the total population of fields. Technically aware farmers probably are more likely to use soil analysis in decision-making and their soils may be maintained at higher levels of available nutrients than are present in the population mean. Secondly, amounts and sources of data differed between the various datasets used. Several laboratories contributed to the collation of total samples for the UK. Fewer provided data for grass and arable soils separately, or by region. The collation of the data therefore was not statistically rigorous. Nevertheless, broad trends can be identified and some conclusions drawn.

5. Collation of Data

5.1 Datasets

The current year was June 1st 2009 to May 31st 2009. Data sets were established for:

UK data across all crops and grass
UK data for arable samples
UK data for grass samples
Regional data across crops and grass
Regional data for arable samples
Regional data for grass samples

5.2 UK Data Across All Crops and Grass

Results of 123,343 (pH), 129,261 (P), 123,009 (K) 112,039 (Mg) samples were available for the current year.

Mean soil pH was 6.63, 29% of samples were below 6.00 and 41% were between 6.00 and 7.00.

Only 29% of samples were at target soil P and K Indices (2 and 2- respectively). Soil P was lower than target Index in 27% of samples and soil K was lower than target in 38% of samples. Soil Mg Index was lower than 2 in 16% of samples (Table 2, Fig 1).

Table 2: Soil pH and Indices - all samples

				Percentage of samples in class:				
Soil pH	**<5.0**	**5.00-5.49**	**5.50-5.99**	**6.00-6.49**	**6.50-6.99**	**7.00-7.49**	**7.50-7.99**	**>8.0**
All samples	1	7	21	23	18	12	11	6

			Percentage of samples in Index:				
P Index	**0**	**1**	**2**	**3**	**4**	**5**	**>5**
All samples	8	19	29	29	10	3	2

			Percentage of samples in Index:					
K Index	**0**	**1**	**2-**	**2+**	**3**	**4**	**5**	**>5**
All samples	6	32	29	16	13	3	1	0

			Percentage of samples in Index:					
Mg Index	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**>6**
All samples	1	15	32	27	12	7	5	1

Fig 1a Distribution of soil pH values
(All samples)

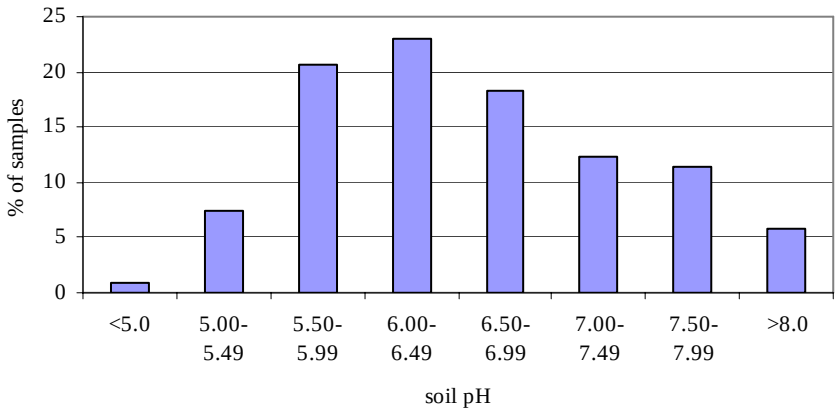


Fig 1b Distribution of soil P Index values
(All samples)

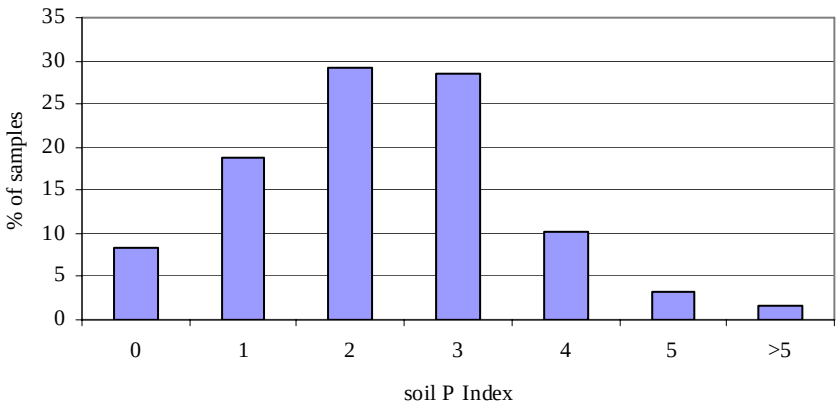
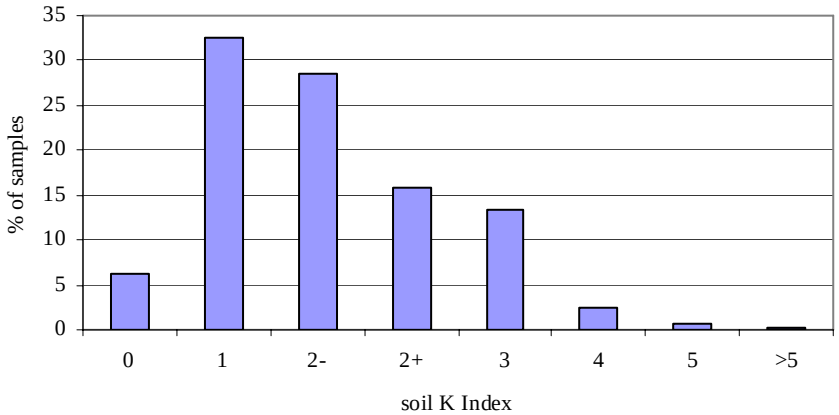
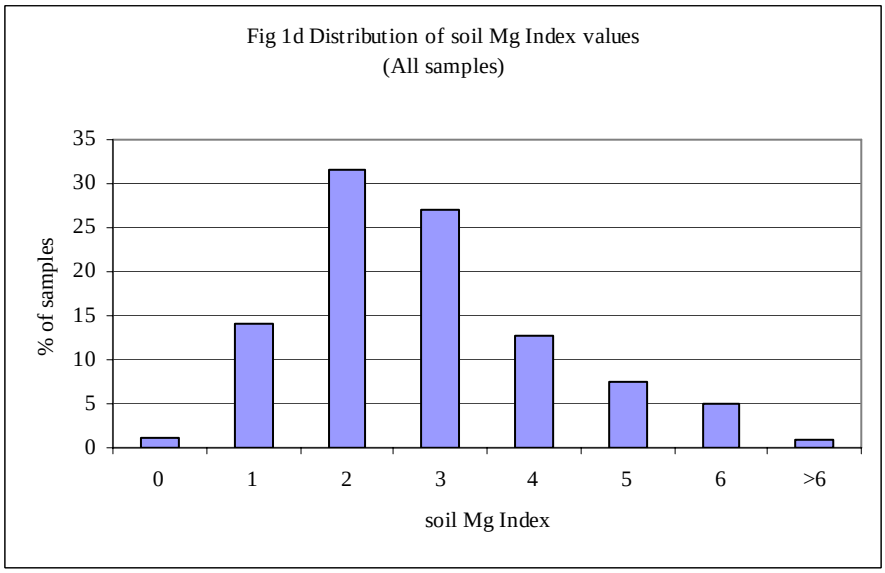


Fig 1c Distribution of soil K Index values
(All samples)





Two laboratories provided data for individual samples and these were used to calculate correlation coefficients between pairs of measured variables (Table 3). For P, K and Mg, data as mg/l were used. Owing to the large numbers of samples, all of the coefficients shown in Table 3, except that between P and Mg in laboratory B data, were statistically significant ($P<0.01$). None of the correlations was strong though, apart from pH and Mg, there was reasonable consistency between laboratories.

Table 3 Correlation between measured variables

	Laboratory A	**Laboratory B**
Number of samples	45462	56858
	Correlation coefficient	
pH and P	-0.026	-0.012
pH and K	0.185	0.276
pH and Mg	-0.203	0.022
P and K	0.371	0.290
P and Mg	0.012	0.005
K and Mg	0.284	0.177

5.3 UK Data by Arable and Grass

Some participants provided data broken down by grass and arable as current crop. These data (30842 samples for arable and 14619 for grass) are summarised in Table 4 and Fig 2.

Soil pH tended to be higher in arable than in grass and there was an indication of a double population in arable samples with peaks at 6.0-7.0 and at 7.5-8.0. This could be due to samples from calcareous soils that probably were predominantly arable. Mean and median pH for arable were 6.84 and 6.81 and for grass 5.96 and 5.85 respectively.

The distribution of soil P values was similar for arable and grass with mean values of 29 mg/l (Index 3) for arable and 28 mg/l (Index 3) for grass. Distribution of values was slightly skewed for grass with a median value of 23 mg/l (Index 2). Median was 29 mg/l for arable. Only around 30% of arable and grass samples were at target Index 2 with 21% (arable) and 28% (grass) in Indices 0 or 1.

Soil K values also were somewhat similar with means of 166 mg/l (Index 2-) for arable and 154 mg/l (Index 2-) for grass. Distributions were skewed with median values of 145 mg/l (Index 2-) for arable and 128 mg/l (Index 2-) for grass. Only 32% of arable and 26% of grass samples were at target Index 2- and 35% (arable) and 45% (grass) were in Indices 0 or 1.

There was a more noticeable difference between arable and grass in soil Mg. Mean value was lower for arable (108 mg/l, Index 3) than for grass (145 mg/l, Index 3). Distributions were strongly skewed with median values of 78 mg/l (Index 2) for arable and 119 mg/l (Index 3) for grass. Only 5% of grass, but 27% of arable, samples were in Indices 0 or 1.

Table 4 Soil pH and Indices by arable and grass

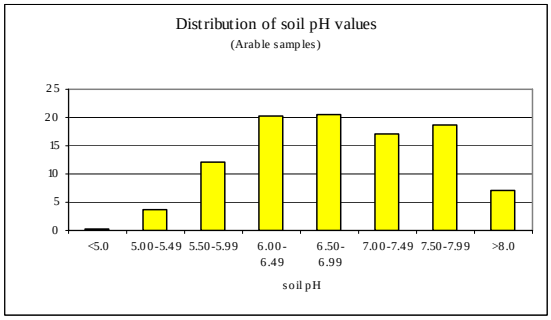
				Percentage of samples in class:				
Soil pH	**<5.0**	**5.00-5.49**	**5.50-5.99**	**6.00-6.49**	**6.50-6.99**	**7.00-7.49**	**7.50-7.99**	**>8.0**
Arable	0	4	12	20	21	17	19	7
Grass	2	19	41	23	8	3	3	1

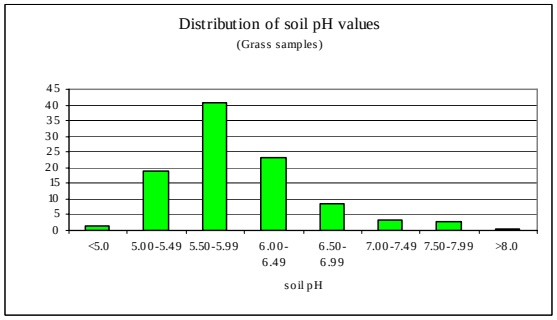
			Percentage of samples in Index:				
P Index	**0**	**1**	**2**	**3**	**4**	**5**	**>5**
Arable	4	17	32	33	11	3	0
Grass	9	19	28	30	11	3	1

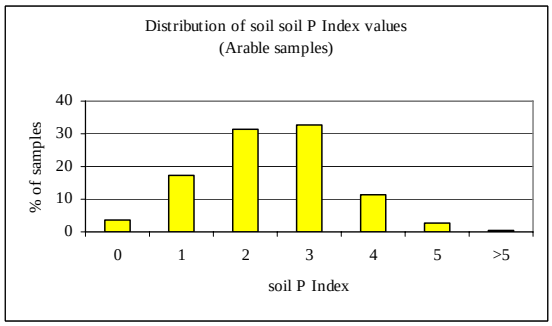
			Percentage of samples in Index:					
K Index	**0**	**1**	**2-**	**2+**	**3**	**4**	**5**	**>5**
Arable	4	31	32	18	13	2	0	0
Grass	9	36	26	14	12	2	1	0

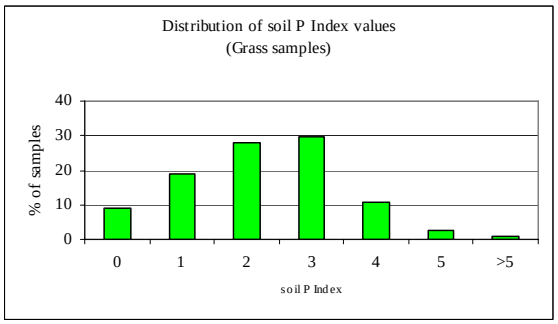
			Percentage of samples in Index:					
Mg Index	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**>6**
Arable	3	24	35	22	8	5	2	0
Grass	0	5	32	38	14	7	3	1

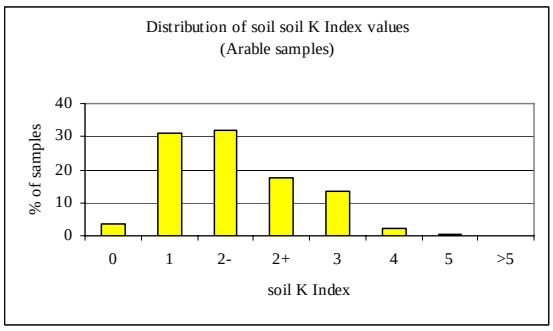
Fig 2 Distributions by arable and grass

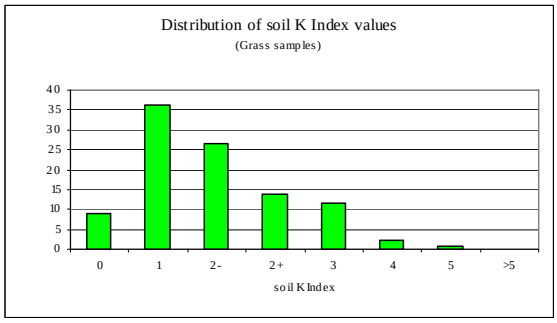


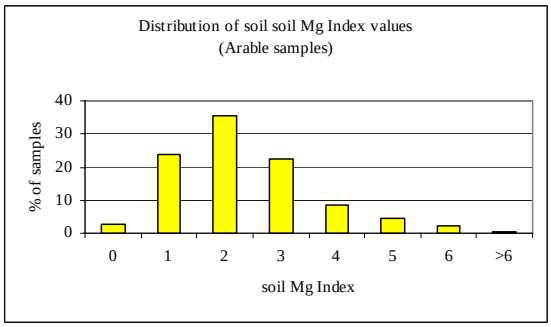


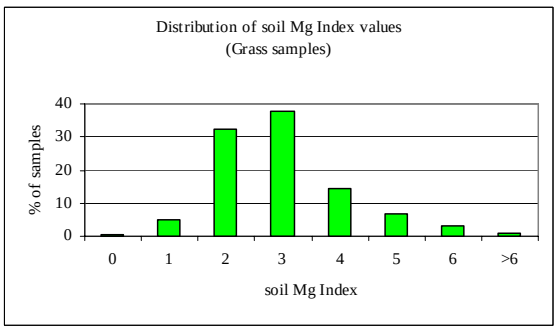






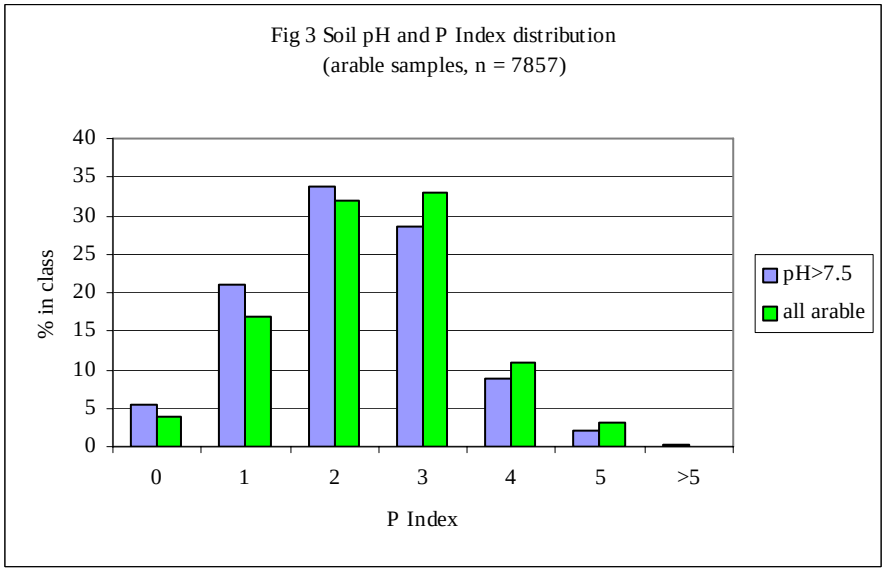




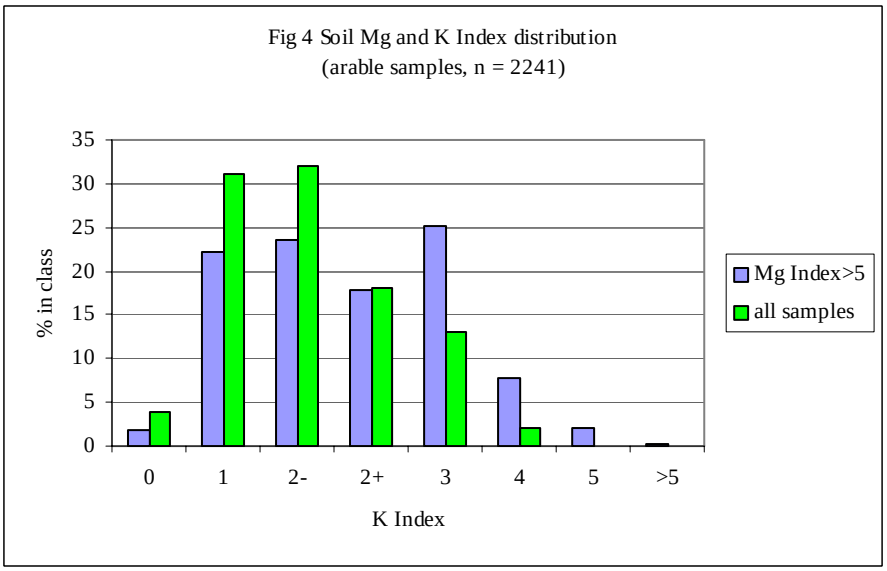


Correlations between analytical variables were calculated separately for grass and arable samples. However, this added little to the conclusions drawn for combined arable and grass samples (Table 3). There were weak but significant ($P<0.01$) correlations between soil P (mg/l) and K (mg/l) in arable ($n = 30842$, $r = 0.317$) and in grass samples ($n = 14619$, $r = 0.461$). There also were weak but significant correlations between soil K (mg/l) and soil Mg (mg/l) in arable ($r = 0.272$) and grass ($r = 0.346$). There was little correlation between soil pH and soil P (mg/l) in arable ($r = -0.067$) or in grass samples ($r = 0.008$).

The relationship between soil pH and P Index was further tested by calculating the distribution of soil P Indices for arable samples where pH was >7.5 and comparing this with the distribution for all arable samples (Fig 3). There was some indication that P Index tended to be lower for pH >7.5 (27% of samples in Indices 0 or 1 compared to 21% for all samples).



The relationship between soil Mg Index and K Index was tested by calculating the distribution of soil K Indices for arable samples where Mg Index was >4 and comparing this with the distribution for all arable samples (Fig 4). The distribution of K Indices was somewhat erratic in the high Mg samples but there was no indication that the Index tended to be lower in the high Mg soils – if anything, the Index tended to be higher.



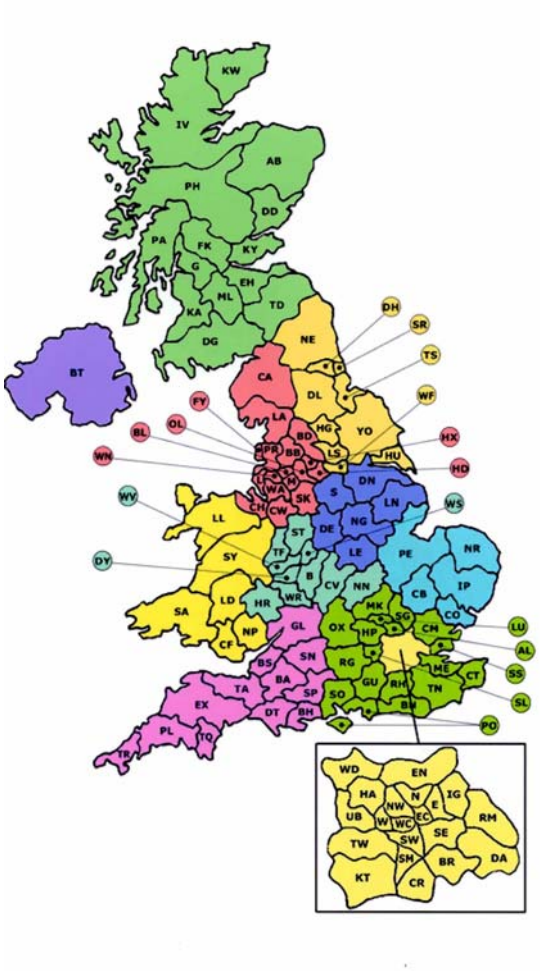
5.4 Data by Region

Several methods for a regional breakdown were tried. Allocation of data to counties proved too time consuming as the last address item often was parish. Defining regions by postal code involved some difficulties as parts of several counties (eg. Essex, Shropshire, Lincolnshire) were in different postal codes and in different regions. However, this method was practically feasible as, where necessary, it was quicker to allocate parish names to regions than to counties. Where only the county was known for an address and the county was split between postal codes, sample data were allocated to the postal code that was attached to the larger part of the county area (e.g. all 'Essex' samples were allocated to CM and all 'Lincolnshire' samples to LN).

Ten regions were defined for the collation:

Wales
Northern Ireland
Scotland
North East
North West
East Midlands
West Midlands
East Anglia
South East
South West

Regional boundaries were by postal code (map below).



Proportions of samples in different pH and Index classes are summarised below for arable and grass separately. Data and diagrams for combined arable and grass samples are shown in Appendix1.

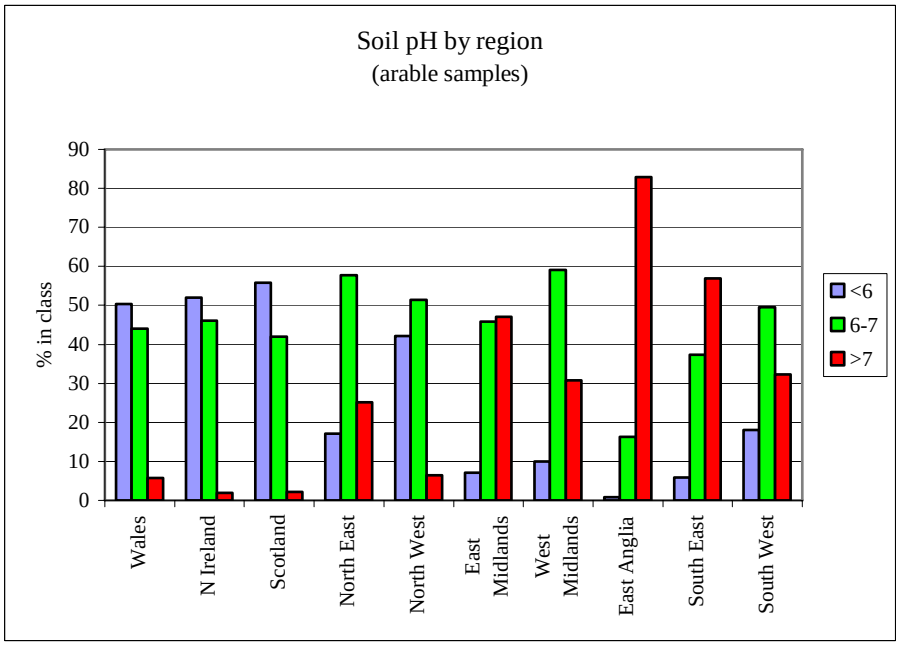
Soil pH

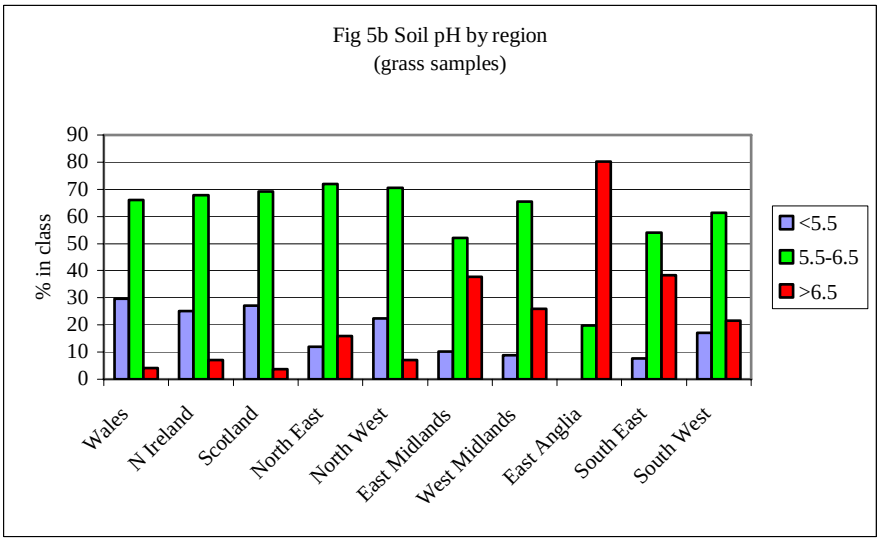
In arable samples, there were clear differences between Scotland, Northern Ireland, Wales and northern England, and the rest of England (Table 5, Fig 5). The proportion of samples with pH <6 was smaller in the Midlands and southern England.

There was a similar, but less pronounced, geographical pattern in grass samples. The greatest need for liming appeared to be in Scotland, Wales and Northern Ireland.

Table 5 Soil pH by region

	Percentage of samples							
Arable	**<5.0**	**5.00-5.49**	**5.50-5.99**	**6.00-6.49**	**6.50-6.99**	**7.00-7.49**	**7.50-7.99**	**>8.0**
Wales	2	16	33	28	16	4	2	0
N Ireland	0	13	39	36	10	2	0	0
Scotland	1	14	41	32	10	2	0	0
North East	0	3	14	29	29	15	8	2
North West	1	11	30	33	19	5	2	0
East Midlands	0	2	5	18	27	26	15	6
West Midlands	0	1	8	26	34	19	11	1
East Anglia	0	0	1	4	12	27	40	16
South East	0	1	4	15	22	21	25	10
South West	0	4	14	28	22	12	15	6
Grass								
Wales	3	27	47	19	3	1	0	0
N Ireland	3	22	46	22	5	1	0	0
Scotland	2	25	49	21	3	0	0	0
North East	1	11	42	30	11	3	1	0
North West	1	21	49	21	6	1	0	0
East Midlands	1	9	26	26	24	9	4	1
West Midlands	1	8	29	36	18	4	4	0
East Anglia	0	0	5	15	13	24	35	8
South East	1	7	26	28	16	7	11	4
South West	1	16	36	26	10	6	4	1





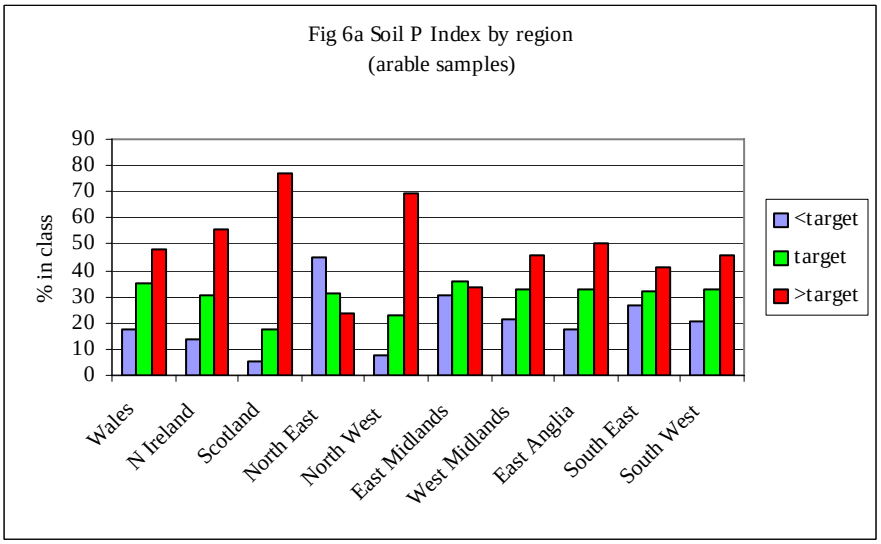
Soil P Index

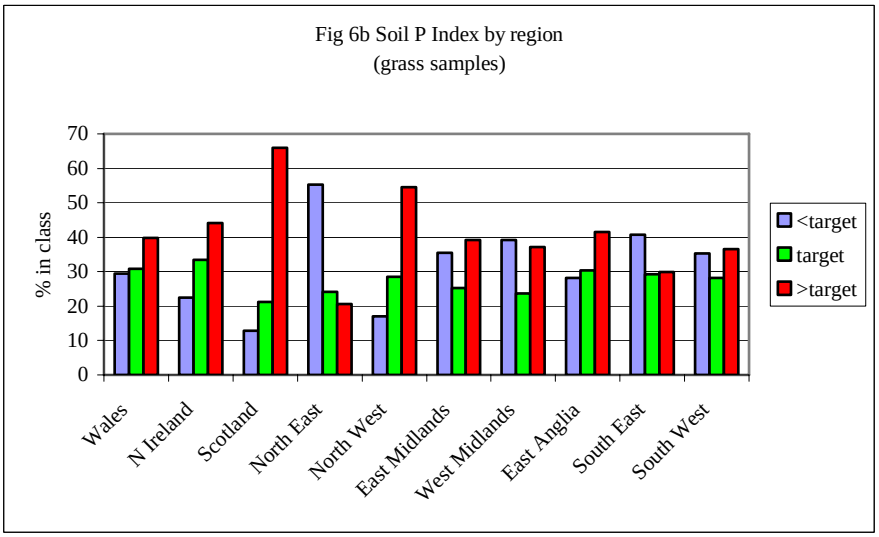
Fewer than 40% of arable samples (just 18% in Scotland) were at target Index in any region (Table 6, Fig 6). In all regions except north-east England, a greater proportion of samples was above than was below target Index.

The proportions of samples below target Index generally was larger for grass than it was for arable soils. Proportions above target Index were especially large in Scotland and north-west England.

Table 6 Soil P Index by region

	Percentage of samples in Index:						
Arable	**0**	**1**	**2**	**3**	**4**	**5**	**>5**
Wales	3	14	35	38	8	2	0
N Ireland	2	12	30	40	13	2	0
Scotland	1	4	18	46	25	6	1
North East	12	33	32	19	4	1	0
North West	1	7	23	43	20	6	0
East Midlands	6	25	36	25	7	2	0
West Midlands	3	19	33	32	11	2	0
East Anglia	2	15	33	36	11	2	0
South East	6	21	32	28	9	3	1
South West	4	17	33	31	11	3	1
Grass							
Wales	9	21	31	31	7	1	0
N Ireland	5	17	34	32	10	2	0
Scotland	3	10	21	35	22	7	2
North East	20	36	24	15	3	1	1
North West	4	13	28	38	13	3	0
East Midlands	16	20	25	21	10	5	3
West Midlands	18	21	24	27	8	2	0
East Anglia	8	20	30	29	11	1	0
South East	13	28	29	19	8	2	1
South West	13	22	28	26	9	2	0



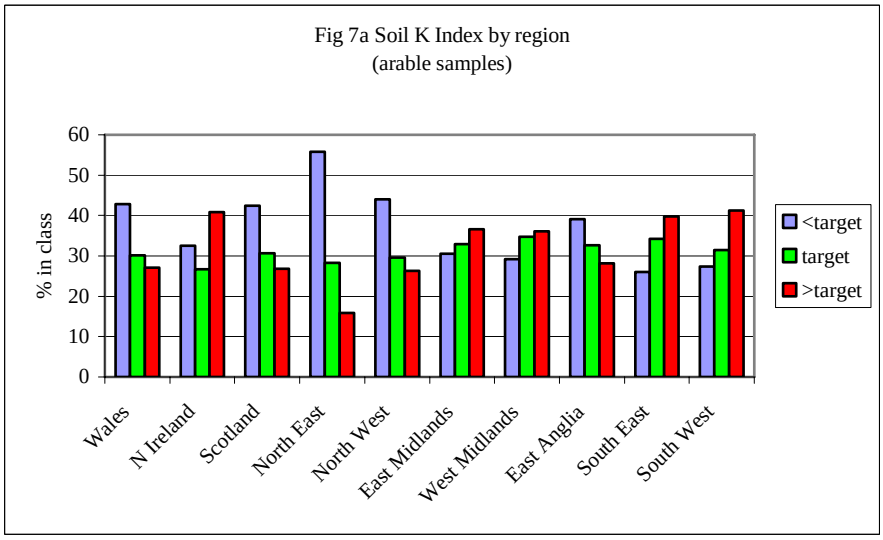


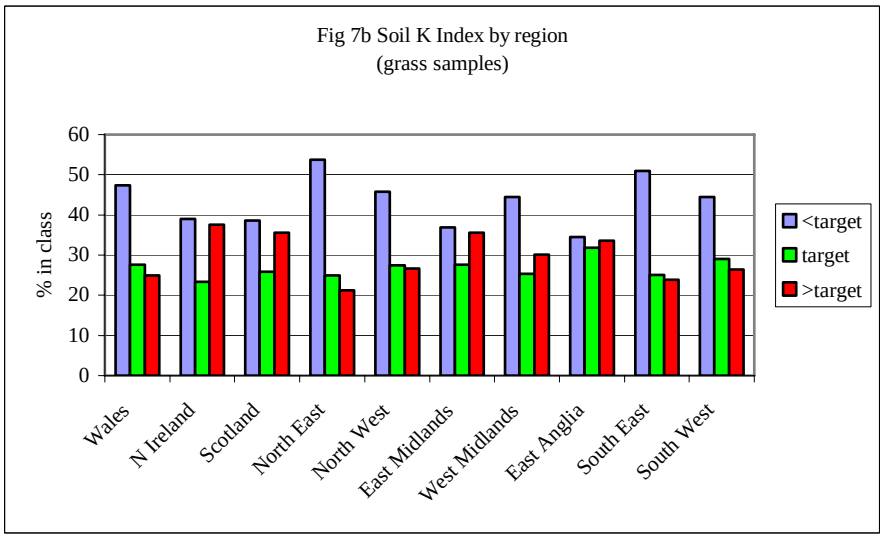
Soil K Index

Generally, higher proportions of arable and grass samples were below target K Index than were below target P Index (Table 7, Fig 7). Larger proportions of arable samples were below target Index than above it in Wales, Scotland, north-east England, north-west England and East Anglia. The proportion below target Index was larger in all regions for grass samples.

Table 7 Soil K Index by region

	Percentage of samples in Index:							
Arable	**0**	**1**	**2-**	**2+**	**3**	**4**	**5**	**>5**
Wales	6	37	30	15	9	2	0	0
N Ireland	4	28	27	21	15	4	1	0
Scotland	9	33	31	16	10	1	0	0
North East	7	49	28	10	5	1	0	0
North West	6	38	30	13	12	1	0	0
East Midlands	2	28	33	18	15	3	1	0
West Midlands	2	27	35	20	14	2	0	0
East Anglia	3	36	33	13	12	2	0	0
South East	2	24	34	21	15	3	1	0
South West	3	24	31	21	17	3	0	0
Grass								
Wales	8	40	28	13	10	2	0	0
N Ireland	8	31	23	15	17	3	2	0
Scotland	11	28	26	18	15	2	0	0
North East	12	42	25	10	8	1	1	0
North West	7	39	27	14	11	1	0	0
East Midlands	3	34	28	14	14	5	1	1
West Midlands	7	38	25	12	14	3	1	0
East Anglia	7	27	32	16	13	4	1	0
South East	10	41	25	12	9	2	0	0
South West	10	35	29	13	10	3	1	0





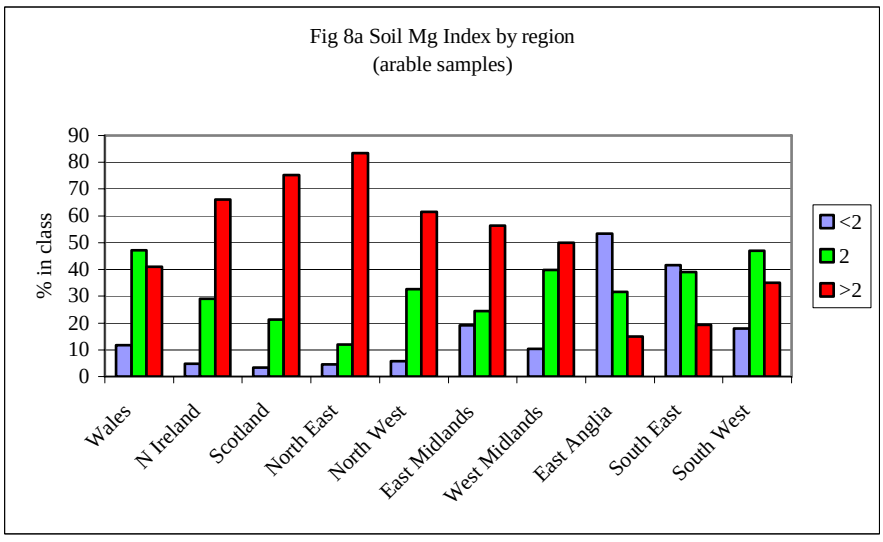
Soil Mg Index

Magnesium application is recommended for some arable crops where the soil Index is 0 or 1. The proportion of arable soil is these Indices exceeded 10% only in East Anglia, south-east England and south-west England (Table 8). In other regions, the proportion of samples above Index 2 was larger than that below.

The proportion of grass samples in Index 0 or 1 exceeded 10% only in East Anglia and south-east England. In the main grassland regions, very small proportions of samples were below Index 2.

Table 8 Soil Mg Index by region

	Percentage of samples in Index:							
Arable	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**>6**
Wales	1	11	47	30	9	2	0	0
N Ireland	0	5	29	28	10	11	12	6
Scotland	0	3	21	45	22	8	0	0
North East	0	4	12	29	32	18	4	0
North West	0	6	33	43	14	4	1	0
East Midlands	2	17	25	26	11	10	8	1
West Midlands	1	10	40	32	8	6	3	1
East Anglia	6	47	32	9	3	2	1	0
South East	5	37	39	13	3	2	1	0
South West	1	17	47	23	6	4	2	0
Grass								
Wales	0	4	46	38	10	2	0	0
N Ireland	0	3	19	26	13	13	19	7
Scotland	0	2	19	46	22	9	2	0
North East	0	1	7	36	32	18	6	0
North West	0	1	32	46	15	5	1	0
East Midlands	0	2	16	29	23	16	9	4
West Midlands	0	2	28	35	17	7	6	4
East Anglia	6	26	41	17	6	3	3	0
South East	1	13	45	32	7	1	1	0
South West	0	5	38	36	11	6	3	1



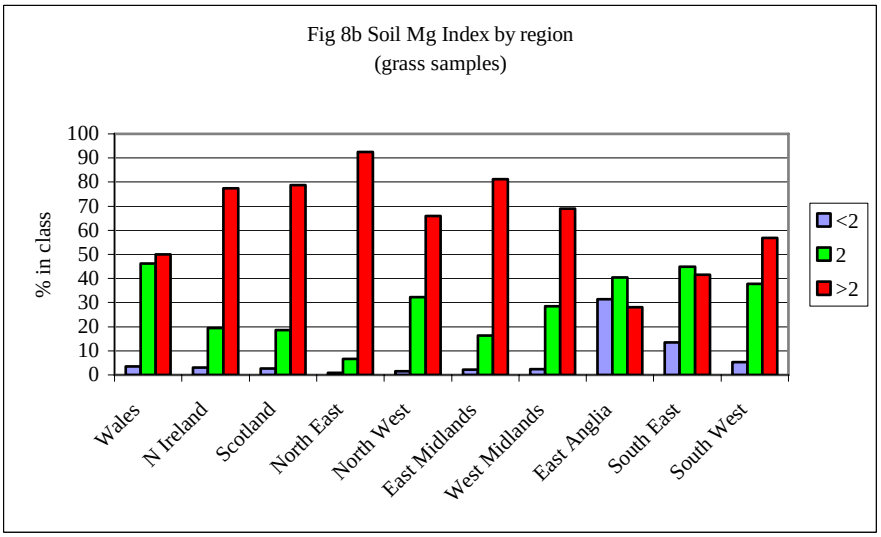


Fig 8b Soil Mg Index by region
(grass samples)
% in class
100
90
80
70
60
50
40
30
20
10
0
Wales
N Ireland
Scotland
North East
North West
East Midlands
West Midlands
East Anglia
South East
South West
<2
2
>2

Appendix 1

Data by Regions

Numbers of samples used in the collation of data by regions were:

	No. samples		
	Arable	**Grass**	**Total**
Wales	1112	2392	3504
N Ireland	852	889	1741
Scotland	1350	2013	3363
North East	1741	803	2544
North West	1496	1950	3446
East Midlands	1368	352	1720
West Midlands	1901	537	2438
East Anglia	5620	217	5837
South East	3798	782	4580
South West	3518	1995	5513

The table and diagrams below show the percentages of all samples (arable + grass) in pH and Index classes.

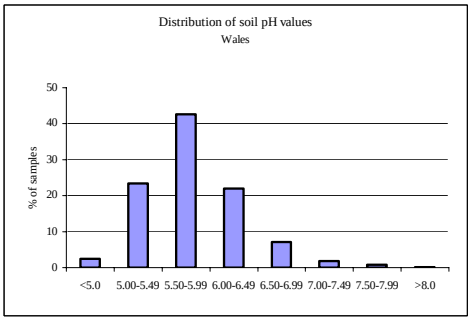
Arable + grass samples

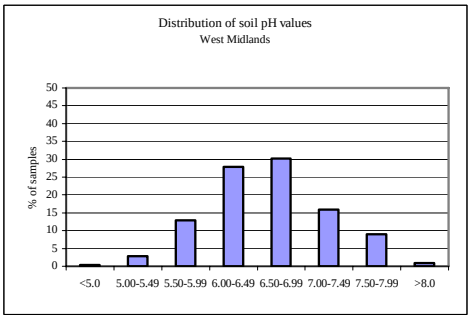
	Percentage of samples							
pH	**<5.0**	**5.00-5.49**	**5.50-5.99**	**6.00-6.49**	**6.50-6.99**	**7.00-7.49**	**7.50-7.99**	**>8.0**
Wales	2	23	43	22	7	2	1	0
N Ireland	2	18	42	29	8	2	0	0
Scotland	2	21	45	25	6	1	0	0
North East	0	5	23	29	23	11	6	1
North West	1	17	41	26	11	3	1	0
East Midlands	1	3	9	20	27	22	13	5
West Midlands	0	3	13	28	30	16	9	1
East Anglia	0	0	1	5	12	27	40	16
South East	0	2	8	18	21	19	23	9
South West	1	8	22	27	18	10	11	4

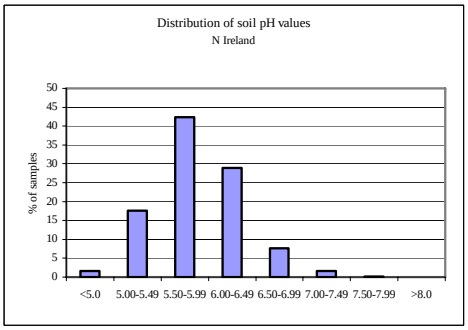
	Percentage of samples in Index:						
P Index	**0**	**1**	**2**	**3**	**4**	**5**	**>5**
Wales	7	19	32	33	8	1	0
N Ireland	4	15	32	36	11	2	0
Scotland	2	8	20	39	23	7	1
North East	14	34	29	18	4	1	0
North West	3	10	26	40	16	4	0
East Midlands	8	24	34	24	7	2	1
West Midlands	6	19	31	31	10	2	0
East Anglia	3	15	33	36	11	2	0
South East	7	22	31	27	9	3	1
South West	7	19	31	29	10	3	1

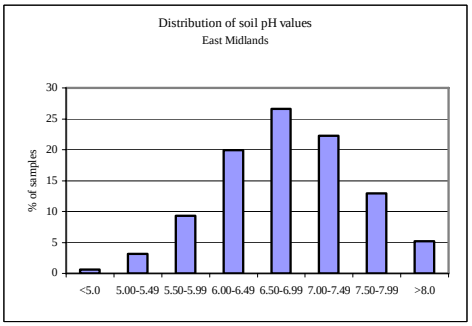
	Percentage of samples in Index:							
K Index	**0**	**1**	**2-**	**2+**	**3**	**4**	**5**	**>5**
Wales	7	39	28	14	10	2	0	0
N Ireland	6	30	25	18	16	3	2	0
Scotland	10	30	28	17	13	2	0	0
North East	8	47	27	10	6	1	0	0
North West	6	39	28	14	11	1	0	0
East Midlands	2	30	32	17	14	3	1	0
West Midlands	3	30	33	18	14	2	0	0
East Anglia	3	36	33	13	12	3	0	0
South East	4	27	33	20	14	3	1	0
South West	5	28	31	18	14	3	1	0

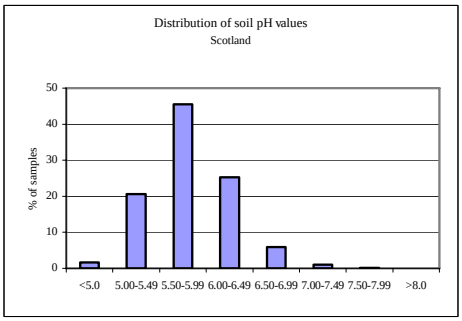
	Percentage of samples in Index:							
Mg Index	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**>6**
Wales	0	6	47	35	9	2	0	0
N Ireland	0	4	24	27	11	12	16	6
Scotland	0	3	20	46	22	9	1	0
North East	0	3	10	32	32	18	5	0
North West	0	3	33	45	14	4	1	0
East Midlands	2	14	23	27	13	12	8	1
West Midlands	1	8	37	33	10	6	4	1
East Anglia	6	46	32	9	4	2	1	0
South East	4	33	40	17	4	2	1	0
South West	1	13	44	28	8	4	3	1

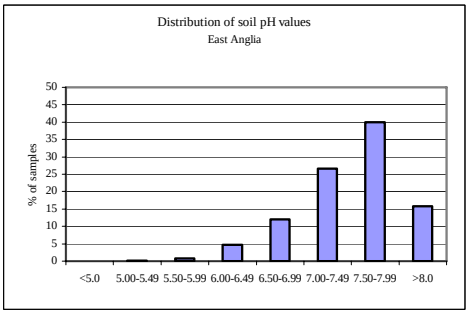

Distribution of soil pH values
Wales
% of samples
0
10
20
30
40
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

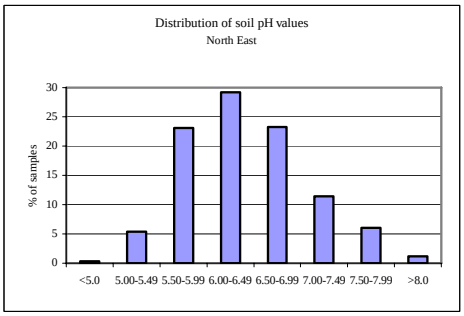

Distribution of soil pH values
West Midlands
% of samples
0
5
10
15
20
25
30
35
40
45
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

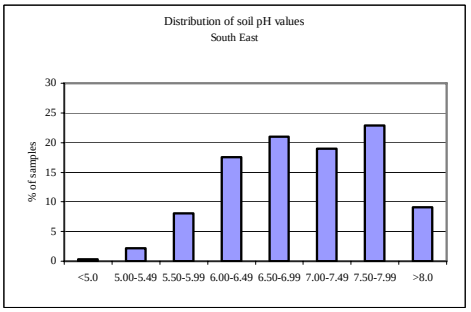

Distribution of soil pH values
N Ireland
% of samples
0
5
10
15
20
25
30
35
40
45
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

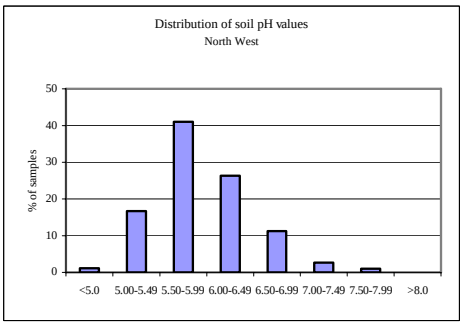

Distribution of soil pH values
East Midlands
% of samples
0
5
10
15
20
25
30
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

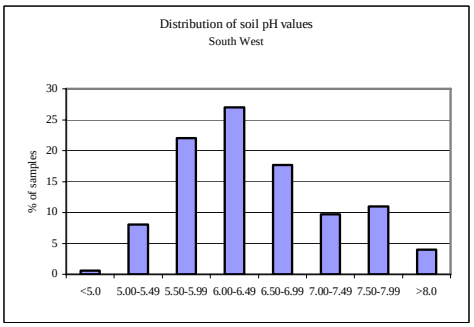

Distribution of soil pH values
Scotland
% of samples
0
10
20
30
40
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

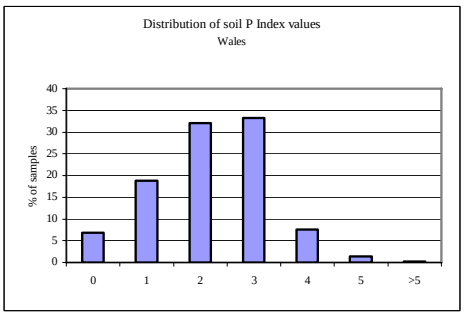

Distribution of soil pH values
East Anglia
% of samples
0
5
10
15
20
25
30
35
40
45
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

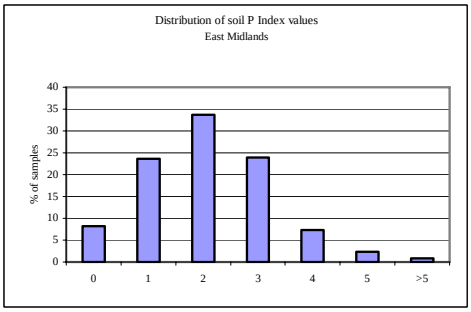

Distribution of soil pH values
North East
% of samples
0
5
10
15
20
25
30
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

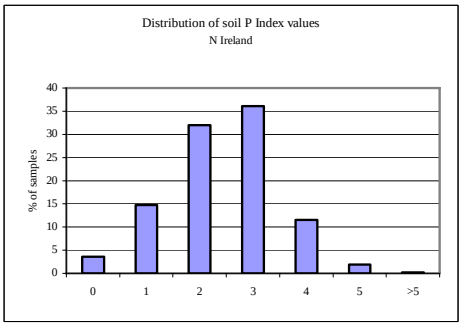

Distribution of soil pH values
South East
% of samples
0
5
10
15
20
25
30
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

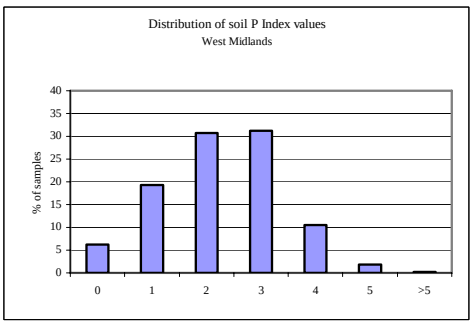

Distribution of soil pH values
North West
% of samples
0
10
20
30
40
50
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

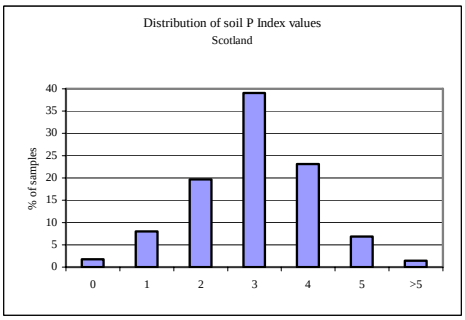

Distribution of soil pH values
South West
% of samples
0
5
10
15
20
25
30
<5.0
5.00-5.49
5.50-5.99
6.00-6.49
6.50-6.99
7.00-7.49
7.50-7.99
>8.0

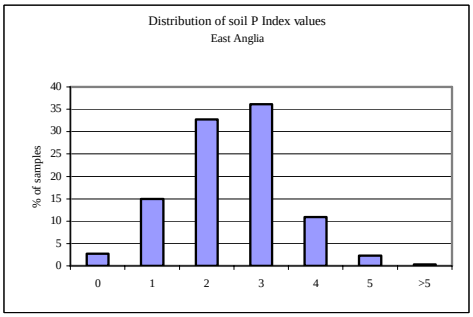

Distribution of soil P Index values
Wales
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

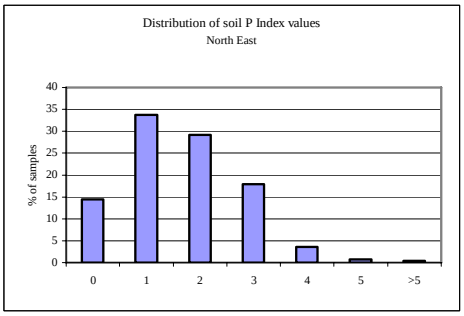

Distribution of soil P Index values
East Midlands
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

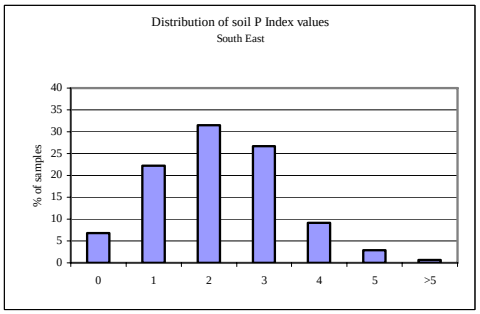

Distribution of soil P Index values
N Ireland
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

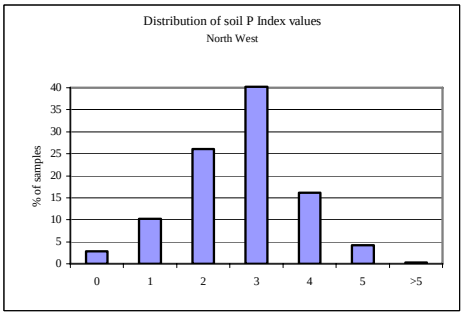

Distribution of soil P Index values
West Midlands
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

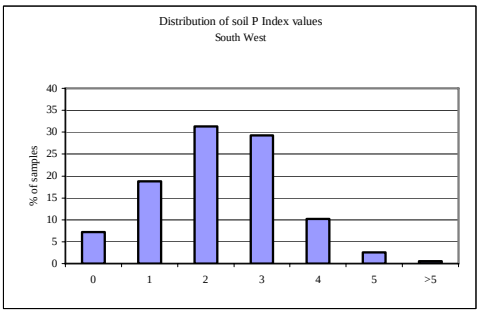

Distribution of soil P Index values
Scotland
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

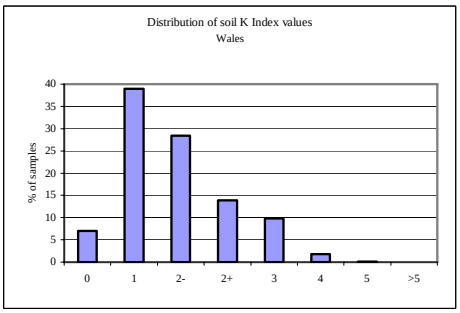

Distribution of soil P Index values
East Anglia
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

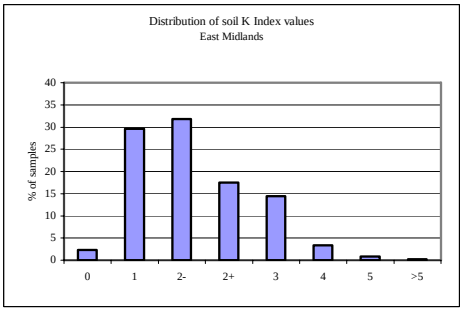

Distribution of soil P Index values
North East
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

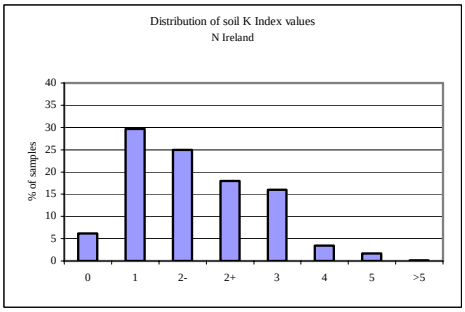

Distribution of soil P Index values
South East
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

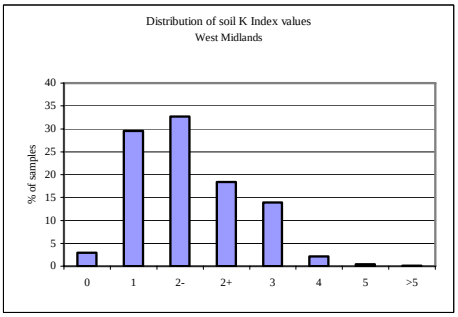

Distribution of soil P Index values
North West
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

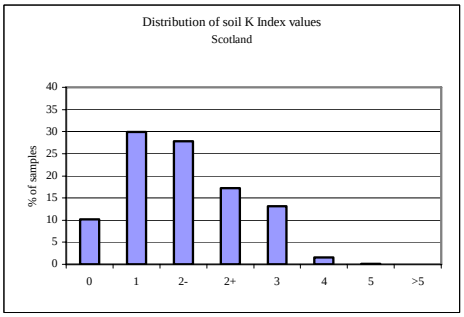

Distribution of soil P Index values
South West
% of samples
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 >5

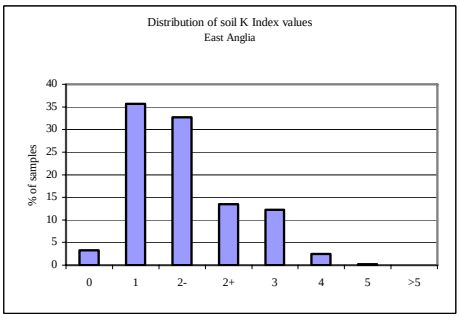

Distribution of soil K Index values
Wales
% of samples
0 1 2- 2+ 3 4 5 >5

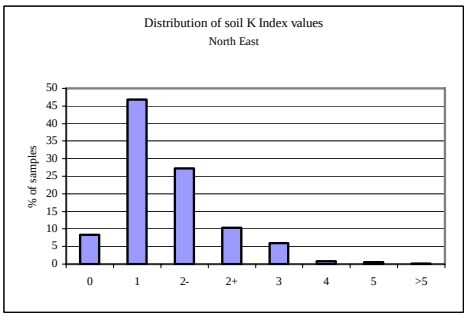

Distribution of soil K Index values
East Midlands
% of samples
0 1 2- 2+ 3 4 5 >5

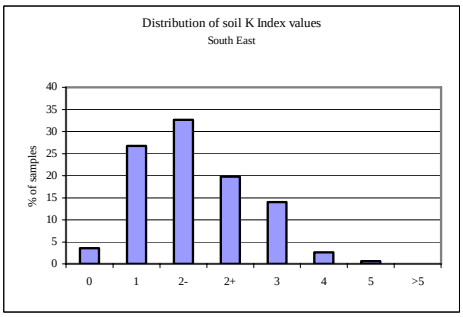

Distribution of soil K Index values
N Ireland
% of samples
0 1 2- 2+ 3 4 5 >5

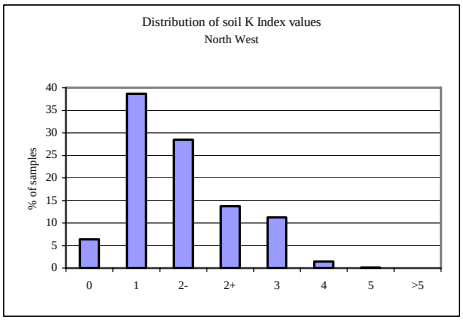

Distribution of soil K Index values
West Midlands
% of samples
0 1 2- 2+ 3 4 5 >5

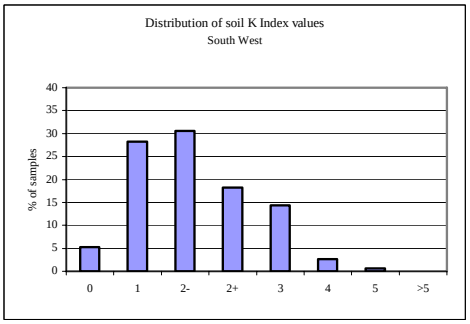

Distribution of soil K Index values
Scotland
% of samples
0 1 2- 2+ 3 4 5 >5


Distribution of soil K Index values
East Anglia
% of samples
0 1 2- 2+ 3 4 5 >5


Distribution of soil K Index values
North East
% of samples
0 1 2- 2+ 3 4 5 >5


Distribution of soil K Index values
South East
% of samples
0 1 2- 2+ 3 4 5 >5


Distribution of soil K Index values
North West
% of samples
0 1 2- 2+ 3 4 5 >5


Distribution of soil K Index values
South West
% of samples
0 1 2- 2+ 3 4 5 >5

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