

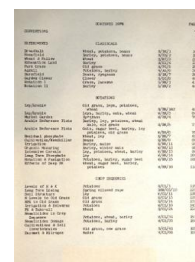
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76/R/RN/7 Residual Phosphate - Wheat, Ley

Rothamsted Research

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76/R/RN/7

RESIDUAL PHOSPHATE

Object: Originally to study the fresh and residual effects of phosphate fertiliser on the yields of three arable crops grown in rotation. Since 1974 the effects on ley and on yield and pathogens of continuous wheat are also studied - Great Field IV and Sawyers I.

Sponsors: G.E.G. Mattingly, D.B. Slope.

The 17th year, ley (Great Field IV): wheat (Sawyers I).

For previous years see 'Details' 1967, 68/B/5(t), 69/R/RN/7, 70/R/RN/7(t) and 71-75/R/RN/7.

Design: Gt. Field IV: 3 series each of 1 randomised block of 12 plots.
Sawyers I: 3 series each of 2 randomised blocks of 12 plots.

Whole plot dimensions:

Gt. Field IV: 4.27 x 18.3

Sawyers I: 4.27 x 20.1

Treatments:

P205 Rates and frequency of applying phosphate:-

NONE 0

Annual dressings, kg P205:

29 ANN	29
57 ANN	57
115 ANN	115
172 ANN	172

Triennial dressings, kg P205 (last applied 1975):

86 TRI	86
172 TRI	172

Six-yearly dressings, kg P205 (last applied 1973):

344 SIX	344
688 SIX	688
1032 SIX	1032

Single dressing, kg P205 (applied autumn 1969):

376 G(1)	376 as Gafsa rock phosphate
376 S(1)	376 as granular superphosphate

76/R/RN/7

- NOTES: (1) Since 1974 the original rotation of potatoes, barley, swedes on both fields has been changed. Blocks after barley have been sown to continuous wheat on Sawyers I, to ley on Great Field IV.
- (2) Since 1960 all phosphate has been applied as superphosphate.
- (3) The six-yearly dressings were applied half in autumn before ploughing, half in spring.
- (4) The ley sown in 1974 established poorly. It was ploughed and resown in 1975.

Standard applications:

Leys (Gt. Field IV only): Manures: K20 at 250 kg as muriate of potash Chalk at 3.1 t (1st year ley only).

Wheat (Sawyers I only): Manures: K20 at 90 kg as muriate of potash.

'Nitro-Chalk' at 500 kg. Chalk at 3.1 t (2nd cereal only).

Weedkillers: Paraquat at 0.56 kg ion in 220 l. (2nd and 3rd cereal only). Glyphosate at 1.7 kg in 220 l (4th cereal only).

Ioxynil at 0.53 kg with mecoprop at 1.6 kg (both as the potassium salt) in 450 l in spring.

Seed: Ley mixture: Meadow fescue, S215 at 9.3 kg, Contessa meadow fescue at 5.9 kg, S48 Timothy at 5.9 kg, N.Z Huia white clover at 2.1 kg, Wild white clover at 0.38 kg. Sown at 24 kg.

Wheat: Cappelle, sown at 190 kg.

Cultivations, etc.:-

Leys: First-year only: Chalk applied: 30 Sept, 1975. Ploughed:

26 Oct. Discd: 26 Feb, 1976. Treatment P applied: 27 Feb.

Standard K applied: 9 Apr. Power harrowed and sown: 21 Apr.

Topped: 14 and 29 June, 13 July, 18 Aug.

Second and third-year Leys: Standard K applied: 30 Dec, 1975. Treatment P applied: 27 Feb, 1976. Cut three times: 20 May, 28 June and 5 Nov.

Wheat: Glyphosate applied: 24 Sept, 1975. Chalk applied: 29 Sept.

Paraquat applied: 7 Oct. Ploughed: 19 Oct. Spring-tine cultivated, standard K and treatment P applied: 29 Oct. Power harrowed and sown:

30 Oct. N applied: 31 Mar, 1976. Spring-weedkiller applied: 28 Apr.

Combine harvested: 30 July.

NOTE: Incidence of take-all in wheat was measured in April and July.

76/R/RN/7 GREAT FIELD IV

SERIES II LEY

DRY MATTER TONNES/HECTARE

CUT 1 (20/5/76) CUT 2 (28/6/76) CUT 3(5/11/76) TOTAL OF 3 CUTS

P205				
NONE	2.46	0.88	1.49	4.83
29 ANN	2.73	1.07	1.80	5.60
57 ANN	2.94	1.48	2.14	6.56
115 ANN	2.92	1.56	1.88	6.37
172 ANN	1.87	1.38	1.96	5.22
86 TRI	2.81	1.46	1.63	5.90
172 TRI	2.11	1.15	1.96	5.22
344 SIX	3.05	1.77	2.11	6.93
688 SIX	2.21	1.16	1.97	5.34
1032 SIX	2.12	1.34	1.51	4.97
376 G(1)	2.64	1.23	1.93	5.80
376 S(1)	2.03	1.57	1.48	5.08
MEAN	2.49	1.34	1.82	5.65
MEAN DM%	20.4	32.9	13.5	22.3

PLOT AREA HARVESTED 0.00186

SERIES III LEY

DRY MATTER TONNES/HECTARE

CUT 1 (20/5/76) CUT 2 (28/6/76) CUT 3(5/11/76) TOTAL OF 3 CUTS

P205				
NONE	2.31	0.95	1.21	4.46
29 ANN	1.65	0.89	1.37	3.90
57 ANN	2.23	1.04	1.98	5.25
115 ANN	2.36	0.96	2.04	5.35
172 ANN	3.06	0.71	1.57	5.34
86 TRI	2.34	1.07	1.83	5.23
172 TRI	1.78	0.85	1.15	3.77
344 SIX	1.94	1.01	1.68	4.63
688 SIX	2.20	0.88	1.67	4.75
1032 SIX	2.66	1.01	1.50	5.17
376 G(1)	2.37	1.12	1.79	5.29
376 S(1)	1.84	0.66	1.52	4.02
MEAN	2.23	0.93	1.61	4.76
MEAN DM%	21.5	36.1	13.5	23.7

PLOT AREA HARVESTED 0.00186

76/R/RN/7 SAWYERS I

SERIES I 2ND CEREAL WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	4.31
29 ANN	4.86
57 ANN	4.27
115 ANN	4.16
172 ANN	4.35
86 TRI	4.25
172 TRI	4.21
344 SIX	4.24
688 SIX	4.47
1032 SIX	4.57
376 G(1)	3.90
376 S(1)	3.94
MEAN	4.29

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
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SED	0.324

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.324	7.5
GRAIN MEAN DM%	88.1		

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	3.70
29 ANN	4.41
57 ANN	4.73
115 ANN	4.43
172 ANN	4.60
86 TRI	4.21
172 TRI	4.30
344 SIX	4.10
688 SIX	4.35
1032 SIX	4.13
376 G(1)	3.92
376 S(1)	3.83
MEAN	4.23

STRAW MEAN DM% 90.4

PLOT AREA HARVESTED 0.00569

76/R/RN/7 SAWYERS I

SERIES II 3RD CEREAL WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.71
29 ANN	3.34
57 ANN	3.96
115 ANN	3.79
172 ANN	4.04
86 TRI	3.92
172 TRI	3.65
344 SIX	3.64
688 SIX	4.00
1032 SIX	4.27
376 G(1)	3.07
376 S(1)	3.50
MEAN	3.66

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
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SED	0.431

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.431	11.8
GRAIN MEAN DM%	88.1		

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.56
29 ANN	3.40
57 ANN	3.44
115 ANN	3.77
172 ANN	3.53
86 TRI	3.14
172 TRI	3.47
344 SIX	3.36
688 SIX	3.62
1032 SIX	3.78
376 G(1)	2.68
376 S(1)	2.86
MEAN	3.30

STRAW MEAN DM% 89.7

PLOT AREA HARVESTED 0.00569

76/R/RN/7 SAWYERS I

SERIES III 4TH CEREAL WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.53
29 ANN	2.99
57 ANN	3.16
115 ANN	3.21
172 ANN	3.39
86 TRI	2.50
172 TRI	3.47
344 SIX	2.75
688 SIX	3.26
1032 SIX	3.11
376 G(1)	2.29
376 S(1)	2.30
MEAN	2.91

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
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SED	0.549

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.549	18.9
GRAIN MEAN DM%	88.0		

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.28
29 ANN	2.79
57 ANN	2.85
115 ANN	2.63
172 ANN	2.70
86 TRI	2.22
172 TRI	2.66
344 SIX	2.62
688 SIX	2.64
1032 SIX	3.33
376 G(1)	2.00
376 S(1)	1.55
MEAN	2.52

STRAW MEAN DM% 91.0

PLOT AREA HARVESTED 0.00569