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

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78/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 19th year, ley (Great Field IV): wheat and ley (Sawyers I).

For previous years see 'Details' 1967 and 1973 and 74-77/R/RN/7.

Design: Great 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:

Great 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 1978):

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 1959):

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

NOTES: (1) Since 1974 the original rotation of potatoes, barley, swedes on both fields has been changed. Blocks after barley were sown to continuous wheat on Sawyers I, to ley on Great Field IV. In 1978 one block was sown to ley on Sawyers I.
(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.

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Standard applications:

Leys: (Great Field IV only): Manures: K_2O at 150 kg as muriate of potash.
(Sawyers I only): Manures: Chalk at 2.9 t, N at 60 kg 'Nitro-Chalk 25'
and K_2O at 250 kg as muriate of potash. Weedkillers: Paraquat at 0.42
kg ion in 220 l.

Wheat: (Sawyers I only): Manures: K_2O at 90 kg as muriate of potash. N
at 125 kg as 'Nitro-Chalk 25'. Weedkillers: Methabenzthiazuron at
3.1 kg in 220 l. Mecoprop with bromoxynil and ioxynil ('Brittox' at
3.5 kg) in 220 l.

Seed: Ley (Sawyers I only): Mixture of: Timothy (RvP Erecta), Meadow Fescue
(S.215) and White Clover (N.2 Huia), sown at 24 kg.

Wheat: Cappelle sown at 200 kg.

Cultivations, etc.:-

Leys: (Great Field IV): Standard K applied: 22 Dec, 1977. Test P applied:
15 Feb, 1978. Cut three times: 5 June, 25 July, 6 Nov.

(Sawyers I): Chalk applied: 20 Sept, 1977. Ploughed: 20 Oct. Disc
harrowed: 24 Oct. Standard N, K and test P applied: 19 May, 1978.

Paraquat applied: 22 May. Heavy spring-tine cultivated twice, rotary
harrowed twice, seed sown: 23 May. Topped: 27 July. Cut: 1 Sept, 30 Oct.

Wheat: (Sawyers I): Ploughed: 20 Oct, 1977. Disc harrowed: 24 Oct.

Standard K applied: 25 Oct. Heavy spring-tine cultivated: 26 Oct. Test P
applied, power harrowed, seed sown: 17 Nov. Methabenzthiazuron applied:
18 Nov. Standard N applied: 25 Apr, 1978. 'Brittox' applied: 11 May.
Combine harvested: 30 Aug.

NOTE: All wheat plots were sampled for take-all in May and take-all and eyespot
in July.

78/R/RN/7 GREAT FIELD IV

SERIES I LEY

DRY MATTER TONNES/HECTARE

CUT 1 (5/6/78) CUT 2 (25/7/78) CUT 3 (6/11/78) TOTAL OF 3 CUTS

P205				
NONE	4.39	2.00	2.29	8.68
29 ANN	5.31	2.32	2.71	10.34
57 ANN	4.43	2.24	2.71	9.37
115 ANN	5.02	2.36	2.53	9.92
172 ANN	4.73	2.62	2.54	9.89
86 TRI	4.22	2.22	2.81	9.24
172 TRI	4.00	2.87	2.18	9.05
344 SIX	4.76	2.42	2.31	9.48
688 SIX	4.59	2.55	2.31	9.44
1032 SIX	4.41	2.50	2.13	9.04
376 G(1)	4.59	2.41	2.39	9.39
376 S(1)	3.81	2.43	2.11	8.36
MEAN	4.52	2.41	2.42	9.35
MEAN DM%	15.3	17.0	20.6	17.7

PLOT AREA HARVESTED 0.00186

SERIES II LEY

DRY MATTER TONNES/HECTARE

CUT 1 (5/6/78) CUT 2 (25/7/78) CUT 3 (6/11/78) TOTAL OF 3 CUTS

P205				
NONE	3.67	2.09	1.99	7.75
29 ANN	3.96	2.53	2.34	8.83
57 ANN	3.95	2.85	2.96	9.76
115 ANN	4.79	2.98	2.54	10.31
172 ANN	4.52	2.87	2.74	10.14
86 TRI	4.35	2.54	2.47	9.36
172 TRI	4.00	3.00	2.39	9.39
344 SIX	4.64	3.01	2.60	10.26
688 SIX	3.73	2.74	2.46	8.93
1032 SIX	3.46	2.57	2.42	8.45
376 G(1)	3.93	2.79	2.34	9.06
376 S(1)	4.10	2.46	2.03	8.59
MEAN	4.09	2.70	2.44	9.24
MEAN DM%	13.9	18.2	22.8	18.3

PLOT AREA HARVESTED 0.00186

78/R/RN/7 GREAT FIELD IV

SERIES III LEY

DRY MATTER TONNES/HECTARE

CUT 1 (5/6/78) CUT 2 (25/7/78) CUT 3 (6/11/78) TOTAL OF 3 CUTS

P205				
NONE	3.78	2.04	1.41	7.24
29 ANN	4.25	2.53	1.87	8.65
57 ANN	4.20	2.83	2.46	9.48
115 ANN	4.72	2.87	2.76	10.35
172 ANN	3.73	2.77	2.16	8.66
86 TRI	4.04	2.71	2.17	8.93
172 TRI	3.79	2.78	2.30	8.87
344 SIX	3.91	3.03	2.36	9.30
688 SIX	4.21	2.98	2.68	9.87
1032 SIX	3.69	2.42	1.90	8.02
376 G(1)	3.64	2.17	2.02	7.83
376 S(1)	3.74	2.26	1.48	7.47
MEAN	3.98	2.62	2.13	8.72
MEAN DM%	14.0	18.2	23.6	18.6

PLOT AREA HARVESTED 0.00186

78/R/RN/7 SAWYERS I

SERIES III LEY

DRY MATTER TONNES/HECTARE

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

CUT 1 (1/9/78) CUT 2 (30/10/78) TOTAL OF 2 CUTS

P205			
NONE	0.68	0.45	1.14
29 ANN	2.03	0.54	2.57
57 ANN	2.25	0.52	2.76
115 ANN	2.43	0.47	2.91
172 ANN	2.91	0.58	3.49
86 TRI	2.22	0.37	2.59
172 TRI	2.54	0.52	3.06
344 SIX	1.83	0.49	2.32
688 SIX	2.43	0.41	2.84
1032 SIX	2.52	0.51	3.03
376 G(1)	0.81	0.49	1.31
376 S(1)	1.16	0.43	1.59
MEAN	1.98	0.48	2.47
MEAN DM%	17.9	29.1	23.5

PLOT AREA HARVESTED 0.00204

78/R/RN/7 SAWYERS I

WHEAT SERIES I 4TH CEREAL

GRAIN TONNES/HECTARE

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

P205	
NONE	2.90
29 ANN	4.02
57 ANN	4.07
115 ANN	4.08
172 ANN	4.28
86 TRI	3.98
172 TRI	4.43
344 SIX	4.39
688 SIX	5.03
1032 SIX	4.42
376 G(1)	3.28
376 S(1)	3.55

MEAN 4.04

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

TABLE	P205

SED	0.492

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

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.492	12.2

GRAIN MEAN DM% 84.0

STRAW TONNES/HECTARE

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

P205	
NONE	1.65
29 ANN	2.32
57 ANN	2.26
115 ANN	2.45
172 ANN	2.14
86 TRI	2.03
172 TRI	2.87
344 SIX	2.50
688 SIX	2.79
1032 SIX	2.55
376 G(1)	2.04
376 S(1)	1.97

MEAN 2.30

STRAW MEAN DM% 90.1

PLOT AREA HARVESTED 0.00562

78/R/RN/7 SAWYERS I

WHEAT SERIES II 5TH CEREAL

GRAIN TONNES/HECTARE

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

P205	
NONE	2.27
29 ANN	2.94
57 ANN	3.60
115 ANN	3.52
172 ANN	4.08
86 TRI	3.44
172 TRI	3.55
344 SIX	2.67
688 SIX	3.21
1032 SIX	3.38
376 G(1)	2.60
376 S(1)	2.46

MEAN	3.14
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***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
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SED	0.492

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

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.492	12.2

GRAIN MEAN DM% 84.5

STRAW TONNES/HECTARE

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

P205	
NONE	1.46
29 ANN	1.66
57 ANN	1.98
115 ANN	2.13
172 ANN	2.40
86 TRI	1.89
172 TRI	2.13
344 SIX	1.80
688 SIX	1.93
1032 SIX	2.36
376 G(1)	1.60
376 S(1)	1.66

MEAN	1.92
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STRAW MEAN DM% 90.2

PLOT AREA HARVESTED 0.00562