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Yields of the Field Experiments 1975

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75/ R/RN/7 - Residual Phosphate - Barley, Wheat, Ley

Rothamsted Research

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75/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 - Sawyers I and Great Field IV.

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

The sixteenth year, barley, wheat (Sawyers I), barley, ley (Great Field IV).

For previous years see 'Details' 1967, 68/B/5(t), 69/R/RN/7, 70/R/RN/7(t) and 71-74/R/RN/7.

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

Whole plot dimensions:

Gt. Field IV: 4.27 x 18.3

Sawyers I: 4.27 x 20.1.

Treatments: Rates and frequency of applying phosphate:-

	P2O5
None	0
Annual dressings, kg P2O5:	
29	29 ANN
57	57 ANN
115	115 ANN
172	172 ANN
Triennial dressings, kg P2O5 (last applied 1975):	
86	86 TRI
172	172 TRI
Six-yearly dressings, kg P2O5 (last applied 1973):	
344	344 SIX
688	688 SIX
1032	1032 SIX
Single dressing, kg P2O5 (applied autumn 1959):	
376 as Gafsa rock phosphate	376 G(1)
376 as granular superphosphate	376 S(1)

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- NOTES: (1) Since 1974 the original rotation of potatoes, barley, swedes on both fields has been changed. Blocks after barley are sown to 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:

Barley: Manures: (25:0:16) at 390 kg combine drilled. Weedkillers: Dicamba with mecoprop and MCPA (Sawyers I: 'Banlene Plus' at 5.6 l in 220 l, Great Field IV: 'Tetralix Plus' at 7.0 l in 220 l).

Wheat (Sawyers I only): Manures: K2O at 90 kg as muriate of potash. N at 130 kg as 'Nitro-Chalk'. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 220 l). Wheat after barley only: Ground chalk at 2.9 tonnes.

First year and reseeded ley (Gt. Field only): Manures: K2O at 120 kg as muriate of potash. N at 60 kg as 'Nitro-Chalk'.

First year ley only: Ground chalk at 2.9 tonnes.

Seed: Barley: Julia, dressed with ethirimol, sown at 160 kg.

Wheat: Cappelle, sown at 200 kg.

Grass clover mixture: 6.7 kg S215 Meadow Fescue, 4.5 kg Contessa Meadow Fescue, 4.5 kg S48 Timothy, 1.7 kg NZ Huia White Clover, 0.6 kg Wild White Clover. Sown at 24 kg.

Cultivations, etc.: (both fields for barley)

Barley: Ploughed: 29 Oct, 1974. Spring-tine cultivated and P applied: 26 Feb, 1975. Power harrowed and seed sown: 27 Feb. Weedkiller applied: 20 May. Combine harvested: 8 Aug.

Wheat: Chalk applied: 10 Oct, 1974. Ploughed: 28 Oct. P applied: 26 Nov. K applied, power harrowed and seed sown: 9 Dec. N applied: 23 Apr, 1975. Weedkiller applied: 19 May. Combine harvested: 13 Aug.

Leys: First year only: Chalk applied: 10 Oct, 1974. Ploughed: 29 Oct. Reseeded only. Ploughed: 24 Jan, 1975. All leys: Spring-tine cultivated, N and K applied: 5 May. P applied: 6 May. Power harrowed: 7 May. Seed sown: 9 May. Topped: 14 and 28 July, 19 Aug.

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BARLEY

TABLES OF MEANS

	GRAIN TONNES/HECTARE		STRAW TONNES/HECTARE	
	GREAT FIELD IV	SAWYERS I	GREAT FIELD IV	SAWYERS I
P205				
0	1.29	4.58	2.22	2.12
29 ANN	2.80	4.86	2.51	2.22
57 ANN	2.85	5.15	2.51	2.40
115 ANN	1.83	4.86	3.18	2.25
172 ANN	4.66	3.60	2.93	2.71
86 TRI	2.76	4.78	2.58	2.22
172 TRI	1.69	5.44	3.56	2.40
344 SIX	4.02	4.05	2.12	2.38
688 SIX	3.23	5.16	2.99	2.49
1032 SIX	3.81	4.94	2.63	2.10
376G(1)	3.99	4.32	2.14	2.05
376S(1)	3.06	4.26	2.04	1.90
MEAN	3.00	4.67	2.62	2.27

SAWYERS I ONLY GRAIN

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

TABLE	P205
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SED	0.729

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

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.729	15.6
GRAIN MEAN DM %	86.5	88.6	93.6
PLOT AREA HARVESTED	0.00520		94.6

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WHEAT SAWYERS I

TABLES OF MEANS

	GRAIN TONNES/HECTARE		STRAW TONNES/HECTARE	
	AFTER BARLEY	AFTER WHEAT	AFTER BARLEY	AFTER WHEAT
P205				
0	5.34	1.85	3.39	1.09
29 ANN	6.43	1.93	4.62	1.28
57 ANN	6.39	2.48	3.75	1.68
115 ANN	6.54	2.78	4.03	1.49
172 ANN	6.77	3.18	4.84	1.76
86 TRI	6.60	1.97	4.43	1.23
172 TRI	6.60	2.31	4.72	1.35
344 SIX	6.11	2.94	4.35	1.61
688 SIX	6.40	2.91	4.28	1.87
1032 SIX	6.78	3.59	5.18	2.39
376G(1)	5.88	1.59	3.92	1.09
376S(1)	6.10	2.11	3.77	1.13
MEAN	6.33	2.47	4.27	1.50

AFTER BARLEY

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

TABLE	P205
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SED	0.371

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

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.3709	5.9

AFTER WHEAT

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

TABLE	P205
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SED	0.609

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

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.609	24.6

GRAIN MEAN DM %	86.9	87.5	94.3	93.9
PLOT AREA HARVESTED	0.00572			