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# Yields of the Field Experiments 1984

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## 84/S/RN/2 Rotation II - W. Wheat, W. Beans

### Rothamsted Research

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84/S/RN/2

ROTATION II

Object: To measure, by crop yields and soil analysis, the residual value of P applied as FYM or superphosphate in the periods 1899-1964 and 1965-1967 and of fresh dressings since - Saxmundham.

Sponsor: A.E. Johnston.

The 15th year of revised scheme, w. wheat, w. beans.

For previous years see 'Details' 1967 and 1973, and 74-83/S/RN/2.

Whole plot dimensions: 5.49 x 39.8.

Treatments: From 1899-1964 the experiment tested farmyard manure and nitrogen and phosphate fertilizers applied to a rotation of crops. Since 1965 the treatments have been changed to evaluate old residues of P (from FYM and superphosphate) and new residues from treatments applied 1965-1967. All crops of the rotation - potatoes, s. barley, sugar beet, s. barley - were grown until 1974. The whole experiment was sown to s. barley in 1975 and 1976, alternating w. wheat and s. barley from 1977 to 1979, alternating w. beans and w. wheat in 1980 and 1981, w. wheat alone in 1982 and 1983, w. wheat and w. beans in 1984. Combinations of the following treatments were tested on w. beans and on a third wheat after beans in 1981:

Whole plots

1. RESIDUE

Residues of previous treatments:-

		Approximate total dressing 1899-1964	Total dressing 1965-1967
(O)0	Plot 1	None	None
(D)0	Plot 2	400 tonnes FYM	None
(DP)0	Plot 3	400 tonnes FYM, 2.7 tonnes P205	None
(DP)D2	Plot 4	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM
(DP)D2P1	Plot 5	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM, 0.56 tonnes P205
(DP)P1	Plot 6	400 tonnes FYM, 2.7 tonnes P205	0.56 tonnes P205
(DP)P2	Plot 7	400 tonnes FYM, 2.7 tonnes P205	1.13 tonnes P205
(DP52)0	Plot 8	326 tonnes FYM, 4.3 tonnes P205 (until 1952 only)	None

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Sub plots

2. P	Phosphate (total P <sub>2</sub> O <sub>5</sub> applied in each period (kg)):					
	1969-71	1973-75	1978*	1980*	1982*	1984*
(0)(0)0	0	0	0	0	0	0
(0)(3)0	0	378	0	0	0	0
(1)(3)1	126	378	120	120	120	120
(2)(3)1	252	378	120	120	120	120
(3)(3)0	378	378	0	0	0	0

\* 1978, 1980, 1982 and 1984 are the years of application for beans in 1984. Years of application for third wheat in 1984 were 1979, 1981 and 1983.

and, for wheat only, some of the combinations of 2 with:-

3. N	Nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk' in addition to 50 kg N at sowing:
80	
120	
160	
200	

NOTE: Plots with the combinations of RESIDUE (DP)D2, (DP)D2P1, (DP)P1, (DP)P2 with P(3)(3)(0) were used for N15 studies, yields not taken.

Standard applications:

Both crops: Manures: K<sub>2</sub>O at 150 kg as muriate of potash.  
 W. wheat: Weedkillers: Isoproturon at 2.5 kg with mecoprop, bromoxynil and ioxynil (as 'Brittox' at 3.5 l) applied with the permethrin in 220 l. Mecoprop, bromoxynil and ioxynil (as 'Brittox' at 2.1 l) in 220 l applied with the prochloraz. Fungicides: Prochloraz at 0.40 kg. Carbendazim at 0.15 kg, maneb at 1.6 kg and tridemorph at 0.37 kg plus captafol at 1.1 kg applied with the pirimicarb in 220 l. Insecticides: Permethrin at 0.06 kg. Pirimicarb at 0.14 kg.  
 W. beans: Weedkiller: Simazine at 1.1 kg in 220 l. Fungicide: Benomyl at 0.56 kg in 220 l.

Seed: W. wheat: Hustler, sown at 400 seeds per m<sup>2</sup>.  
 W. beans: Banner, sown at 250 kg.

Cultivations, etc.:-

Both crops: Muriate of potash applied: 18 Aug, 1983. Ploughed: 29 Aug.  
 W. wheat: Power harrowed, seed sown: 28 Sept. Isoproturon, 'Brittox' and permethrin applied: 19 Oct. N applied: 10 Apr, 1984. 'Brittox' with prochloraz applied: 17 Apr. Carbendazim, maneb, tridemorph, captafol and pirimicarb applied: 27 June. Combine harvested: 22 Aug.  
 W. beans: P applied: 18 Aug, 1983. Power harrowed, seed sown: 18 Oct. Weedkiller applied: 19 Oct. Fungicide applied: 17 Apr, 1984. Combine harvested, yields not recorded: 12 Oct.

84/S/RN/2

3RD W.WHEAT AFTER BEANS

GRAIN TONNES/HECTARE

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

RESIDUE	N P	80	120	160	200
(0)0	(0)(0)0	3.01	3.71		
(0)0	(0)(3)0			2.84	5.39
(0)0	(1)(3)1		7.36		8.66
(0)0	(2)(3)1	6.83		7.98	
(0)0	(3)(3)0	5.57		7.09	
(D)0	(0)(0)0			4.73	6.16
(D)0	(0)(3)0	6.11	6.30		
(D)0	(1)(3)1	7.17		8.36	
(D)0	(2)(3)1		7.98		9.50
(D)0	(3)(3)0		7.78		7.66
(DP)0	(0)(0)0	6.27	6.20		
(DP)0	(0)(3)0			7.71	7.62
(DP)0	(1)(3)1		7.83		8.92
(DP)0	(2)(3)1	7.23		8.39	
(DP)0	(3)(3)0	5.66		8.00	
(DP)D2	(0)(0)0			8.20	8.94
(DP)D2	(0)(3)0	6.14	7.90		
(DP)D2	(1)(3)1		7.67		9.09
(DP)D2	(2)(3)1	7.37		9.48	
(DP)D2P1	(0)(0)0	7.59	7.63		
(DP)D2P1	(0)(3)0			8.35	9.26
(DP)D2P1	(1)(3)1		8.22		9.88
(DP)D2P1	(2)(3)1	7.73		8.63	
(DP)P1	(0)(0)0	7.09	7.93		
(DP)P1	(0)(3)0			8.58	9.08
(DP)P1	(1)(3)1	6.68		9.54	
(DP)P1	(2)(3)1		8.06		9.67
(DP)P2	(0)(0)0			8.83	9.53
(DP)P2	(0)(3)0	6.83	8.00		
(DP)P2	(1)(3)1	7.04		9.20	
(DP)P2	(2)(3)1		8.70		9.50
(DP52)0	(0)(0)0			8.16	8.17
(DP52)0	(0)(3)0	5.63	7.09		
(DP52)0	(1)(3)1	6.17		8.18	
(DP52)0	(2)(3)1		7.38		8.77
(DP52)0	(3)(3)0		6.32		8.32

GRAIN MEAN DM% 85.1

PLOT AREA HARVESTED 0.00075