

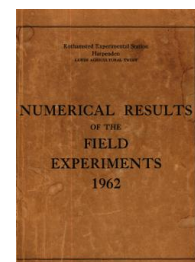
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# Yields of the Field Experiments 1962

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## 62/R/B/8 Residual Phosphate Rotation

### Rothamsted Research

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62/B/8.1

### RESIDUAL PHOSPHATE ROTATIONS

The long term and residual effects of a number of phosphate fertilisers compared with superphosphate - Great Field IV and Sawyers I 1962, the third year.

Rotation: Potatoes, barley, swedes.

Note: Swede tops are ploughed in.

Design: Great Field IV: 1 randomised block of 12 plots per crop.  
Sawyers I: 2 randomised blocks of 12 plots per crop.

Area of each plot (acres):

Great Field IV: 0.0193. Area harvested: Potatoes and barley - 0.0129, swedes - 0.0096.

Sawyers I: 0.0212. Area harvested: Potatoes and barley - 0.0141, swedes - 0.0106.

Treatments:

Granular superphosphate treatments broadcast in spring before sowing or ridging:-

1. No phosphate.
2. 0.25 cwt  $P_{205}$  per acre per year.
3. 0.50 cwt  $P_{205}$  per acre per year.
4. 0.75 cwt  $P_{205}$  per acre in 1962.
5. 1.50 cwt  $P_{205}$  per acre in 1962.

Phosphate fertilisers ploughed in at 3.0 cwt  $P_{205}$  per acre in September 1959.

6. Nitrophosphate I (17.1%  $P_{205}$ , none water soluble)
7. Nitrophosphate II (18.8%  $P_{205}$ , one quarter water soluble)
8. Nitrophosphate III (22.4%  $P_{205}$ , half water soluble)
9. Gafsa rock phosphate (28.9%  $P_{205}$ )
10. Bessemer basic slag (15.2%  $P_{205}$ )
11. Potassium metaphosphate\* (57.9%  $P_{205}$ , 38.8%  $K_2O$ )
12. Granular superphosphate (20.4%  $P_{205}$ )

\*Note: To balance the  $K_2O$  content of potassium metaphosphate, all the other treatments included 2.0 cwt  $K_2O$  per acre as sulphate of potash in autumn 1959.

Basal dressings per acre: Broadcast in spring before sowing or ridging:

N as 'Nitro-Chalk' 21:-

To potatoes: 1.2 cwt; to barley: 0.6 cwt; to swedes: 0.5 cwt.

$K_2O$  as sulphate of potash:-

To potatoes: 1.0 cwt; to barley: 1.0 cwt; to swedes: 1.0 cwt.

Cultivations, etc. (both fields, except as indicated):

Ploughed: Nov 16, 1961. Ground chalk applied at 20 cwt per acre: Feb 20.

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Potatoes: Fertilisers applied: Mar 26, 1962. Potatoes planted: Mar 27. Earthed up: July 6. Sprayed with maneb at  $1\frac{1}{2}$  lb in 18 gallons per acre: July 19. Sprayed with copper fungicide at 5 lb in 20 gallons per acre: Aug 10. Sprayed with indiluted BOV at 15 gallons per acre: Sept 25. Lifted: Sawyers I - Oct 5, Great Field IV - Oct 12. Variety: Majestic.

Barley: Fertilisers applied: Mar 8, 1962. Seed drilled at  $2\frac{1}{4}$  bushels per acre: Mar 15. Sawyers I sprayed with MCPA/TBA and Great Field IV with MCPA/MBA, each at 4 pints in 40 gallons per acre: May 30. Combine harvested: Aug 29. Variety: Proctor.

Swedes: P & K fertilisers applied: May 14, 1962. Seed hand drilled at  $2\frac{1}{2}$  lb per acre: May 23. 'Nitro-Chalk' applied: May 24. Singled: July 2. Lifted: Nov 8. Variety: Wilhelmsburger.

Standard errors per plot:

Sawyers I

Potatoes, Total tubers: 1.406 tons per acre or 12.7% (11 d.f.)  
 Barley, Grain (at 85% dry matter): 4.18 cwt per acre or 11.9% (11 d.f.)  
 Swedes, Roots: 1.489 tons per acre or 7.8% (11 d.f.)

Note (1). There were gaps in the swedes on some plots of both fields. It was decided that no adjustment should be made and the yields shown are as harvested.

Note (2). For details of the previous year's results see "Results of the Field Experiments" 60/B/9 and 61/B/8.

Summary of Results

Phosphate	<u>Potatoes</u>							
	Total tubers: tons per acre				Percentage ware ( $1\frac{1}{2}$ " riddle)			
	Great Field IV		Sawyers I		Great Field IV		Sawyers I	
	Mean	Increase	Mean	Increase	Mean	Increase	Mean	Increase
			(±0.995) (±1.406)					
None 1	10.70		8.35		96.8		93.8	
2	13.52	+2.82	11.41	+3.06	95.7	-1.1	94.5	+0.7
3	13.72	+3.02	11.32	+2.97	94.7	-2.1	95.2	+1.4
4	14.42	+3.72	11.74	+3.39	94.2	-2.6	94.6	+0.8
5	16.63	+5.93	12.10	+3.75	96.3	-0.5	93.3	-0.5
6	14.25	+3.55	9.94	+1.59	90.9	-5.9	93.0	-0.8
7	12.85	+2.15	12.31	+3.96	94.1	-2.7	96.0	+2.2
8	12.44	+1.74	12.01	+3.66	93.4	-3.4	93.8	0.0
9	11.95	+1.25	10.98	+2.63	94.8	-2.0	94.7	+0.9
10	12.62	+1.92	11.47	+3.12	93.7	-3.1	95.4	+1.6
11	13.74	+3.04	10.59	+2.24	92.7	-4.1	95.3	+1.5
12	13.06	+2.36	10.92	+2.57	95.7	-1.1	93.6	-0.2
Mean	13.33		11.09		94.4		94.4	

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Phosphate	Great Field IV		Sawyers I		Great Field IV		Sawyers I		
	Mean	Increase	Mean	Increase	Mean	Increase	Mean	Increase	
<u>Barley</u>									
<u>Grain (at 85% dry matter):</u>					<u>Straw (at 85% dry matter):</u>				
<u>cwt per acre</u>					<u>cwt per acre</u>				
(±2.95) (±4.18)									
None	1	35.6		34.0	32.6		20.5		
	2	39.5	+3.9	31.8	-2.2	35.2	+2.6	16.6	-3.9
	3	34.7	-0.9	34.4	+0.4	38.3	+5.7	22.1	+1.6
	4	35.9	+0.3	34.7	+0.7	36.7	+4.1	21.0	+0.5
	5	40.3	+4.7	38.1	+4.1	41.8	+9.2	26.3	+5.8
	6	39.8	+4.2	31.4	-2.6	32.9	+0.3	16.5	-4.0
	7	39.3	+3.7	36.1	+2.1	35.7	+3.1	22.1	+1.6
	8	34.8	-0.8	30.4	-3.6	32.1	-0.5	16.8	-3.7
	9	41.7	+6.1	35.6	+1.6	34.4	+1.8	19.7	-0.8
	10	38.2	+2.6	39.2	+5.2	32.0	-0.6	23.7	+3.2
	11	38.2	+2.6	36.9	+2.9	33.8	+1.2	20.2	-0.3
	12	38.6	+3.0	36.9	+2.9	33.1	+0.5	23.1	+2.6
Mean		38.1		34.9		34.9		20.7	
Mean dry matter									
% as harvested:		82.9		83.2		48.6		65.4	

Swedes, Roots: tons per acre

(±1.053) (±1.489)					
None	1	3.89		5.00	
	2	18.95	+15.06	17.97	+12.97
	3	25.35	+21.46	19.15	+14.15
	4	23.28	+19.39	19.96	+14.96
	5	24.63	+20.74	20.75	+15.75
	6	23.09	+19.20	25.91	+20.91
	7	24.02	+20.13	18.52	+13.52
	8	19.87	+15.98	23.38	+18.38
	9	26.58	+22.69	19.04	+14.04
	10	23.90	+20.01	19.37	+14.37
	11	22.53	+18.64	20.81	+15.81
	12	24.23	+20.34	20.62	+15.62
Mean		21.69		19.20	