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Yields of the Field Experiments 1955

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55/R/BA/2 Four-course Rotation

Rothamsted Research

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55/Ba/2.1

FOUR COURSE ROTATION EXPERIMENT

1st year of revised scheme

The experiment in its original form ended at the harvest of 1954. A summary of the results and details of the original scheme appear in the Station annual report for 1954 (p.153).

The cropping rotation has been modified by introducing beans (autumn sown when possible) instead of ryegrass ley, the present rotation being: potatoes, barley, beans, wheat.

The applications of dung, straw, straw compost and rock phosphate have been discontinued. The plots of the original dung, straw and superphosphate series now receive an annual dressing of 0.24 cwt P_2O_5 per acre applied as superphosphate, while the old compost plots receive 0.12 cwt P_2O_5 annually as superphosphate. The rock phosphate plots receive no phosphate. All plots receive a basal dressing of 0.6 cwt K_2O annually as muriate of potash (but see below for the beans of 1955 and the wheat of 1956).

Each plot of wheat, barley and potatoes is split into 2 for the application of nitrogen:-

wheat and barley:	none; 0.4 cwt N per acre applied as sulphate of ammonia.
potatoes:	0.2; 0.6 cwt N per acre applied as sulphate of ammonia

The arrangement of the levels of nitrogen is randomized afresh each season. The beans do not receive nitrogen.

The phosphate and potash fertilizers are applied in autumn for beans and wheat, half-plots of wheat receiving a single top dressing of nitrogen in spring. All fertilizers for barley are applied to the seedbed. All fertilizers for potatoes are broadcast on the flat before planting, which is by machine.

In 1955 the plots of beans were split into 3 for the application of potash:-

none; 0.8; 1.6 cwt K_2O per acre applied as muriate of potash.

The wheat following these beans will receive equalizing amounts of potash:- 1.6 cwt K_2O following none; 0.8 following 0.8 and none following 1.6. It is not intended to repeat this test.

55/Ba/2.2

Area of each sub plot: Potatoes, wheat: 0.0129 acre. Barley: 0.0120
acre. Beans: 0.0081 acre.

Area harvested: Potatoes: 0.0106 acre. Wheat: 0.0057 acre.
Barley: 0.0052 acre. Beans: 0.0038 acre.

Cultivations, etc.:

Potatoes.

Ploughed: Sept 22, 1954. Fertilizers applied broadcast on flat:
May 3, 1955. Machine planted: May 4. Earthed up: July 6.
Sprayed with sulphuric acid, 20% B.O.V.: Oct 4. Lifted: Oct 10.
Variety: Majestic.

Barley.

Ploughed: Oct 12, 1954. Seed drilled at 3 bushels per acre:
Mar 22, 1955. Fertilizers applied: Mar 31. Sprayed with M.C.P.A.,
medium volume, $2\frac{1}{2}$ pints per acre: June 8. Combine harvested:
Aug 19. Variety: Plumage Archer.

Beans.

Ploughed: Sept 8, 1954. Potash dressings applied: Oct 26.
Phosphate dressings applied: Mar 18, 1955. Seed drilled at 200 lb.
per acre: Mar 21. Harvested: Aug 22. Variety: Gartons Spring Tick.

Wheat.

Ploughed: July 23 and again Aug 26, 1954. Seed sown at $2\frac{3}{4}$ bushels
per acre: Oct 22. Basal potash fertilizer applied: Oct 26.
Nitrogen and phosphate fertilizer treatments applied: May 11, 1955.
Sprayed with M.C.P.A., medium volume, $2\frac{1}{2}$ pints per acre: May 31.
Combine harvested: Aug 24. Variety: Yeoman.

55/Ba/2.3

Summary of Results

Previous Treatment	Year applied	P2O5: cwt per acre applied 1955	Potatoes			Percentage Ware			Barley (at 85% Dry matter): cwt per acre			
			Total tubers: tons per acre	N: per acre	Diff.	N: per acre	Mean	Diff.	N: per acre	Mean	Diff.	
Manure	1954		4.28	5.03	4.66	+0.75	82.1	82.1	27.2	34.0	30.6	+6.8
	1953		4.28	4.91	4.60	+0.63	81.6	80.8	19.4	33.8	26.6	+14.4
	1952	0.24	5.08	6.71	5.90	+1.63	81.6	85.6	18.5	28.9	23.7	+10.4
	1951		3.69	4.70	4.20	+1.01	81.8	82.0	25.7	26.9	26.3	+1.2
	1950		5.24	5.33	5.28	+0.09	82.0	82.9	18.4	25.0	21.7	+6.6
Adco (straw compost)	1954		4.41	4.83	4.62	+0.42	84.1	83.8	28.9	25.9	27.4	-3.0
	1953		4.66	4.70	4.68	+0.04	87.1	84.8	17.9	21.1	19.5	+3.2
	1952	0.12	3.52	4.74	4.13	+1.22	84.3	85.3	11.4	20.6	16.0	+9.2
	1951		4.66	4.62	4.64	-0.04	81.9	82.6	10.0	16.8	13.4	+6.8
	1950		3.99	4.03	4.01	+0.04	84.6	86.0	22.6	23.1	22.8	+0.5
Straw	1954		4.78	5.20	4.99	+0.42	82.0	83.9	22.4	34.9	28.6	+12.5
	1953		4.78	5.33	5.06	+0.55	83.0	84.6	23.5	23.3	23.4	-0.2
	1952	0.24	5.12	5.75	5.44	+0.63	85.9	85.4	23.0	26.7	24.8	+3.7
	1951		3.73	5.12	4.42	+1.39	78.9	79.6	18.5	33.7	26.1	+15.2
	1950		4.95	5.24	5.10	+0.29	87.7	86.0	23.1	35.4	29.2	+12.3
Super-phosphate	1954		4.28	4.91	4.60	+0.63	83.3	84.6	26.5	24.7	25.6	-1.8
	1953		4.99	6.04	5.52	+1.05	80.9	87.7	17.3	27.6	22.4	+10.3
	1952	0.24	4.70	4.78	4.74	+0.08	81.0	81.6	23.6	35.2	29.4	+11.6
	1951		3.78	4.41	4.10	+0.63	79.5	81.7	15.0	23.6	19.3	+8.6
	1950		4.49	5.20	4.84	+0.71	85.0	84.4	13.1	23.0	18.0	+9.9
Rock phosphate	1954		4.03	4.74	4.38	+0.71	80.5	87.6	11.6	16.0	13.8	+4.4
	1953		3.52	4.57	4.04	+1.05	85.4	86.0	18.9	21.3	20.1	+2.4
	1952	None	3.57	4.15	3.86	+0.58	76.5	80.6	19.9	23.5	21.7	+3.6
	1951		3.52	4.45	3.98	+0.93	83.4	85.3	10.9	13.8	12.4	+2.9
	1950		4.49	4.45	4.47	-0.04	86.7	86.0	13.6	19.6	16.6	+6.0

Mean dry matter % as harvested:

55/Ba/2.4

Previous Treatment	Year applied	P ₂ O ₅ : cwt per acre applied 1955	Beans (at 85% dry matter):			Wheat			
			Grain (at 85% dry matter): K ₂ O: cwt per acre	N: per acre	Mean	Grain: cwt per acre	Mean	Diff.	
Manure			0.8	1.6	0.4	0.4			
Dung	1954		11.4	17.1	13.4	13.8	24.7	19.2	+10.9
	1953		15.5	13.8	14.8	9.4	17.2	13.3	+7.8
	1952	0.24	14.3	20.2	16.9	12.8	23.2	18.0	+10.4
	1951		14.8	12.1	13.0	9.7	20.4	15.0	+10.7
	1950		17.9	14.5	17.4	10.7	18.5	14.6	+7.8
Adco (straw compost)	1954		18.1	15.0	16.0	12.2	21.6	16.9	+9.4
	1953		16.7	12.6	14.1	11.7	19.1	15.4	+7.4
	1952	0.12	11.4	11.2	12.6	11.3	19.6	15.4	+8.3
	1951		18.1	14.3	16.4	9.1	16.0	12.6	+6.9
	1950		12.4	9.3	12.5	11.7	20.1	15.9	+8.4
Straw	1954		16.4	15.0	16.7	13.3	19.6	16.4	+6.3
	1953		16.4	15.7	15.1	11.0	20.1	15.6	+9.1
	1952	0.24	17.1	16.7	16.6	14.1	16.0	15.0	+1.9
	1951		13.8	10.5	12.1	11.0	20.4	15.7	+9.4
	1950		12.6	15.2	13.8	11.3	23.5	17.4	+12.2
Super-phosphate	1954		15.0	14.8	13.7	8.6	16.4	12.5	+7.8
	1953		15.0	13.3	11.7	9.4	18.5	14.0	+9.1
	1952	0.24	19.8	15.5	17.6	11.0	16.4	13.7	+5.4
	1951		10.7	12.9	12.3	9.1	16.9	13.0	+7.8
	1950		11.2	9.8	12.8	8.6	16.9	12.8	+8.3
Rock phosphate	1954		12.6	13.1	13.6	8.6	18.5	13.6	+9.9
	1953		12.6	11.4	12.1	11.7	17.2	14.4	+5.5
	1952	None	12.4	10.0	11.2	8.1	16.0	12.0	+7.9
	1951		12.1	13.3	12.2	10.7	17.2	14.0	+6.5
	1950		10.2	11.4	10.5	7.5	13.3	10.4	+5.8
Mean dry matter % as harvested:								84.9	
									87.0