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48/BA/4 Six-course Rotation - Rothamsted and Woburn

Rothamsted Research

Rothamsted Research (1949) *48/BA/4 Six-course Rotation - Rothamsted and Woburn* ; Yields Of The Field Experiments 1948, pp 24 - 28

48/Ba/4.1

SIX COURSE ROTATION EXPERIMENT

1947-8

Seasonal effects of N, P₂O₅ and K₂O

Rotation and treatments as given in 1932 Report, p. 131, with the exceptions that since 1934 the forage crop has been replaced by rye, harvested as a mature crop, and that the green manure crops are now omitted. Since 1934 lime has been applied at the rate of 10 cwt. per acre at two stages in the rotation: immediately after the removal of the potato crop and before sowing barley.

Cultivations, etc.:

Rothamsted, Long Hoos IV

Sugar beet. Series 3.

Ploughed: Sept 11, 12. Harrowed: Mar 22. Ploughed, harrowed and ring rolled: Apr 15, 16. Artificials applied, seed drilled and harrowed in: Apr 16. Ring rolled: Apr 22. Applied Agroxide ($\frac{1}{2}$ cwt. per acre) against wireworm: Apr 29. Dusted with Flea beetle dust: May 8, 14, 15. Applied Agroxide ($1\frac{1}{2}$ cwt. per acre): May 10. Hoed: June 8 - July 22. Singled: June 9. Lifted: Nov 10. Variety: Klein E. Previous crop: Rye.

Barley. Series 4.

Sugar beet tops remaining from 1947 crop ploughed in: Nov 7. Ground chalk applied (22 cwt. per acre); Nov 14. Springtine harrowed: Mar 1. Artificials applied: Mar 4. Harrowed, seed drilled and harrowed in: Mar 5. Ring rolled: Mar 9. Clover seed undersown: Apr 15. Harrowed and ring rolled: Apr 16. Harvested: Aug 18. Variety: Plumage Archer. Previous crop: Sugar beet.

Clover. Series 1.

Seed undersown in barley, harrowed in: Apr 12. Ring rolled: Apr 14. Phosphate and potash fertilizer applied: Dec 10. Rolled: Mar 10. Sulphate of ammonia applied: Mar. 16. Self sown barley cut: Apr 26. Cut: July 6. Variety: Late flowering Montgomery Red. Previous crop: Barley.

Wheat. Series 5.

Ploughed: June 30. Twice harrowed: Oct 1. Autumn artificials applied, seed drilled and harrowed in: Oct 2. Seed resown (owing to plant failure) and harrowed in: Nov 12. Rolled: Mar 16. Sulphate of ammonia applied: Apr 15. Harvested: Aug 18. Variety: Yeoman. Previous crop: Clover.

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Potatoes. Series 6.

Ploughed: Sept. 9, 10. Harrowed: Mar. 10. Ploughed and harrowed: Mar. 10, 11. Harrowed and rolled: Mar. 22. Ridged: Mar. 23. Artificials applied, potatoes planted and covered in: Mar. 24. Ridges rolled down: Mar. 27. Harrowed: Mar. 30. Hoed: June 4-10. Grubbed: June 7, 18. Earthed up: June 19. Sprayed with "Perinox": Aug. 9. Sprayed to kill haulm: Sept. 13. Lifted: Sept. 29. Variety: Majestic. Previous crop: Wheat.

Rye. Series 2.

Ploughed: Sept. 30 - Oct. 1. Harrowed twice, ring rolled, harrowed: Oct. 1. Autumn artificials applied, seed drilled and harrowed in: Oct. 3. Ground chalk (22 cwt. per acre) applied: Nov. 14. Ring rolled: Mar. 31. Sulphate of ammonia applied: Apr. 16. Cut: July 30. Previous crop: Potatoes.

Woburn, Stackyard Field, Series B.

Sugar beet. Series 4.

Ploughed: Sept. 16, Oct. 1, Feb. 25-28. Springtime harrowed: Mar. 17. Harrowed: Mar. 19. Rolled: Mar. 27. Seed drilled: Apr. 2. Artificials applied and harrowed in: Apr. 5. Rolled: Apr. 6. Hoed: May 19. Singled, and weeded to clear thistles, hoed: May 25 - June 1. Hoed: June 5 - July 21. Lifted: Oct. 4. Variety: Klein E. Previous crop: Rye.

Barley. Series 6.

Sugar beet tops from 1947 crop ploughed in: Oct. 29-30. Ground chalk applied (96.5% CaCO₃, at rate of 1½ tons per acre of CaCO₃). Springtime harrowed: Mar. 1. Artificials applied, harrowed: Mar. 4. Seed drilled and harrowed in: Mar. 10. Rolled, Clover seed undersown: Mar. 12. Harrowed: Mar. 13. Harvested: Aug. 14. Variety: Plumage Archer. Previous crop: Sugar beet.

Clover. Series 3.

Clover seed (late flowering Montgomery Red) undersown in barley, Apr. 17, 1947. Failed owing to drought. Ploughed: Sept. 26, 27, Feb. 26-28. Harrowed, all artificials including sulphate of ammonia applied: Mar. 4. Rolled, seed sown by hand and harrowed in: May 12. Harrowed and rolled: Mar. 13. Cut: July 1. Variety: Early red Trifolium. Previous crop: Barley.

48/Ba/4.3

Wheat. Series 1.

Ploughed: July 9. Cultivated: Aug. 21, Sept. 1. Rolled three times, cultivated three times, harrowed: Oct. 9. Autumn artificials applied: Oct. 14. Seed drilled and harrowed in: Oct. 14-15. Sowing destroyed by birds. Harrowed, seed drilled and harrowed in: Nov. 14. Harrowed: Apr. 14. Sulphate of ammonia applied: Apr. 22. Rolled: Apr. 26. Harvested: Aug. 28. Variety: Squareheads Master (13/4). Previous crop: Clover.

Potatoes. Series 2.

Ploughed: Sept. 30, Oct. 6, Feb. 27-28. Springtine harrowed: Mar. 17. Harrowed: Mar. 19. Rolled: Mar. 27. Ridged: Apr. 6-7. Artificials applied, potatoes planted and covered in: Apr. 9. Ridges harrowed down: May 8. Grubbed: May 28. June 8. Hoed, earthed up: June 21. Sprayed with "Perinox": Early Aug. Sprayed to kill haulm: Sept. 22. Lifted: Sept. 30. Variety: Majestic. Previous crop: Wheat.

Rye. Series 5.

Ploughed: Oct. 6, 7. Harrowed: Oct. 9. Ground chalk spread (14 cwt. per acre): Oct. 13. Autumn artificials applied: Nov. 14. Seed drilled and harrowed in: Nov. 15. Harrowed: Apr. 14. Sulphate of ammonia applied: Apr. 22. Cut: July 30. Previous crop: Potatoes.

48/Ba/4.4

Mean yields per acre and increments in yield per cwt. of N, P₂O₅ and K₂O

	Rothamsted		Woburn		Rothamsted		Woburn		
	Response	S.E.	Response	S.E.	Response	S.E.	Response	S.E.	
Sugar Beet: Roots (washed) tons/acre					Clover Hay: Dry Matter cwt/acre				
Yield	11.51		8.52		36.3		32.6		
N	0.84	1.263	<u>9.11</u>	1.237	-1.2	5.15	-1.3	6.54	
P	-1.23	1.263	<u>-0.85</u>	1.237	-8.1	5.15	-1.9	6.54	
K	0.19	0.758	-1.35	0.742	6.3	3.09	1.1	3.92	
Tops: tons/acre					Wheat grain: cwt/acre				
Yield	10.72		6.92		26.6		20.8		
N	3.45	2.191	<u>13.31</u>	1.510	7.5	2.15	<u>23.1</u>	5.79	
P	-3.17	2.191	<u>-2.02</u>	1.510	-0.3	2.15	<u>-13.2</u>	5.79	
K	0.70	1.315	<u>-2.28</u>	0.906	3.3	1.29	<u>-11.8</u>	3.47	
Sugar Percentage					Wheat straw: cwt/acre				
Yield	17.87		17.57		47.8		40.2		
N	0.09	0.696	0.76	0.727	18.5		36.9		
P	-0.43	0.696	0.47	0.727	-1.5		-13.3		
K	-0.39	0.418	0.56	0.436	7.4		-19.9		
Total Sugar: cwt/acre					Potatoes: total tubers tons/acre				
Yield	41.2		30.0		9.52		8.94		
N	3.1	4.38	<u>32.9</u>	4.02	6.09	1.541	7.62	1.326	
P	-5.5	4.38	<u>-2.1</u>	4.02	-1.08	1.541	<u>0.55</u>	1.326	
K	-0.3	2.63	<u>-3.8</u>	2.41	<u>2.41</u>	0.924	-0.57	0.795	
Plant Number: thous/acre					Potatoes: Percentage Ware				
Yield	20.9				97.1		93.2		
N	-1.3	2.77			1.7	1.36	-0.7	2.30	
P	2.9	2.77			-2.5	1.36	-4.8	2.30	
K	0.8	1.66			1.8	0.82	<u>-3.5</u>	1.38	

Note: The underlined values are significant at 5% level.

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	Rothamsted Response S.E.	Woburn Response S.E.	Rothamsted Response S.E.	Woburn Response S.E.
Barley Grain: cwt/acre			Rye Grain: cwt/acre	
Yield	<u>36.2</u>	<u>27.5</u>	<u>25.8</u>	<u>21.2</u>
N	<u>10.7</u> 3.71	<u>17.6</u> 5.33	<u>18.4</u> 3.50	<u>15.0</u> 4.39
P	<u>-2.3</u> 3.71	<u>3.5</u> 5.33	<u>2.6</u> 3.50	<u>-5.3</u> 4.39
K	<u>-1.2</u> 2.23	<u>1.7</u> 3.20	<u>2.3</u> 2.10	<u>7.8</u> 2.64
Barley Straw: cwt/acre			Rye Straw: cwt/acre	
Yield	<u>39.6</u>	<u>26.4</u>	<u>47.3</u>	<u>42.8</u>
N	<u>24.7</u>	<u>20.9</u>	<u>14.7</u>	<u>4.5</u>
P	<u>-1.6</u>	<u>-6.5</u>	<u>0.7</u>	<u>-3.8</u>
K	<u>-3.7</u>	<u>3.7</u>	<u>4.6</u>	<u>10.6</u>

Note: The underlined values are significant at 5% level.