ROTHAMSTED RESEARCH

Yields of the Field Experiments 1958

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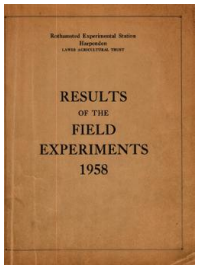

58/R/A/6 Hoosfield Exhaustion Land - Barley and Multiple Crops

Rothamsted Research

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BARLEY 1958 AND MULTIPLE CROPPING x PK 1957 and 1958 - HOOSFIELD EXHAUSTION LAND

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

On the western halves - plots 2, 4, 6, 8, 10 - the land fallowed in 1957 was sown to barley in 1958, the remaining 90 links, cropped in 1957, was bare fallowed in 1958.

In 1957, on the eastern half of the field, a modified scheme of cropping was introduced to evaluate manurial residues under 6 different crops in 1957 and again on fresh land in 1958.

The original strips 1, 3, 5, 7, 9 were divided into 12 cross strips of 5 main plots, each main plot being divided into 4 sub plots. In 1957 alternate cross strips were cropped, the remaining cross strips being fallowed, serving as headlands. These uncropped headlands carried the test crops in 1958.

Area of each sub plot:
1957: 0.0035 acres.
1958: 0.0032 acres.

Treatments.
Crops: Potatoes, sugar beet, kale, spring wheat, barley, swedes.
Fertilizer treatments to plots, combinations of:-
Superphosphate: None; 0.25 (P_1); 0.5 (P_2); 1.0 (P_4) cwt P_2O_5 per acre, for all crops.
Sulphate of potash: None; 0.15 (K_1); 0.3 (K_2); 0.6 (K_4) cwt K_2O per acre, for wheat, barley and swedes.
Sulphate of potash: None; 0.3 (K_2); 0.6 (K_4); 1.2 (K_8) cwt K_2O per acre for potatoes, sugar beet and kale.
The above combinations of treatments vary according to the original manurial treatments on wheat and potatoes.

Basal dressing:
Rates of N per acre, as sulphate of ammonia:

Potatoes	1.0	
Sugar beet	1.0	
Kale	0.6	in seedbed, followed later by two top-dressings each of 0.6 as 'Nitro-Chalk'.
Spring wheat	0.6	
Barley	0.5	
Swedes	0.6	in 1957
	0.4	in 1958

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Cultivations, etc.:

Western half 1958.

Cropped section. Barley. Ploughed: Dec 31, 1957. Seed drilled at 2¾ bushels per acre: Apr 12, 1958. Sulphate of ammonia applied at 2½ cwt per acre: Apr 17. Sprayed with CMPP at 6 pints in 40 gallons per acre: May 28. Combine harvested: Sept 7. Variety: Plumage Archer.

Fallow section. Ploughed: Dec 31, 1957 and June 16, 1958.

Eastern half.

1957. Ploughed: Sept 26, 1956.

Potatoes: Fertilizers applied, potatoes hand planted: Apr 29, 1957. Earthed up: July 6. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 3 and Aug 21. Harvested: Sept 30. Variety: Majestic.

Sugar beet: Fertilizers applied: Apr 4. Seed drilled at 12 lb per acre: Apr 15. Sprayed with miscible DDT at 3 pints in 20 gallons per acre: May 29. Singled: June 19. Sprayed with demeton methyl at 12 fluid oz in 80 gallons per acre: July 9. Harvested: Nov 7. Variety: Klein E.

Kale: Seedbed N and PK applied: Apr 4. Seed drilled at 6 lb per acre: Apr 27. Thinned: June 28. Nitrogen top-dressings applied: July 2 and Sept 13. Harvested: Dec 2. Variety: Thousand Head.

Spring wheat: Fertilizers applied: Mar 19. Seed drilled at 3½ bushels per acre: Mar 21. Harvested: Aug 19. Variety: Koga II.

Barley: Fertilizers applied: Mar 18. Seed drilled at 2¾ bushels per acre: Mar 21. Harvested: Aug 1. Variety: Plumage Archer.

Swedes: Fertilizers applied: Apr 17. Seed drilled at 6 lb per acre: Apr 27. Singled: June 21. Harvested: Nov 15. Variety: Wilhelmsburger.

1958. Ploughed: Dec 31, 1957. All varieties as in 1957.

Potatoes: Fertilizers applied: Apr 23, 1958. Potatoes hand planted: Apr 25. Earthed up: July 8. Sprayed 3 times with copper fungicide, 5 lb in 40 gallons per acre: July 12, and 3 lb and 1 pint spreader in 40 gallons per acre: Aug 6 and 16. Harvested: Sept 9.

Sugar beet: Fertilizers applied, seed drilled at 19 lb per acre: Apr 14. Singled: June 6. Sprayed with demeton methyl at 12 fluid oz in 40 gallons per acre: July 7. Harvested: Nov 18.

Kale: Seedbed N and PK applied: Apr 14. Seed drilled at 3 lb per acre: Apr 15. Thinned: June 10. Nitrogen top dressings applied: July 5 and Aug 27. Harvested: Dec 3.

Spring wheat: Fertilizers applied: Apr 11. Seed drilled at 3¼ bushels per acre: Apr 12. Harvested: Sept 1.

Barley: Fertilizers applied: Apr 11. Seed drilled at 2¾ bushels per acre: Apr 12. Harvested: Aug 13.

Swedes: Fertilizers applied, seed drilled at 5 lb per acre: May 15. Singled: June 10. Harvested: Oct 5.

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Summary of Results

Barley

Manuring to potatoes 1876-1901*	Yield (at 85% dry matter): cwt per acre Grain	Straw
2 Unmanured after dung 1876-81	10.4	12.3
4 Dung	27.1	24.1
6 Nitrate of soda	11.5	12.8
8 Nitrate of soda and complete minerals	22.4	21.8
10 Complete minerals	23.6	26.2
Mean dry matter % as threshed	74.6	80.7

*For certain changes see history.

Strip	Treatment 1957	Potatoes Total tubers: tons per acre	Sugar beet Roots (washed): tons/acre	Sugar beet Total Sugar: cwt/acre	Sugar beet Tops: tons/acre	Kale Total yield: tons per acre
1	P_1 -	4.7	8.3	25.9	14.5	17.3
	P_1K_2	7.9	6.8	20.8	12.4	16.5
	P_1K_4	11.5	9.9	30.7	16.3	19.8
	P_1K_8	10.9	8.3	26.3	12.4	17.4
3	P_1 -	9.9	9.0	28.7	12.0	17.1
	P_1K_4	12.8	11.0	34.2	14.5	18.2
	P_1K_8	14.1	11.1	36.6	13.8	18.3
	$-K_8$	8.8	9.4	29.7	11.2	15.9
5	$-K_8$	5.0	6.1	18.3	10.0	13.2
	P_1K_8	11.4	8.6	27.6	12.0	15.8
	P_2K_8	11.8	9.1	28.7	12.6	17.4
	P_4K_8	12.7	9.6	29.4	14.9	19.2
7	P_1 -	10.0	9.5	31.2	12.6	18.0
	P_1K_2	11.4	9.6	30.5	11.4	18.4
	P_1K_4	14.0	9.8	30.6	12.8	18.4
	P_1K_8	14.1	9.0	27.9	11.0	20.9
9	$-K_8$	9.3	9.0	29.6	9.6	15.2
	P_1K_8	9.6	11.0	36.0	11.8	16.5
	P_2K_8	11.4	9.1	29.0	10.6	17.6
	P_4K_8	12.9	9.9	32.5	12.0	17.7

Strip	Treatment 1957	Barley Grain cwt per acre	Barley Straw cwt per acre*	Wheat Grain cwt per acre	Wheat Straw cwt per acre*	Swedes Roots tons per acre	Swedes Tops tons per acre
1	P_1 -	26.7	22.4	25.6	36.0	10.7	2.6
	P_1K_1	22.7	19.6	21.4	32.4	11.9	2.5
	P_1K_2	22.2	21.3	28.8	43.8	11.8	2.2
	P_1K_4	30.2	27.0	23.6	33.7	11.5	2.4
3	$-K_4$	29.1	23.7	24.1	30.5	11.1	2.1
	P_2K_4	28.3	26.1	25.2	35.3	12.1	2.2
	P_1K_4	28.9	23.2	24.6	34.0	14.0	2.7
	P_4 -	27.7	22.2	23.9	30.7	13.2	2.5
5	$-K_4$	20.4	19.7	19.3	23.0	6.9	1.0
	P_1K_4	22.1	19.7	20.3	26.3	8.4	1.4
	P_2K_4	22.8	22.4	21.2	29.6	11.1	1.8
	P_4K_4	26.2	21.1	23.2	33.0	12.2	1.8
7	P_1 -	29.3	25.0	22.5	31.2	12.4	2.3
	P_1K_1	27.5	22.9	24.4	32.9	12.7	2.2
	P_1K_2	28.9	25.3	24.7	35.2	12.9	2.5
	P_1K_4	28.4	23.1	20.5	28.8	12.9	2.2
9	$-K_4$	27.2	23.0	21.2	27.3	10.4	1.8
	P_1K_4	25.1	22.0	24.1	32.4	11.6	2.0
	P_2K_4	26.4	25.0	23.8	31.9	11.8	2.2
	P_4K_4	26.0	22.9	22.6	30.8	12.2	2.0
Mean D.M. %		82.4	71.8	81.0	81.0		

*At 85% dry matter

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Strip	Treatment 1958	Potatoes Total tubers: tons per acre	Sugar beet Roots (washed): tons/acre	Sugar beet Total Sugar: cwt/acre	Sugar beet Tops: tons/acre	Kale Total yield: tons per acre
1	P_4 -	8.8	16.4	51.8	16.2	23.1
	P_4K_2	9.7	18.2	58.6	14.8	21.1
	P_4K_4	12.1	19.7	63.2	14.6	22.6
	P_4K_8	13.9	20.3	64.2	14.8	19.1
3	P_4 -	11.0	19.8	64.6	16.1	22.4
	P_4K_4	13.7	21.3	68.9	15.9	25.7
	P_4K_8	14.4	22.5	72.1	15.9	28.0
	$-K_8$	10.8	18.8	60.8	13.7	22.4
5	$-K_8$	5.2	13.5	42.8	14.2	16.3
	P_1K_8	11.6	18.2	57.5	15.6	22.7
	P_2K_8	13.6	18.8	61.4	15.3	22.8
	P_4K_8	13.3	19.0	61.8	15.4	21.0
7	P_4 -	12.1	20.2	66.7	12.7	24.2
	P_4K_2	13.8	19.3	62.8	14.0	23.3
	P_4K_4	14.9	19.9	65.2	13.1	23.0
	P_4K_8	15.2	17.9	58.7	12.8	24.6
9	$-K_8$	7.4	18.4	60.8	12.2	23.1
	P_1K_8	11.0	17.1	56.0	12.0	23.5
	P_2K_8	11.0	17.2	55.5	10.6	24.9
	P_4K_8	13.2	19.9	63.1	13.2	25.2

Strip	Treatment 1958	Barley Grain cwt per acre	Barley Straw cwt per acre*	Wheat Grain cwt per acre	Wheat Straw cwt per acre*	Swedes Roots tons per acre	Swedes Tops tons per acre
1	P_4 -	26.4	37.5	27.1	43.6	19.4	3.8
	P_4K_1	26.8	40.2	26.7	44.3	21.9	4.3
	P_4K_2	26.5	38.6	26.8	46.1	20.9	4.4
	P_4K_4	26.5	39.8	27.8	50.9	20.6	4.1
3	$-K_4$	23.1	37.2	28.2	49.6	23.2	4.2
	P_2K_4	29.7	37.5	29.1	55.0	22.7	4.5
	P_4K_4	32.6	42.0	31.9	55.8	25.6	4.3
	P_4 -	29.5	39.9	29.3	54.5	24.8	5.0
5	$-K_4$	12.1	26.6	18.7	28.4	10.1	2.5
	P_1K_4	20.2	33.5	24.2	41.6	19.8	4.5
	P_2K_4	24.6	37.2	27.4	48.6	20.8	4.8
	P_4K_4	29.4	39.6	29.1	51.2	23.4	4.7
7	P_4 -	27.0	39.5	25.0	45.0	24.9	4.0
	P_4K_1	26.3	42.7	25.9	49.3	25.3	4.4
	P_4K_2	28.6	39.2	27.2	49.4	24.8	4.3
	P_4K_4	28.3	41.3	27.0	50.1	25.0	4.2
9	$-K_4$	24.0	38.4	23.7	46.6	20.6	4.0
	P_1K_4	25.8	38.1	24.5	42.4	21.5	3.3
	P_2K_4	27.5	39.3	24.7	45.7	20.5	4.2
	P_4K_4	29.4	38.1	25.5	48.1	23.6	4.1
Mean D.M. %		80.2	77.1	77.6	61.0		

*At 85% dry matter

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