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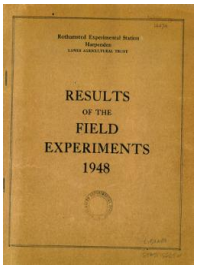
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1948

Full Table of Content



48/BA/1 Two-course Rotation - Rothamsted

Rothamsted Research

Rothamsted Research (1949) *48/BA/1 Two-course Rotation - Rothamsted ;* Yields Of The Field Experiments 1948, pp 11 - 15

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48/Ba/1.1

TWO COURSE ROTATION EXPERIMENT

Cumulative Effects of Agricultural Salt

Rothamsted 1948

(For full details see 1942 Report)

Treatments:
All combinations of:

(1) Agricultural salt: None, $2\frac{1}{2}$, 5 and $7\frac{1}{2}$ cwt per acre applied to sugar beet or at half these rates to barley.

(2) Muriate of potash: None, the equivalent of half the single dressing of salt (approximately 1 cwt. K_2O per acre), the equivalent of the single dressings of salt (approximately 2 cwt. K_2O per acre), applied to sugar beet at sowing.

(3) Time of application of salt: In seed bed at sowing, before ploughing in winter.

(4) Salt applied to sugar beet only, salt repeated at half rate on barley.

Note: treatment (3) applies to both sugar beet and barley crops; the barley receives no potash treatment. For ease of analysis K_2O of the muriate of potash dressings is made equivalent to Cl of agricultural salt dressings.

Basal dressings, applied to all plots at sowing:
Barley: 0.3 cwt. N per acre as sulphate of ammonia
Sugar beet: 0.8 cwt. N per acre as sulphate of ammonia
0.6 cwt. P_2O_5 per acre as superphosphate.

Cultivations, etc:

Sugar Beet. Series I. Long Hoos VII
Agricultural salt applied: Oct. 21. Ploughed: Nov. 10-21. Cultivated: Mar. 16. Rolled and springtine harrowed, ring rolled: Mar. 27. Sulphate of ammonia applied: Mar. 30. Superphosphate, agricultural salt and muriate of potash applied: Apr. 12. Harrowed: Apr. 14. Seed drilled: Apr. 15. Seed harrowed in: Apr. 16. Rolled: Apr. 22. Dusted with Flea beetle dust: May 14. Plots 6, 12, 18, 24, 30, 36, 42, 48 damaged by herbicide spray from adjacent barley; May 14. Bare patches resown: late May. Hoed: May 20-21, 25. Weeds hand pulled: June 9-11. Singled: June 10-11. Hoed: June 21 - July 22. Lifted: Nov. 23-30. Variety: Klein E. Previous crop: Barley.

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Barley. Series II. Long Hoos V.
Agricultural salt applied: Dec 2. Ploughed: Dec 10-12. Springtine harrowed: Mar 1. Harrowed, seed drilled, sulphate of ammonia applied: Mar 8. Applied agricultural salt, harrowed in, ring rolled: Mar 9. Sprayed with "Denocate" to clear charlock, (plots 66, 65, 64, 63, 62, 61 damaged by an overdose of spray): May 14. Hand weeded: June 30. Harvested: Aug. 14. Variety: Plumage Archer. Previous crop: Sugar Beet.

Standard errors per plot:

Sugar beet,	total sugar,	4.40	cwt. per acre or	10.9%
	tops,	1.13	tons per acre or	7.8%
Barley,	grain,	2.20	cwt. per acre or	7.1%

All standard errors estimated from 22 d.f.

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Series I: Sugar Beet

Salt in 1948 (cwt. per acre)	Muriate of potash K_2O cwt. per acre 0.0	1.0	2.0	Salt applied Winter	In seed bed	Mean
		Total Sugar: cwt. per acre				
		(±2.20)		(±1.68)		(±1.27)
0	33.4	34.2	35.7			34.4
2.5	43.7	37.9	40.2	41.6	39.6	40.6
5.0	41.8	44.6	42.0	42.2	43.5	42.8
7.5	41.9	44.6	46.1	43.4	45.1	44.2
Mean	40.2	40.3 (±1.10)	41.0	42.4	42.7 (±1.02)	40.5
		Sugar percentage				
0	16.24	16.34	16.57			16.38
2.5	16.49	16.46	16.78	16.57	16.58	16.57
5.0	16.75	16.90	16.42	16.58	16.80	16.69
7.5	16.59	16.62	16.84	16.78	16.60	16.69
Mean	16.51	16.58	16.65	16.64	16.66	16.58
		Roots (washed): tons per acre				
0	10.26	10.44	10.74			10.48
2.5	13.27	11.50	11.97	12.56	11.93	12.25
5.0	12.49	13.20	12.74	12.69	12.93	12.81
7.5	12.63	13.42	13.71	12.92	13.59	13.25
Mean	12.16	12.14	12.29	12.73	12.81	12.20
		Tops: tons per acre				
		(±0.566)		(±0.433)		(±0.327)
0	14.21	14.80	13.90			14.30
2.5	14.57	14.27	14.68	13.05	15.97	14.51
5.0	13.28	13.75	15.36	14.86	13.40	14.13
7.5	14.90	17.08	13.56	13.79	16.57	15.18
Mean	14.24	14.98 (±0.283)	14.37	13.90	15.31 (±0.261)	14.53

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Series I: Sugar Beet (contd.)

Salt in 1948 (cwt.per acre)	Muriate of potash K_2O cwt. per acre 0.0	1.0	2.0	Salt applied Winter	In seed bed	Mean
	Plant No.: thousands per acre					
0	22.3	22.2	21.4			22.0
2.5	22.0	21.9	22.3	21.9	22.3	22.1
5.0	21.9	22.6	21.6	21.7	22.3	22.0
7.5	22.1	22.4	21.5	22.2	21.8	22.0
Mean	22.1	22.3	21.7	21.9	22.1	22.0
	Noxious Nitrogen: m.g. per 100 grams.					
0	30.2	31.5	31.2			31.0
2.5	28.5	30.2	28.8	28.7	29.7	29.2
5.0	29.8	28.8	28.0	29.3	28.3	28.8
7.5	31.0	29.5	30.8	31.2	29.7	30.4
Mean	29.9	30.0	29.7	29.7	29.2	29.8

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Series II: Barley

Salt in 1947 (cwt. per acre)	Muriate of potash K_2O cwt. per acre applied in 1947 0.0	1.0	2.0	Salt applied Winter	In seed bed	Salt in 1948 None	Half Rate	Mean
	Grain:			cwt. per acre				
	(±1.10)			(±0.84)				(±0.63)
0	31.3	33.6	30.6					31.8
2.5	32.6	30.8	31.2	31.6	31.5	31.2	31.9	31.5
5.0	30.2	31.1	29.8	30.8	30.0	29.1	31.6	30.4
7.5	29.6	30.0	29.6	30.5	29.0	29.1	30.3	29.7
Mean	30.9	31.4	30.3	31.0	30.2	29.8	31.3	30.9
		(±0.55)			(±0.51)			
	Straw:			cwt. per acre				
0	35.9	37.0	35.3					36.1
2.5	36.8	33.2	34.7	34.8	34.9	35.6	34.1	34.9
5.0	32.7	33.4	32.0	31.9	33.5	32.1	33.3	32.7
7.5	32.4	32.2	31.5	31.4	32.7	30.7	33.4	32.0
Mean	34.4	34.0	33.4	32.7	33.7	32.8	33.6	33.9