ROTHAMSTED RESEARCH

Yields of the Field Experiments 1951

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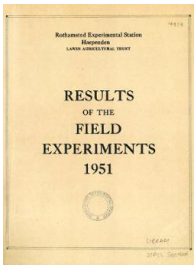

51/BG/1 Irrigation - Woburn

Rothamsted Research

Rothamsted Research (1952) *51/BG/1 Irrigation - Woburn ;* Yields Of The Field Experiments 1951, pp 53 - 59 **- DOI: https://doi.org/10.23637/ERADOC-1-171**

51/Bg/1.1

IRRIGATION EXPERIMENT

The 1st Year

The effects of irrigation and nitrogen - Woburn Butt Close 1951.

The present cropping comprises four series; three of these in turn carry the crops of a 3-course rotation:-

1st year: Early potatoes followed by winter cabbages
2nd year: Sugar beet
3rd year: Barley

The fourth series remains in long term grass for cutting.

System of replication: 3 randomized blocks of 4 plots each, plots being split into two for the application of nitrogen.

Treatments: All combinations of:-
Whole plots. Irrigation: None - 0, and three rates A, B, and C applied to crops as under.
Sub plots. Nitrogen: 2 levels applied to crops as under.

Irrigation in inches

Week ending	Early Potatoes			Sugar Beet			Barley			Cut Grass		
	A	B	C	A	B	C	A	B	C	A	B	C
June 18		.14	.35					.56	.77		.57	.76
25		.40	.50		1.20	1.40	.30	.47	.50	.33	.67	.79
July 2		.67	.65						.20			
9					.50	.67		.67	.61			.67
16		.83	.67						.69			
23						.68				.33	.50	.67
30												
Aug 6						.67			.48			.67
13												
20				1.67						.33	.50	
27												
Total: inches	NIL	2.04	2.17	1.67	1.70	3.42	0.30	1.70	3.25	0.99	2.24	3.56

Note. The irrigations shown above were not those originally intended since water was not available until the week ending June 18, and then only at low pressure. The full supply came in late summer in the middle of the wet period.

On Potatoes A was the same as 0.

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Levels of nitrogen (in addition to N in basal dressing):

	cwt N per acre		
Early Potatoes:	None;	0.5	Applied as sulphate of ammonia
Winter Cabbages (after potatoes):	0.5;	1.0	Applied as nitrochalk
Sugar beet:	None;	0.4	Applied as nitrochalk
Barley:	None;	0.2	Applied as sulphate of ammonia
Cut grass:	0.15;	0.30	Applied as nitrochalk after each cut

Basal manurings: cwt per acre.

	N	P_2O_5	K_2O
Early potatoes	0.5	0.5	0.75
Winter Cabbages (after potatoes)		NIL	
Sugar beet	0.4	0.4	0.6
Barley	0.2	0.2	0.3
Cut grass (yearly)		0.6	0.6

Cultivations, etc.:
Early Potatoes: Ploughed: Mar 8. Potatoes planted by machine: Apr 25. Fertilizers applied: Apr 25. Earthed up ridges: July 3 Lifted: July 31. Variety: Ulster Chieftain.
Winter Cabbages: Planted and watered in: Aug 2. Cut: Feb 5, 22, Mar 19, 25 and 26. Variety: January King.
Sugar beet: Seed drilled: Apr 24. Fertilizers applied: Apr 25. Singled: June 4. Lifted: Nov 13. Variety: Klein E.
Barley: Seed drilled: Apr 24. Fertilizers applied: Apr 25. Harvested: Aug 29. Variety: Plumage Archer.
Cut grass: Seeds mixture broadcast: Apr 24. Basal fertilizers applied: Apr 25. Cut: July 11, Aug 13, Sept 4, Oct 9. Nitrochalk applied after first three cuts. Seeds mixture (lb per acre): Italian Ryegrass (English leafy) - 6; S26 Cocksfoot - 16; S100 White Clover - 4; Canadian Alsike - 2.

Previous crop, all plots: Potatoes.

Standard errors per plot:

Early Potatoes.	Total clean tubers,	whole plot:	0.238 tons per acre or 4.2% (7 d.f.)
		sub plots:	0.307 tons per acre or 5.4% (9 d.f.)
Cabbages.	Weight headed cabbages,	whole plot:	0.274 tons per acre or 11.2% (6 d.f.)
		sub plot:	0.558 tons per acre or 22.7% (8 d.f.)

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Sugar beet.	Total sugar,	whole plot:	2.60 cwt per acre or 5.0% (6 d.f.)
		sub plot:	3.18 cwt per acre or 6.1% (8 d.f.)
	Tops,	whole plot:	0.581 tons per acre or 5.2% (6 d.f.)
		sub plot:	1.24 tons per acre or 11.1% (8 d.f.)
Barley.	Grain,	whole plot:	1.45 cwt per acre or 5.2% (6 d.f.)
		sub plot:	1.98 cwt per acre or 7.1% (8 d.f.)
Cut grass (total of 4 cuts)	Hay (85% D.M.)	whole plot:	4.95 cwt per acre or 8.9% (6 d.f.)
		sub plot:	2.90 cwt per acre or 5.2% (8 d.f.)

Summary of Results

Early Potatoes. Total tubers tons per acre

cwt N per acre	Irrigation 0	B	C	Mean
	(±0.130)*	(±0.183)*		
0	3.78	6.76	7.66	5.49
0.5	3.88	6.97	8.56	5.82
Mean	3.83 (±0.097)	6.86 (±0.137)	8.11	5.66
Difference	0.10 (±0.177)	0.21 (±0.251)	0.90	0.33 (±0.125)

*for use in comparisons other than vertical.

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Winter Cabbages

cwt N per acre	Irrigation to previous potato crop 0	A	B	C	Mean
Weight of headed cabbage: tons per acre (±0.278)*					
0.5	2.47	2.31	1.80	1.71	2.07
1.0	3.27	2.96	2.13	2.98	2.85
Mean (±0.158)	2.87	2.63	1.98	2.34	2.46
Difference (±0.456)	0.80	0.65	0.38	1.27	0.78 (±0.228)

*for use in comparisons other than vertical

Total produce: tons per acre					
0.5	6.22	6.19	5.52	5.75	5.92
1.0	7.75	7.60	6.64	7.51	7.37
Mean	6.98	6.89	6.08	6.63	6.65
Difference	1.53	1.41	1.12	1.76	1.45
Percentage (by number) of Headed Cabbages					
0.5	36.7	33.0	27.2	27.3	31.1
1.0	40.9	38.1	30.9	38.7	37.2
Mean	38.8	35.6	29.1	33.0	34.1
Difference	4.2	5.1	3.7	11.4	6.1

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Sugar Beet

cwt N per acre	Irrigation 0	A	B	C	Mean
Clean beet: tons per acre					
0	12.56	13.76	13.41	13.48	13.30
0.4	16.50	16.05	17.55	18.17	17.07
Mean	14.53	14.91	15.48	15.82	15.19
Difference	3.94	2.29	4.14	4.69	3.77
Sugar percentage					
0	17.34	17.22	17.21	17.06	17.21
0.4	17.23	16.73	17.43	17.21	17.15
Mean	17.28	16.98	17.32	17.13	17.18
Difference	-0.11	-0.49	0.22	0;15	-0.06
Total sugar: cwt per acre			(±1.98)*		
0	43,5	47.5	46.2	46.0	45.8
0.4	56.8	53.7	61.1	62.5	58.6
Mean (±1.50)	50.2	50.6	53.7	54.3	52.2
Difference (±2.60)	13.3	6.2	14.9	16.5	12.8 (±1.30)

*for use in comparisons other than vertical.

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Sugar Beet

cwt N per acre	Irrigation 0	A	B	C	Mean
	Tops: tons per acre				
			(±0.606)*		
0	7.96	9.04	8.08	9.62	8.68
0.4	12.66	14.28	12.45	14.68	13.52
Mean (±0.336)	10.31	11.66	10.27	12.15	11.10
Difference (±1.010)	4.70	5.24	4.37	5.06	4.84 (±0.505)

*for use in comparisons other than vertical.

	Noxious nitrogen: mg./100 g.				
0	26.7	28.3	30.0	26.7	27.9
0.4	28.3	30.0	30.0	28.3	29.2
Mean	27.5	29.2	30.0	27.5	28.5
Difference	1.6	1.7	0.0	1.6	1.3

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cwt N per acre	Irrigation 0	A	B	C	Mean
Barley, grain: cwt per acre					
			(±1.16)*		
0	21.7	22.1	25.8	29.0	24.6
0.2	30.1	29.5	31.7	33.2	31.1
Mean (±0.84)	25.9	25.8	28.8	31.1	27.9
Difference (±1.61)	8.4	7.4	5.9	4.2	6.5 (±0.81)
Barley, straw: cwt per acre					
0	22.2	22.5	26.7	32.5	26.0
0.2	29.6	27.7	32.1	36.1	31.4
Mean	25.9	25.1	29.4	34.3	28.7
Difference	7.4	5.2	5.4	3.6	5.4
Cut Grass (Total of 4 cuts): Hay at 85% D.M. : cwt per acre					
after each cut			(±3.09)*		
0.15	40.5	42.9	51.5	60.1	48.8
0.30	56.9	57.9	65.3	70.0	62.5
Mean (±2.86)	48.7	50.4	58.4	65.1	55.6
Difference (±2.36)	16.4	15.0	13.8	9.9	13.7 (±1.18)

*for use in comparisons other than vertical.

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