

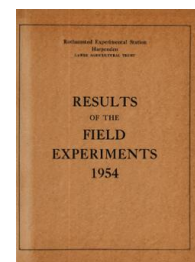
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Yields of the Field Experiments 1954

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54/W/BG/1 Irrigation

Rothamsted Research

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54/Bg/1.1

IRRIGATION EXPERIMENT

The 4th year

The effects of irrigation and nitrogen - Woburn Butt Close 1954.

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

- 1st year: Potatoes
- 2nd year: Sugar beet
- 3rd year: Barley

The fourth series (formerly 3-year ley) was resown to 3-year S37 in 1954. Cocksfoot ley for cutting.

In 1954 maincrop potatoes replaced early potatoes followed by cabbages.

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

Area of each sub plot: Cut grass - 0.0264, remainder - 0.0278 acre.
 Area harvested: Cut grass - 0.0165, potatoes - 0.0155,
 sugar beet - 0.0176, barley - 0.0168 acre.

Treatments: All combinations of:-

Whole plots. Irrigation: None (0) and 3 other treatments A, B and C as specified below

N.B: On potatoes 0 = B. On sugar beet, 0 = B and A = C. On cut grass, 0 plots received .50" irrigation.

Sub plots. Nitrogen: 2 levels applied to crop as below.

Rainfall and Irrigation: inches

Week- ending	Rainfall	Potatoes			Sugar beet	Barley			Cut Grass			
		A	B	C	A & C	A	B	C	0	A	B	C
May 17	0.04					.50		.50	.50	.50	.50	.50
24	0.18				.50	.50		.50		.25	.25	.25
31	1.40	.50		.50							.25	.50
June 7	1.08											
14	1.73											
21	0.01											
28	0.08			.50							.50	.67
July 5	0.26	.85		.75	.75		.75	.75		.25	.25	.51
12	0.26	.40								.17		
19	0.90			.20							.27	.51
26	0.75	.42		.24								
Total	6.69	2.17		2.19	1.25	1.00	.75	1.75	.50	1.17	2.02	2.94

54/Bg/1.2

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

N cwt per acre as nitrochalk

Potatoes	None; 0.5
Sugar beet	None; 0.4
Barley	None; 0.2
Cut grass	0.15; 0.3 (in spring and after each cut)

Basal dressings: cwt per acre

As compound fertilizer

	N	P ₂ O ₅	K ₂ O	Salt	Dung
Potatoes	0.5	0.5	0.75	-	15 tons
Sugar beet	0.4	0.4	0.6	5	-
Barley	0.2	0.2	0.3	-	-
Cut grass (yearly)	None	0.6	1.2	-	-

Cultivations, etc.:

Potatoes. Ploughed: Aug 25 and again Oct 21, 1953. F.Y.M. applied: Mar 23, 1954. Ploughed: Mar 23. Fertilizers applied: Mar 30. Potatoes planted by machine: Apr 6. Earthed up: June 15. Sprayed with copper fungicide, medium volume, 5 lb in 40 gallons per acre: July 30. At low volume, 5 lb in 10 gallons: Aug 16 and again Aug 27. Sprayed with 20% sulphuric acid: Sept 23. Lifted: Oct 7. Variety: Majestic.

Sugar beet. Ploughed: Mar 2. Fertilizers applied: Mar 30. Seed drilled at 18 lb per acre: Apr 5. Singled: May 28. Sprayed with Parathion, low volume: June 18. Lifted: Oct 27. Variety: Klein E.

Barley. Ploughed: Dec 24, 1953. Fertilizers applied: Mar 15, 1954. Seed drilled at 3 bushels per acre: Mar 16. Harvested: Aug 16. Variety: Herta.

Cut grass. Ploughed: Nov 24, 1953. Basal fertilizer and nitrochalk applied: Apr 6, 1954. Grass seed sown at 28 lb per acre: Apr 7. Sprayed MCPA, low volume, 2 pints per acre: June 19. Cut: June 16, July 15 (high N plots), July 23 (low N plots), July 30 (high N plots), Aug 17, Sept 10, Nov 4. Nitrochalk applied after each cut except the last. Variety: Cocksfoot S37.

54/Bg/1.3

Standard errors per plot:

Potatoes,	Total tubers,	whole plot:	0.731 tons per acre or 4.7%	(7 d.f.)
		sub plot:	1.069 tons per acre or 6.9%	(9 d.f.)
Sugar beet,	Total sugar,	whole plot:	4.83 cwt per acre or 10.9%	(8 d.f.)
		sub plot:	4.25 cwt per acre or 9.6%	(10 d.f.)
	Tops,	whole plot:	1.21 tons per acre or 12.5%	(8 d.f.)
		sub plot:	1.16 tons per acre or 12.0%	(10 d.f.)
Barley,	Grain,	whole plot:	1.08 cwt per acre or 3.1%	(6 d.f.)
		sub plot:	1.75 cwt per acre or 4.9%	(8 d.f.)
Cut grass	Hay (85% D.M.),	whole plot:	6.89 cwt per acre or 14.3%	(6 d.f.)
(total of 6 cuts)		sub plot:	5.01 cwt per acre or 10.4%	(8 d.f.)

Summary of Results

cwt N per acre	O & B	Irrigation A	C	Mean
Potatoes, total tubers: tons per acre				
	(±0.429) ^{**}	(±0.607) ^{**}		
0.0	14.06	13.42	13.25	13.70
0.5	17.88	16.94	16.95	17.41
Mean	(±0.422) 15.97 ⁽¹⁾	15.18	15.10	15.55
Difference	(±0.873) 3.82 ⁽²⁾	3.52	3.70	3.71 (±0.436)
Potatoes, percentage ware				
0.0	87.0	83.7	85.5	85.8
0.5	91.2	86.2	88.4	89.8
Mean	89.1	86.0	87.0	87.8
Difference	4.2	4.5	2.9	4.0

(1) ±0.298

(2) ±0.617

^{**} for use in comparisons other than vertical.

54/Bg/1.4

cwt N per acre	Irrigation				Mean
	0	A	B	C	
Barley, grain: cwt per acre					
(± 0.949) [‡]					
0.0	31.3	35.7	35.6	33.1	33.9
0.2	36.8	36.3	38.6	36.0	36.9
Mean (± 0.625)	34.0	36.0	37.1	34.6	35.4
Difference (± 1.428)	5.5	0.6	3.0	2.9	3.0 (± 0.714)

Barley, straw: cwt per acre					
0.0	25.5	29.3	28.4	28.3	27.9
0.2	35.7	35.0	33.8	36.3	35.2
Mean	30.6	32.1	31.1	32.3	31.5
Difference	10.2	5.7	5.4	8.0	7.3

Cut grass, hay (at 85% D.M.) 6 cuts: cwt per acre					
(± 4.47) [‡]					
0.15	37.9	37.5	35.0	38.4	37.2
0.30	61.6	56.0	59.5	60.8	59.5
Mean (± 3.98)	49.8	46.7	47.2	49.6	48.3
Difference (± 4.09)	23.7	18.5	24.5	22.4	22.3 (± 2.04)

cwt N per acre	Irrigation		Mean
	C & B	A & C	
Sugar beet, roots (washed): tons per acre			
0.0	12.26	12.46	12.36
0.4	13.56	13.30	13.43
Mean	12.91	12.88	12.90
Difference	+1.30	+0.84	+1.07

Sugar beet, sugar percentage			
0.0	17.1	17.2	17.1
0.4	17.2	17.3	17.2
Mean	17.1	17.2	17.2
Difference	0.1	0.1	0.1

[‡] for use in comparisons other than vertical

54/Bg/1.5

cwt N per acre	Irrigation		Mean
	C & B	A & C	
Sugar beet, total sugar: cwt per acre			
	(± 2.32) [*]		
0.0	41.9	42.8	42.4
0.4	46.6	46.1	46.4
Mean	(± 1.96)	44.3	44.5
Difference	(± 2.46)	-4.7	3.3
			-4.0 (± 1.74)

Sugar beet, tops: tons per acre			
	(± 0.597) [*]		
0.0	9.11	9.23	9.17
0.4	10.07	10.28	10.17
Mean	(± 0.494)	9.59	9.75
Difference	(± 0.672)	-0.96	1.05
			-1.00 (± 0.475)

Sugar beet, noxious nitrogen: mg per 100 g.			
0.0	25	25	25
0.4	30	25	25
Mean	25	25	25
Difference	5	0	0

^{*}for use in comparisons other than vertical.