

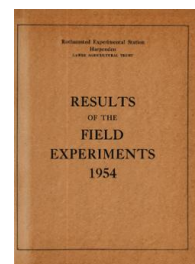
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Yields of the Field Experiments 1954

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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 A & C	Barley			Cut Grass			
		A	B	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 (total of 6 cuts)	Hay (85% D.M.)	whole plot:	6.89 cwt per acre or 14.3%	(6 d.f.)
		sub plot:	5.01 cwt per acre or 10.4%	(8 d.f.)

Summary of Results

cwt N per acre	O & B	Irrigation		Mean
		A	C	
Potatoes, total tubers: tons per acre				
	(± 0.429) [*]	(10.607) [*]		
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⁾	15.10	15.55
Difference	(± 0.873)	3.82 ⁽²⁾	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					
	$(\pm 0.949)^{\#}$				
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	35.4
Difference	(± 1.428)	5.5	0.6	3.0	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	31.5
Difference		10.2	5.7	5.4	7.3
Cut grass, hay (at 85% D.M.) 6 cuts: cwt per acre					
	$(\pm 4.47)^{\#}$				
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	48.3
Difference	(± 4.09)	23.7	18.5	24.5	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) ^{SE}		
0.0	41.9	42.8	42.4
0.4	46.6	46.1	46.4
Mean	(± 1.96)	44.5	44.4
Difference	(± 2.46)	3.3	-4.0 (± 1.74)

Sugar beet, tops: tons per acre			
	$(\pm 0.597)^*$		
0.0	9.11	9.23	9.17
0.4	10.07	10.28	10.17
Mean	(± 0.494)		9.67
Difference	(± 0.672)		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.