

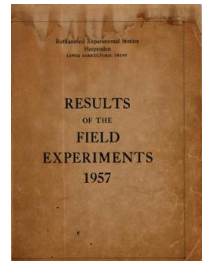
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Yields of the Field Experiments 1957

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57/W/BG/1 Irrigation

Rothamsted Research

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57/Bg/1.1

IRRIGATION EXPERIMENT

Revised 1957 (the 7th year)

The effects of irrigation and nitrogen - Woburn Butt Close 1957.

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

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

1st year: Spring beans
2nd year: Sugar beet
3rd year: Spring wheat

The fourth series remains in long term cocksfoot ley for cutting.

Area of each sub plot (acres): Cut grass, 0.0264; remainder, 0.0278.
Area harvested (acres): Sugar beet, 0.0176; spring wheat, 0.0089;
spring beans, 0.0082; cut grass, 0.0165.

Design: 3 randomized blocks of 4 plots each, plots being split into two for the application of nitrogen. In the case of the spring beans there is no test of nitrogen, but the plots are split at right angles to the old nitrogen split, in order to test the effect of dung.

Treatments. All combinations of:-

Whole plots. Irrigation and insecticide:

Sugar beet: nil (0); 3 levels of irrigation. X
Spring wheat: nil (0); 1 level of irrigation. X
Spring beans: (nil (0); irrigation) x (nil; insecticide spray).
Grass: nil (0); 3 levels of irrigation.

The insecticide spray was Metasystox, 60 gallons (12 oz. 50% active Metasystox) per acre.

Sub plots. Nitrogen applied to all crops except spring beans at 2 levels as under:

Dung (applied to spring beans only): None; 12 tons per acre. ✓

57/Bg/1.2

Rainfall and Irrigation: inches

Week ending	Rain-fall	Cut grass			Sugar beet			Wheat	Beans
		A	B	C	A	B	C	A & C	C
May 6	.02			.50					.50
13	.79		.64	.64				.50	
20	.52								
27	.20								
June 3	-			.50				.50	.50
10	.82		.53	.50	.50		.50	.50	.50
17	-	.54	.50	.75	.75		.75		
24	.04	.96		.50				.75	.75
July 1	1.15	.17	.50	1.00	.75		.75		1.25
8	.26		.50	.50	.75		.75	.50	
15	.73		3		early	.28	.28	.50	.50
22	1.10		3	.48					
29	.56		3						
Aug 5	-								
12	1.65					.52	.52		
19	1.08								
26	.45								
Sept 2	.51								
9	.36								
16	.77								
23	.13								
30	1.25								
Total	12.36	1.67	2.67	5.37	2.75	.80	3.55	3.25	4.00

Note: On wheat 0 = B, A = C.

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

Sugar beet: None; 0.6 applied as 'Nitro-Chalk'.

Spring wheat: None; 0.4 applied as 'Nitro-Chalk'.

Spring beans: No test of nitrogen; residual effect of nitrogen to previous crop not measured.

Grass: 0.3; 0.6 applied as 'Nitro-Chalk' in spring and again after each cut, except the last.

Basal dressing (per acre): Sugar beet, $8\frac{1}{2}$ cwt compound fertilizer (7% N, 7% P_2O_5 , 10.5% K_2O), 5 cwt salt. Spring wheat, 6 cwt compound fertilizer (7% N, 7% P_2O_5 , 10.5% K_2O). Spring beans, 4 cwt compound fertilizer (10% P_2O_5 , 20% K_2O). Cut grass, 6 cwt compound fertilizer (10% P_2O_5 , 20% K_2O).

57/Bg/1.3

Cultivations, etc.:

Sugar beet. Ploughed: Nov 10, 1956. Ground chalk applied:
 Feb 27, 1957. Salt applied: Mar 4. Fertilizers applied:
 Apr 9. Seed drilled at 12 lb per acre: Apr 11. Singled:
 June 7 - 11. Lifted: Nov 1. Variety: Klein E.
 Spring wheat. Ploughed: Dec 20, 1956. Fertilizers applied:
 Mar 15, 1957. Seed drilled at 3 bushels per acre: Mar 16.
 Combine harvested: Aug 21. Variety: Peko.
 Spring beans. Ploughed: Nov 10, 1956 and Dec 20 - 21. Dung applied:
 Dec 20. Fertilizers applied: Mar 14, 1957. Seed drilled at
 200 lb per acre: Mar 14. Sprayed with Metasystox: June 12.
 Combine harvested: Aug 21. Variety: Garton's Spring Tick.
 Grass. Basal fertilizers applied: Autumn. 'Nitro-Chalk' applied:
 Mar 7, 1957. Cut 8 times (all plots): Apr 23, May 24, June 19,
 July 12, Aug 16, Sept 10, Nov 5. 'Nitro-Chalk' applied after
 each cut except the last. Variety: Cocksfoot S37.

Standard errors per plot.

Sugar beet.	Total sugar, whole plot:	1.27 cwt per acre or 2.1%
		(6 d.f.)
	sub plot:	4.42 cwt per acre or 7.4%
		(8 d.f.)
Tops,	whole plot:	.705 tons per acre or 4.5%
		(6 d.f.)
	sub plot:	.982 tons per acre or 6.2%
		(8 d.f.)
Spring wheat. Grain (at	whole plot:	4.55 cwt per acre or 16.2%
85% D.M.),		(8 d.f.)
	sub plot:	3.21 cwt per acre or 11.4%
		(10 d.f.)
Spring beans. Grain (at	whole plot:	1.62 cwt per acre or 7.2%
85% D.M.),		(6 d.f.)
	sub plot:	1.48 cwt per acre or 6.5%
		(8 d.f.)
Cut grass.	Dry matter, whole plot:	5.10 cwt per acre or 6.2%
		(6 d.f.)
	sub plot:	2.11 cwt per acre or 2.6%
		(8 d.f.)

57/Bg/1.4

Summary of Results

Sugar beet

N: cwt per acre including basal	0	Irrigation			Mean
		A	B	C	
Roots (washed): tons per acre					
		$(\pm 0.531)^*$			
~~0.6~~ 1.2	16.64	15.70	16.74	16.23	16.33
	17.83	17.92	16.76	17.21	17.43
Mean (± 0.192)	17.23	16.81	16.75	16.72	16.87
Diff. (± 0.990)	+1.19	+2.22	+0.02	+0.98	+1.10 (± 0.495)
Sugar percentage					
		$(\pm 0.23)^*$			
~~0.6~~ 1.2	18.0	17.7	17.9	18.3	18.0
	17.8	17.7	17.3	17.5	17.6
Mean (± 0.16)	17.9	17.7	17.6	17.9	17.7
Diff. (± 0.34)	-0.2	0.0	-0.6	-0.8	-0.4 (± 0.17)
Total sugar: cwt per acre					
		$(\pm 1.95)^*$			
~~0.6~~ 1.2	59.9	55.6	59.7	59.3	58.6
	63.6	63.4	58.1	60.1	61.3
Mean (± 0.73)	61.7	59.5	58.9	59.7	59.9
Diff. (± 3.61)	+3.7	+7.8	-1.6	+0.8	+2.7 (± 1.80)
Tops: tons per acre					
		$(\pm 0.571)^*$			
~~0.6~~ 1.2	12.86	12.85	13.04	10.21	12.24
	18.72	19.33	19.66	19.96	19.42
Mean (± 0.406)	15.79	16.09	16.35	15.08	15.82
Diff. (± 0.802)	+5.86	+6.48	+6.62	+9.75	+7.18 (± 0.401)

*For use in comparisons other than vertical.

57/Bg/1.5

Spring wheat

Grain (at 85% dry matter): cwt per acre

N: cwt per acre including basal	Irrigation		Mean
	O & B	A & C	
	(±2.08)*		
0.4	25.4	28.0	26.7
0.8	25.8	33.0	29.4
Mean (±1.86)	25.6	30.5	28.1
Diff. (±1.85)	0.4	5.0	2.7 (±1.31)

*For use in comparisons other than vertical.

Mean dry matter % as harvested: 81.9

Spring beans

Grain (at 85% dry matter): cwt per acre

Dung: tons per acre	0	Irrigation			Mean
		C	OS	CS	
		(±1.11)*			
None	13.1	30.7	14.6	30.3	22.2
12	16.4	29.7	16.3	30.6	23.3
Mean (±0.93)	14.8	30.2	15.5	30.4	22.7
Diff. (±1.21)	+3.3	-1.0	+1.7	+0.3	+1.1 (±0.60)

*For use in comparisons other than vertical.

Mean dry matter % as harvested: 74.7

C = Irrigation
S = Metasystox spray.

57/Bg/1.6

Cut grass

Dry matter: cwt per acre
(Total of 8 cuts)

N: cwt per acre including basal	Irrigation				Mean
	0	A	B	C	
		$(\pm 3.06)^*$			
0.3	63.0	69.7	70.0	81.5	71.0
0.6	84.3	92.6	94.7	101.1	93.2
Mean (± 2.93)	73.6	81.1	82.3	91.3	82.1
Diff. (± 1.72)	21.3	22.9	24.7	19.6	22.2 (± 0.86)

*For use in comparisons other than vertical.