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Yields of the Field Experiments 1963

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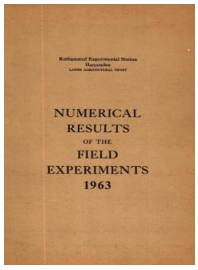

63/W/WIR/B/6 Irrigation

Rothamsted Research

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63/B/6.1

IRRIGATION EXPERIMENT

(WIR)

Revised 1963, the 13th year

The effects of irrigation and nitrogen - Woburn Butt Close, 1963.

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

The 3 course rotation is now as follows:-
1st year: sugar beet (following spring beans 1962).
2nd year: barley - undersown (following early potatoes 1962).
3rd year: clover (following barley 1962) - Crimson clover in 1963, double-cut red clover in following years.

Revised treatments.
Sugar beet: A test of early v normal singling is applied on strips of 4 half plots, north v south.
The original nitrogen test to sub plots (as for early potatoes) is continued at the following rates: None, 0.75 cwt N as sulphate of ammonia (in addition to basal dressing).
The trefoil green manure sown after early potatoes for barley and the comparison of normal and chemical weed control to early potatoes are discontinued.
Lucerne: Irrigation treatments are now: nil (O), early (A), late (B), full (C).

Revised basal dressing per acre:
Sugar beet: 0.75 cwt each of N, P_2O_5 and K_2O as compound fertiliser (10% N, 10% P_2O_5, 10% K_2O), 5 cwt agricultural salt, applied in winter and ploughed in in spring (applied in spring after ploughing in 1963).
Clover: 0.75 cwt P_2O_5, 1.5 cwt K_2O as compound fertiliser (14% P_2O_5, 28% K_2O), applied in winter (in spring 1963 to Crimson clover).

Area harvested (acres): Sugar beet, sub sub plot - 0.0056, Barley, whole plot - 0.0092, Clover, whole plot - 0.0117, Lucerne, sub plot - 0.0165.

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Rainfall and Irrigation: inches

Week ending	Rain-fall	Barley C	Sugar beet A	Sugar beet B	Sugar beet C	Clover A	Clover B	Clover C	Lucerne A	Lucerne B	Lucerne C
May 6	0.55										
13	0.35										
20	0.12										
27	0.48								0.50		0.50
June 3	0.03	0.50	0.50		0.50	0.50		0.50			
10	0.03								0.50		0.50
17	0.19	1.00	1.00		1.00	1.00		1.00	1.00		1.00
24	0.41	0.75	0.75		0.75	0.75		0.75			
July 1	0.63	0.50	0.50		0.50	0.50		0.50		0.75	0.75
8	0.80										
15	0.37										
22	0.23			1.00							
29	0.08			1.00	0.50		0.50	0.50		0.50	0.50
Aug 5	1.01										
12	0.26										
19	0.51										
26	0.63										
Sept 2	1.03										
9	0.98										
16	0.15										
23	0.03										
30	0.65										
Total	9.52	2.75	2.75	2.00	3.25	2.75	0.50	3.25	2.00	1.25	3.25

Cultivations, etc.:

Sugar beet. Ploughed: Oct 10, 1962. Salt applied: Mar 4, 1963. Basal compound and sulphate of ammonia applied: Apr 8. Seed drilled at 6 lb per acre: Apr 22. Singled: early - May 27, late - June 7. Sprayed with demeton methyl at 6 fluid oz in 40 gallons per acre (against leaf miner and first appearance of aphids): June 5. Lifted: Nov 5. Variety: Klein E.

Barley. Ground chalk applied at 40 cwt per acre: Feb 15, 1963. Ploughed: Mar 13. Basal compound and 'Nitro-Chalk' applied: Apr 9. Seed drilled at 2.3 bushels per acre, clover sown at 30 lb per acre: Apr 18. Combine harvested: Sept 10. Variety: Proctor.

Clover. Ploughed twice: Aug 27, Nov 1, 1962. Basal compound fertiliser applied: Apr 8, 1963. Seed sown at 30 lb per acre: Apr 18. Cut: July 10. Samples cut for estimation of dry matter ploughed in: Aug 19. Variety: Crimson clover (inoculated seed).

Lucerne. Ground chalk applied at 20 cwt per acre: Feb 15, 1963. 'Nitro-Chalk', muriate of potash and basal P applied: Mar 7. Cut 3 times: June 19, July 29, Sept 27. Muriate of potash applied after first 2 cuts. Variety: Du Puits.

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Standard errors per plot.

Sugar beet.	Roots (washed)	Whole plot:	0.724 tons per acre or 4.1% (6 d.f.)
		Sub plot:	0.606 tons per acre or 3.4% (8 d.f.)
		Strip:	0.989 tons per acre or 5.6% (16 d.f.)
	Total sugar	Whole plot:	2.63 cwt per acre or 4.0% (6 d.f.)
		Sub plot:	2.16 cwt per acre or 3.3% (8 d.f.)
		Strip:	4.61 cwt per acre or 7.0% (16 d,f.)
	Tops	Whole plot:	1.382 tons per acre or 12.2% (6 d.f.)
		Sub plot:	1.007 tons per acre or 8.9% (8 d.f.)
		Strip:	0.928 tons per acre or 8.2% (16 d.f.)
Clover, dry matter			1.51 cwt per acre or 7.1% (8 d.f.)

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Summary of Results

Sugar beet

	Irrigation O	A	B	C	Mean
	Roots (washed): tons per acre				
Mean (±0.418)	16.94	17.12	18.85	17.73	17.66
N: cwt per acre including basal		(1) and (2)			(±0.175)
0.75	16.35	16.30	18.47	16.47	16.90
1.50	17.54	17.93	19.24	19.00	18.43
Singled		(±0.404)*			
Early	16.47	16.56	18.88	17.81	17.43
Late	17.42	17.67	18.82	17.65	17.89
	Sugar percentage				
Mean	18.6	18.7	18.7	18.8	18.7
N: cwt per acre including basal					
0.75	19.0	18.8	18.9	19.1	19.0
1.50	18.2	18.5	18.5	18.5	18.4
Singled					
Early	18.6	18.6	18.6	18.8	18.7
Late	18.6	18.7	18.7	18.8	18.7

* For use in interaction comparisons only

(1) (±0.350). For use in horizontal and interaction comparisons only
(2) (±0.485). For use in vertical and diagonal comparisons only

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Sugar beet

	Irrigation O	A	B	C	Mean
	Total sugar: cwt per acre				
Mean (±1.52)	63.0	64.0	70.5	66.6	66.0
N: cwt per acre including basal		(1) and (2)			(±0.62)
0.75	62.3	61.4	69.8	62.9	64.1
1.50	63.7	66.5	71.3	70.4	68.0
Singled		(±1.88)*			
Early	61.3	61.8	70.6	67.1	65.2
Late	64.7	66.2	70.5	66.2	66.9
	Tops: tons per acre				
Mean (±0.798)	11.51	11.32	11.98	10.53	11.34
N: cwt per acre including basal		(3) and (4)			(±0.291)
0.75	9.36	9.47	10.32	8.99	9.54
1.50	13.65	13.17	13.65	12.06	13.13
Singled		(±0.379)*			
Early	11.38	10.74	11.96	10.16	11.06
Late	11.64	11.90	12.01	10.90	11.61

* For use in interaction comparisons only

(1) (±1.25). For use in horizontal and interaction comparisons only
(2) (±1.75). For use in vertical and diagonal comparisons only
(3) (±0.581). For use in horizontal and interaction comparisons only
(4) (±0.897). For use in vertical and diagonal comparisons only

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

Weed control**	Irrigation O	Irrigation C
Normal cultivation	22.9	28.3
Trietazine spray	25.6	27.2

Green manure	Weed control** Normal cultivation	Weed control** Trietazine spray
None	24.2	23.9
Trefoil	26.2	27.6

N: cwt per acre including basal	Irrigation O	Irrigation C	Weed control** Normal cultivation	Weed control** Trietazine spray	Green manure None	Green manure Trefoil	Mean
0.3	20.1	23.3	21.3	22.1	18.7	23.2	21.7
0.6	28.3	32.2	29.9	30.7	29.4	30.8	30.3
Mean	24.2	27.8	25.6	26.4	24.1	27.0	26.0

Mean dry matter % as harvested: 79.7

Clover. Dry matter: cwt per acre

	Irrigation O	Irrigation C	Mean
	17.0 (±0.62)	25.8	21.4

Mean dry matter % as cut: 11.2

** To early potatoes 1962

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Lucerne. Dry matter: cwt per acre

	Irrigation O	A	B	C	Mean
		1st cut			
Mean	26.0	28.6	27.7	25.9	27.0
N: cwt per acre					
None	23.6	27.9	27.1	25.8	26.1
0.3	28.4	29.2	28.2	25.9	27.9
K_2O: cwt per acre*					
0.3	26.5	27.7	25.9	22.9	25.8
0.9	25.5	29.4	29.4	28.8	28.3
		2nd cut			
Mean	18.2	16.6	19.1	12.5	16.6
N: cwt per acre					
None	17.1	17.0	19.0	12.4	16.4
0.3	19.3	16.3	19.3	12.7	16.9
K_2O: cwt per acre*					
0.3	18.3	16.2	17.9	10.1	15.6
0.9	18.1	17.0	20.4	15.0	17.7
		3rd cut			
Mean	19.9	19.8	20.2	17.0	19.2
N: cwt per acre					
None	19.3	20.2	20.0	16.8	19.1
0.3	20.6	19.4	20.4	17.3	19.4
K_2O: cwt per acre*					
0.3	20.3	19.9	19.5	15.9	18.9
0.9	19.6	19.6	20.9	18.2	19.6

Mean dry matter % as cut:
1st cut 19.4
2nd cut 19.6
3rd cut 19.8

* For each cut

Note: For 1st cut O = B
A = C.

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Lucerne. Dry matter: cwt per acre

	Irrigation O	A	B	C	Mean
	Total of 3 cuts				
Mean	64.1	65.0	67.0	55.5	62.8
N: cwt per acre					
None	60.0	65.1	66.0	55.0	61.5
0.3	68.3	64.8	68.0	55.9	64.3
K_2O: cwt per acre					
0.3	65.1	63.9	63.3	48.9	60.3
0.9	63.2	66.1	70.8	62.0	65.5

Mean dry matter % as cut:
Total of 3 cuts 19.6