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Numerical Results of the Field Experiments 1968

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68/C/6 Irrigation - Potatoes, S. Beans

Rothamsted Research

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68/c/6.1

IRRIGATION

(IR)

The effect of irrigation on potatoes and spring beans, Great Field I and II, 1968.

Design:

Potatoes: A single replicate of 2 blocks, each of 4 plots, with (KE v M) x (O-A-B+C) x (N⁴-N³+N²-N¹) confounded with blocks. Plots divided into 6 sub plots, each subdivided into 2.
Spring beans: 2 randomised blocks of 4 plots each split into 7.

Area of each sub plot:-

Potatoes (1/12th plot): 0.0204. Area harvested: 0.0054.
Beans: 0.0321. Area harvested: 0.0193.

Treatments:

Potatoes:- All combinations of:-

Whole plots: 1. Irrigation: None (O), early (A), late (B), full (C).

To strips of 2. Varieties and spacing: King Edward (KE), four 1/6th Majestic (M). Each variety with seed plots: planted either 12(S1), 15(S2) or 18(S3) inches apart within the row.

1/12th plots: 3. Nitrogen: 1.0 (N1), 1.5 (N2), 2.0 (N3), 2.5 (N4) cwt N, 1 cwt as compound fertiliser (basal), the remainder as 'Nitro-Chalk'.

Spring beans:- All combinations of:-

Whole plots: 1. Irrigation: None (O), early (A), late (B), full (C).

Sub plots: 2. Aphicides (applied before flowering): None (O), 1.0 lb disulfoton in granules (DG), 1.0 lb disulfoton in granules applied early (DGE), 1.0 lb phorate in granules (PG), 1.0 lb phorate in granules applied early (PGE), 3.5 oz demeton-s-methyl in 37 gals (MS), 4.8 oz dimethoate in 37 gals (RS).

Basal applications:

Potatoes: 10 cwt (10:15:20). Weedkillers: Dalapon at 11 lb in 32 gals to bean stubble, paraquat at 0.38 lb plus linuron at 0.75 lb in 36 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz applied with mancozeb on one occasion.

Spring beans: 3.25 cwt (0:14:28) placement drilled. Weedkiller: Simazine at 1 lb in 33 gals.

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Cultivations, etc.:-

Potatoes: Dalapon applied: 13 Oct, 1967. Ploughed: 13 Nov.
 Basal NPK compound applied: 22 Mar, 1968. 'Nitro-Chalk'
 applied, plots rotary cultivated, potatoes machine planted:
 3 Apr. Paraquat and linuron applied: 3 May. Plots grubbed
 and rotary ridged: 10 June. Mancozeb applied: 3 July.
 Mancozeb and demeton-s-methyl applied: 19 July. Sprayed
 with undiluted BOV at 15 gals: 30 Aug. Lifted: 3 Oct.
 Previous crops: Barley 1966, spring beans 1967.
 Spring beans: Ploughed: 28 Sept, 1967. Seed drilled at 200 lb:
 5 Mar, 1968. Simazine applied: 8 Mar. PGE and DGE treatments
 applied: 7 June. PG and DG treatments applied: 22 June. MS
 treatment applied: 24 June. RS treatment applied: 29 June.
 Combine harvested: 12 Sept. Variety: Maris Bead. Previous
 crops: Potatoes 1966, barley 1967.

RAINFALL AND IRRIGATION: INCHES

Week- ending	Rain- fall	IRRIGATION					
		Beans			Potatoes		
		A	B	C	A	B	C
May 5	1.22						
May 12	0.96						
May 19	0.32						
May 26	0.21						
June 2							
June 9	0.44	1.00		1.00			
June 16	0.08				1.00		1.00
June 23	0.52		1.00	1.00		1.00	1.00
June 30	1.14						
July 7	0.10						
July 14	2.37		1.00	1.00			
July 21	0.66						
July 28	0.16						
Aug 4	0.28		1.00	1.00			
Aug 11	1.16						
Aug 18	1.02						
Aug 25	0.02						
Sept 1	0.77						
Sept 8	0.20						
Sept 15	3.19						
Sept 22	0.60						
Sept 29	0.91						
Total	16.33	1.00	3.00	4.00	1.00	1.00	2.00

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Standard error per plot. Grain:
Beans. Sub plot: 1.16 or 6.3% (24 d.f.)

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS

	O	A	B	C	Mean
KE	17.84	18.12	17.10	16.77	17.46
M	12.82	13.04	13.03	12.75	12.91
S1	16.19	16.36	15.93	15.62	16.02
S2	14.46	15.27	14.31	14.80	14.71
S3	15.35	15.12	14.94	13.86	14.82
N1	15.73	16.02	15.03	14.32	15.27
N2	15.43	15.62	15.08	14.61	15.18
N3	15.25	15.55	15.34	15.33	15.37
N4	14.92	15.13	14.80	14.78	14.91
Mean	15.33	15.58	15.06	14.76	15.18
KE S1	19.04	18.63	18.06	17.70	
KE S2	15.86	17.56	15.68	16.23	
KE S3	18.61	18.18	17.55	16.40	
M S1	13.34	14.09	13.80	13.54	
M S2	13.06	12.97	12.95	13.37	
M S3	12.08	12.06	12.33	11.33	
KE N1	17.95	18.73	16.90	15.91	
KE N2	17.82	18.12	17.12	16.47	
KE N3	18.38	18.50	17.07	17.53	
KE N4	17.21	17.15	17.29	17.18	
M N1	13.51	13.31	13.17	12.72	
M N2	13.04	13.12	13.03	12.75	
M N3	12.12	12.61	13.60	13.13	
M N4	12.63	13.11	12.31	12.37	

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POTATOES

TOTAL TUBERS

	O	A	B	C
S1 N1	17.33	16.97	15.44	15.29
S1 N2	16.02	17.08	16.64	15.20
S1 N3	16.41	15.78	15.83	16.72
S1 N4	15.00	15.61	15.81	15.27
S2 N1	13.42	16.62	14.92	14.24
S2 N2	16.02	14.11	13.73	15.37
S2 N3	14.46	14.78	13.94	14.88
S2 N4	13.93	15.56	14.66	14.71
S3 N1	16.43	14.47	14.73	13.42
S3 N2	14.25	15.67	14.86	13.27
S3 N3	14.87	16.09	16.24	14.39
S3 N4	15.83	14.23	13.95	14.36

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POTATOES

% WARE

	O	A	B	C	Mean
KE	96.0	96.6	96.0	96.1	96.2
M	97.3	97.2	97.1	97.3	97.2
S1	95.9	96.3	95.9	96.2	96.1
S2	96.6	97.1	96.6	96.8	96.8
S3	97.4	97.3	97.0	96.9	97.2
N1	96.9	96.8	96.3	96.8	96.7
N2	96.8	97.3	96.6	96.3	96.7
N3	96.6	96.9	96.3	96.7	96.6
N4	96.2	96.6	96.9	96.9	96.7
Mean	96.6	96.9	96.5	96.7	96.7
KE S1	95.1	95.8	95.1	95.4	
KE S2	95.8	96.8	95.9	96.2	
KE S3	97.1	97.2	97.0	96.6	
M S1	96.6	96.8	96.7	97.1	
M S2	97.4	97.4	97.3	97.5	
M S3	97.7	97.4	97.1	97.2	
KE N1	96.4	96.3	95.8	96.4	
KE N2	96.0	97.2	95.8	95.1	
KE N3	95.8	97.0	95.9	96.3	
KE N4	95.7	95.9	96.4	96.5	
M N1	97.4	97.4	96.8	97.2	
M N2	97.5	97.4	97.4	97.5	
M N3	97.3	96.8	96.6	97.1	
M N4	96.8	97.3	97.4	97.3	

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POTATOES

% WARE

	O	A	B	C	Mean
S1 N1	96.1	96.4	95.3	96.5	
S1 N2	96.1	96.7	96.3	95.5	
S1 N3	96.6	96.6	95.7	96.6	
S1 N4	94.6	95.5	96.3	96.3	
S2 N1	96.6	97.2	96.0	97.0	
S2 N2	97.1	97.5	97.2	96.6	
S2 N3	95.9	96.5	95.9	96.6	
S2 N4	96.9	97.0	97.3	97.1	
S3 N1	97.9	96.9	97.6	96.9	
S3 N2	97.2	97.6	96.4	96.7	
S3 N3	97.4	97.5	97.2	96.9	
S3 N4	97.2	97.3	97.0	97.3	

SPRING BEANS

GRAIN

(0.82)*

(±0.41)

O	20.1	19.5	17.5	17.1	18.6
DG	19.7	17.4	18.2	17.8	18.3
DGE	18.3	19.8	19.5	17.2	18.7
PG	19.1	17.4	19.1	16.9	18.1
PGE	21.2	18.9	19.8	19.0	19.7
MS	18.7	17.7	17.8	16.4	17.7
RS	18.3	17.1	18.0	15.5	17.2
Mean	19.4	18.3	18.6	17.1	18.3

Mean D.M. %: 75.4

* For use in vertical and interaction comparisons only