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65/R/IR/C/14 Irrigation - Potatoes and Spring Beans

Rothamsted Research

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65/C/14.1

IRRIGATION

(IR)

The effect of irrigation on potatoes and spring beans - Great Field I and II 1965.

Design:

Potatoes: A single replicate of 4 x 2 x 3 x 2 x 2 in two blocks. Each block is divided into 4 whole plots for the irrigation treatments, and at right angles into 6 strips for varieties and spacing. There is a further split for chitting and N.
Spring beans: 4 x 2 x 2 x 2 x 2 in two blocks. Each block is divided into 4 whole plots for irrigation, these being divided into 8 sub-plots.

Area of each sub-plot:-

Potatoes: 0.0204. Area harvested: 0.0080.
Spring beans: 0.0321. Area harvested: 0.0210.

Treatments: potatoes: All combinations:-

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

To strips of 1/6th plots.

2. Varieties: Majestic (M), King Edward (E).

3. Spacing: Seed 12 (S1), 15 (S2), 18 inches (S3) apart in row.

1/12th plots. 4. Chitting: None (O), seed chitted (Ch).

5. Nitrogen: 0.75 (N1), 1.5 (N2) cwt N as 'Nitro-Chalk'.

Spring beans: All combinations of:-

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

Sub-plots. 2. Row spacing: 10.5 (C), 21 inches (W).

3. Seed rate: 200 (L), 300 lb (H).

4. Rates of PK: 400 (F1), 560 lb (F2) (0:20:20).

5. Methods of applying fertiliser: Broadcast (B), placed (P).

Basal applications:

Potatoes: 2.0 cwt P2O5, 4.0 cwt K2O as (0:14:28) rotary cultivated in. Weedkiller: Paraquat at 0.75 lb ion plus linuron at 2 lb in 40 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on 3 occasions.

Spring beans: Manures: None. Weedkiller: Simazine at 1 lb in 40 gals. Insecticide: Menazon at 4 oz in 40 gals.

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Cultivations, etc.:

Potatoes: Ploughed: Dec 21 - Feb 17, 1964. Basal PK compound applied: Apr 8, 1965. 'Nitro-Chalk' applied: Apr 12. Rotary cultivated, potatoes planted: Apr 15. Sprayed, weed-killer: May 13, fungicide: June 30, July 27, Aug 10. Sprayed with undiluted BCV at 15 gals: Aug 27. Lifted: Oct 21. Previous crops: Barley 1963 and 1964.

Spring beans: Ploughed: Feb 17, 1965. Seed placement drilled for C treatment: Mar 16. Fertiliser broadcast for C treatment: Mar 17. Seed placement drilled and fertiliser broadcast for W treatment: Mar 25. Sprayed, weedkiller: Mar 29, insecticide: June 11. Combine harvested: Oct 6. Variety: Garton's Pedigree Tick. Previous crops: Barley 1963 and 1964.

RAINFALL AND IRRIGATION: INCHES

Week-ending	Rain	Potatoes A and C	Beans A and C
6 May	0.78		
13	0.10		
20	0.52		
27	0.48		
3 June	0.14		0.50
10	0.68		
17	0.94		
24	0.69		
1 July	0.07		
8	0.33	1.00	
15	1.33		
22	0.84		
29	1.58		
5 Aug	0.70		
12	0.03		
19	0.37		
26	0.76		
2 Sept	0.25		
Total	10.59	1.00	0.50

Standard errors per plot.

Potatoes, total tubers:	Pooled whole & strip:	1.017 or 6.4% (9 d.f.)
	1/6 plot:	0.639 or 4.0% (21 d.f.)
	1/12 plot:	1.386 or 8.7% (28 d.f.)
Spring beans, grain:	Whole plot:	0.70 or 2.5% (5 d.f.)
	Sub plot:	2.12 or 7.6% (23 d.f.)

65/c/14.3

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS

	O & B		A & C	Mean
Mean	16.39	(±0.415)	15.55	15.97
M	16.26	(1) and (2)	15.88	(±0.415) 16.07
E	16.53		15.22	15.87
S1	16.68	(3) and (4)	16.42	(±0.519) 16.55
S2	16.32		14.93	15.62
S3	16.18		15.31	15.74
O	16.10	(5) and (6)	14.49	(±0.200) 15.29
CH	16.69		16.61	16.65
N1	16.60	(5) and (6)	15.50	(±0.200) 16.05
N2	16.19		15.61	15.90

- (1) (±0.184) (3) (±0.226) For use in interaction comparisons only
 (2) (±0.435) (4) (±0.533) For use in all other comparisons
 (5) (±0.461) For use in horizontal and diagonal comparisons
 (6) (±0.283) For use in vertical and interaction comparisons

65/c/14.4

POTATOES

TOTAL TUBERS

	MS1	MS2	MS3	ES1	ES2	ES3
O & B	16.18	16.76	15.84	17.19	15.87	16.52
A & C	16.60	15.63	15.42	16.25	14.22	15.19
	MO	MCH	EO	ECH		
O & B	16.06	16.46	16.14	16.91		
A & C	14.64	17.12	14.34	16.10		
	MN1	MN2	EN1	EN2		
O & B	16.43	16.08	16.76	16.29		
A & C	15.69	16.07	15.30	15.14		
	S10	S1CH	S20	S2CH	S30	S3CH
O & B	16.53	16.84	16.05	16.59	15.72	16.64
A & C	15.50	17.35	14.22	15.64	13.76	16.86
	S1N1	S1N2	S2N1	S2N2	S3N1	S3N2
O & B	16.53	16.84	17.12	15.52	16.16	16.20
A & C	16.24	16.61	15.38	14.47	14.87	15.74
	ON1	ON2	CHN1	CHN2		
O & B	16.43	15.77	16.77	16.60		
A & C	14.51	14.47	16.48	16.74		

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POTATOES

% WARE

	O & B	A & C	Mean
Mean	97.0	96.4	96.7
M	97.4	97.0	97.2
E	96.7	95.8	96.2
S1	96.8	96.1	96.5
S2	96.8	96.3	96.5
S3	97.5	96.8	97.1
O	96.7	95.6	96.2
CH	97.4	97.1	97.3
N1	97.1	96.3	96.7
N2	97.0	96.4	96.7

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		POTATOES					
		% WARE					
		MS1	MS2	MS3	ES1	ES2	ES3
O & B		96.9	97.3	97.9	96.7	96.3	97.2
A & C		96.9	96.7	97.4	95.3	95.8	96.1
		MO	MCH	EO	ECH		
O & B		97.4	97.4	96.0	97.4		
A & C		96.9	97.1	94.4	97.1		
		MN1	MN2	EN1	EN2		
O & B		97.4	97.4	96.7	96.7		
A & C		97.0	97.0	95.6	95.9		
		S10	S1CH	S20	S2CH	S30	S3CH
O & B		96.7	96.9	96.2	97.4	97.2	97.8
A & C		95.3	97.0	95.7	96.8	95.9	97.6
		S1N1	S1N2	S2N1	S2N2	S3N1	S3N2
O & B		96.7	96.9	96.8	96.8	97.6	97.4
A & C		95.9	96.3	96.3	96.3	96.9	96.7
		ON1	ON2	CHN1	CHN2		
O & B		96.8	96.6	97.3	97.5		
A & C		95.5	95.7	97.1	97.1		

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SPRING BEANS

GRAIN

	O & B		A & C	Mean
Mean	28.8	(±0.35)	27.4	28.1
C	29.8	(1) and (2)	28.2	(±0.37) 29.0
W	27.8		26.6	27.2
L	29.4	(1) and (2)	28.0	(±0.37) 28.7
H	28.2		26.8	27.5
F1	28.9	(1) and (2)	26.7	(±0.37) 27.8
F2	28.6		28.0	28.4
B	29.8	(1) and (2)	28.2	(±0.37) 28.9
P	27.8		26.6	27.2

(1) (±0.51) For use in horizontal and diagonal comparisons

(2) (±0.53) For use in vertical and diagonal comparisons

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SPRING BEANS

GRAIN

	CL	WL	CH	WH
		(3) and (4)		
O & B	30.3	28.4	29.4	27.0
A & C	28.8	27.2	27.6	25.9
	CF1	WF1	CF2	WF2
		(3) and (4)		
O & B	29.6	28.1	30.0	27.4
A & C	26.8	26.6	29.6	26.6
	CB	WB	CP	WP
		(3) and (4)		
O & B	30.4	29.1	29.2	26.4
A & C	28.6	27.6	27.8	25.5
	IF1	HF1	IF2	HF2
		(3) and (4)		
O & B	29.8	28.0	28.8	28.4
A & C	27.2	26.2	28.8	27.4
	LB	HB	LP	HP
		(3) and (4)		
O & B	30.8	28.8	27.9	27.7
A & C	28.6	27.7	27.4	25.8

(3) (± 0.72) For use in vertical and diagonal comparisons
 (4) (± 0.75) For use in horizontal and interaction comparisons

65/c/14.9

SPRING BEANS

GRAIN

	F1B	F2B	F1P	F2P
D & B	30.0	29.5	27.8	27.8
A & C	27.8	28.5	25.6	27.6

(3) (± 0.72) For use in vertical and diagonal comparisons

(4) (± 0.75) For use in horizontal and interaction comparisons