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Yields of the Field Experiments 1973

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73/R/RN/11 - Irrigation - Potatoes

Rothamsted Research

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73/R/RN/11

IRRIGATION

Object: To study the effects of irrigation on a rotation of crops. Other agronomic factors are included from time to time - Great Field I and II.

Sponsors: B.J. Legg, B.K. French.

The tenth year, fallow (Gt. Field I), potatoes (Gt. Field II).

For previous years see 64/C/15(t), 65/C/14(t), 66/C/9(t), 67/C/7(t), 68/C/6(t), 69/R/RN/11(t), 70/R/RN/11(t), 71/R/RN/11(t) and 72/R/RN/11(t).

Design: 4 randomised blocks of 4 plots, split into half and quarter plots.

Treatments: All combinations of:-

Whole plots: 1. Irrigation	IRRIGN
None	None
Full	Full
2. Plant population	POPULATN
Normal, 71 cm between rows, 38 cm between plants in rows	Normal
Quarter normal, 142 cm between rows, 76 cm between plants in rows	Quarter
Half plots: 3. Chitting and planting dates	CHITTING
Chitted seed, planted early	CH/Early
Unchitted seed, planted late	C/Late
Quarter plots: 4. Nitrogen fertiliser (kg N)	N
163 in basal (13:13:20)	163
163 in basal (13:13:20) + 163 as 'Nitro-Chalk'	326

Whole plot dimensions: 30.5 x 30.5. Sub plot area harvested: 0.00303.

Standard applications:-

Potatoes: Manures: (13:13:20) at 1300 kg, supplying the first rate of N.

Weedkillers: Linuron at 1.1 kg and paraquat at 0.31 kg ion in 450 l.

Fungicide: Mancozeb at 1.3 kg in 370 l on 3 occasions. Insecticide:

Demeton-s-methyl at 0.25 kg applied with the mancozeb on the first occasion.

Seed: King Edward, Rothamsted, once grown.

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Cultivations, etc.:

Fallow: Ploughed: 1 Feb, 1973. Rotary cultivated 3 times: 26 Apr, 25 May, 2 July. Deep-tine cultivated: 28 July.

Potatoes: Ploughed: 8 Nov, 1972. Basal NPK and test N applied for first planting: 29 Mar, 1973. Plots rotary cultivated, seed planted (first planting): 30 Mar. Basal NPK and test N applied, rotary cultivated, seed planted (second planting): 2 May. Weedkiller applied to first planting: 5 May. Weedkiller applied to second planting: 18 May. Early planting grubbed and rotary ridged: 11 June. Late planting rotary ridged: 3 July. Sprayed with fungicide and insecticide: 3 July. Sprayed with fungicide: 24 July and 10 Aug. Haulm destroyed mechanically, sprayed with undiluted BOV at 220 l: 31 Aug. Lifted: 9 Oct.

Standard errors per plot. Total tubers: tonnes/hectare.

Whole plot: 3.02 or 10.4% (9 d.f.)
Sub plot: 2.23 or 7.7% (12 d.f.)
Quarter plot: 2.56 or 8.8% (24 d.f.)

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RAINFALL AND IRRIGATION: MM

Week ending	RAINFALL	IRRIGATION TO potatoes (Early and Late)
May 5	21.5	
May 12	13.5	
May 19	9.0	
May 26	12.0	
June 2	7.1	
June 9	TR	
June 14	-	25.0
June 16	0.0	
June 18	-	25.0
June 23	37.8	
June 30	43.9	
July 7	33.5	
July 14	0.5	
July 21	20.6	
July 28	TR	
July 30	-	25.0
Aug 4	6.3	
Aug 11	24.1	
Aug 18	0.0	
Aug 25	TR	
Sept 1	11.4	
Sept 8	TR	
Sept 15	3.1	
Sept 22	40.8	
Sept 29	19.2	
Total	304.3	75.0

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TABLES OF MEANS

TOTAL TUBERS: TONNES/HECTARE

	POPULATN		CHITTING		N		Mean
	Normal	Quarter	CH/Early	O/Late	163	326	
IRRIGN							
None	41.1	22.5	35.1	28.5	31.3	32.3	31.8
Full	36.2	16.4	30.2	22.4	25.1	27.5	26.3
	POPULATN						
	Normal		43.2	34.1	38.1	39.2	38.6
	Quarter		22.1	16.8	18.3	20.6	19.5
			CHITTING				
			CH/Early		32.1	33.2	32.7
			O/Late		24.3	26.6	25.4
Mean					28.2	29.9	29.1

IRRIGN	POPULATN	CHITTING		CH/Early		O/Late	
		N		163	326	163	326
None	Normal			45.5	45.5	36.5	36.9
None	Quarter			24.3	25.1	18.9	21.6
Full	Normal			41.1	40.8	29.2	33.8
Full	Quarter			17.5	21.5	12.7	14.1

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TOTAL TUBERS: TONNES/HECTARE

STANDARD ERRORS OF DIFFERENCES

IRRIGN	POPULATN	CHITTING	N	IRRIGN POPULATN	IRRIGN CHITTING	POPULATN CHITTING	IRRIGN N
1.51	1.51	0.79	0.64	2.14	1.70	1.70	1.64
	POPULATN N	CHITTING N	IRRIGN POPULATN CHITTING N				
	1.64	1.92	2.73				
Except when comparing means with same levels of							
	IRRIGN.POPULATN		2.03				
	IRRIGN.POPULATN. CHITTING		1.81				
	IRRIGN.POPULATN.N		2.03				

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PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	POPULATN		CHITTING		N		Mean
	Normal	Quarter	CH/Early	O/Late	163	326	
IRRIGN							
None	70.5	83.1	79.4	74.1	74.8	78.7	76.8
Full	63.2	76.6	74.7	65.1	67.8	71.9	69.9
	POPULATN		CHITTING				
		Normal	71.3	62.4	63.7	70.0	66.9
		Quarter	82.8	76.8	78.9	80.7	79.8
			CHITTING				
			CH/Early	O/Late	75.2	78.9	77.1
			O/Late		67.4	71.8	69.6
Mean					71.3	75.3	73.3

IRRIGN	POPULATN	CHITTING		CHITTING	
		N	CH/Early	O/Late	N
		163	326	163	326
None	Normal	70.7	76.6	64.8	70.1
None	Quarter	85.6	84.9	78.3	83.4
Full	Normal	64.9	73.1	54.6	60.1
Full	Quarter	79.8	80.9	72.0	73.5