ROTHAMSTED RESEARCH

Yields of the Field Experiments 1976

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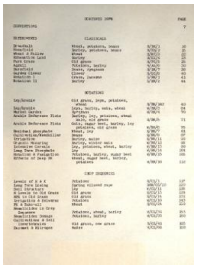

76/W/CS/16 Irrigation and Eelworms - Potatoes

Rothamsted Research

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76/W/CS/16

IRRIGATION AND EELWORMS

Object: To study the cumulative effects of dazomet (later, aldicarb) and irrigation on the yield and incidence of Globodera (formerly Heterodera) spp. on potatoes grown continuously. The effects of growing susceptible and resistant varieties are also studied, either grown continuously or alternated. The effects of enhanced farm practice are tested from 1976 - Woburn Butt Close.

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The 11th year, potatoes.

For previous years see 66/C/32(t), 67/C/25, 68/C/19, 69/W/CS/16(t), 70-71/W/CS/16, 72/W/CS/16(t) and 73-75/W/CS/16.

Design: 3 blocks of 4 plots, sequences of varieties on strips of 2 half plots, aldicarb on quarter plots, farm practice on pairs of eighth plots.

Whole plot dimensions: 14.5 x 15.2.

Treatments: All combinations of:-

Whole plots

1. IRRIGTN Irrigation:

NONE	None
FULL	Full

Strips of half plots

2. CROPSEQN Cropping sequences with potatoes resistant (R) and susceptible (S) to potato cyst nemtatode:

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
R/R/R/R	R	R	R	R	R	R	R	R	R	R	R
S/R/S/R	R	S	R	S	R	S	R	S	R	S	R
S/S/S/S	S	S	S	S	S	S	S	S	S	S	S
R/S/R/S	S	R	S	R	S	R	S	R	S	R	S

Quarter plots

3. ALDICARB Aldicarb (kg) applied cumulatively to previous dazomet treatments:

0.0	None
5.6	5.6

Pairs of eighth plots

4. FARMING Farm practice:

STANDARD	Standard.	Normal-size seed (3 cm) planted 50 cm apart in ridges 71 cm apart. Haulm destroyed mid-September
ENHANCED	Enhanced.	Ware-size seed (6 cm) planted 25 cm apart in ridges 71 cm apart. Additional N at 125 kg, as 'Nitro-Chalk' at tuber initiation. Haulm destroyed mid-October.

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NOTE: Extra sprays against blight and aphids were planned for enhanced farm practice but were omitted as unnecessary in this season.

Irrigation treatments 1976 (mm water):

7 June	25.4
16 June	25.4
23 June	25.4
2 July	25.4
9 July	25.4
14 July	25.4
28 July	25.4
9 Aug	25.4
13 Aug	25.4
25-27 Aug	50.8
8 Sept	25.4
Total	304.8

Basal applications: Manures: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 280 l. Insecticides: Pirimicarb at 0.14 kg in 450 l, demeton-s-methyl at 0.25 kg in 450 l on one occasion with fungicide. Fungicide: Mancozeb at 1.3 kg in 450 l on two occasions the first with insecticide. Haulm desiccant: Diquat at 0.59 kg ion in 280 l.

Seed: Resistant, Maris Piper. Susceptible, Pentland Crown.

Cultivations, etc.:- Ploughed: 28 Oct, 1975. Basal NPK applied: 22 Mar, 1976. Spring-tine cultivated: 23 Mar. Aldicarb applied and all plots rotary cultivated, potatoes planted: 2 Apr. Weedkillers applied: 7 May. Grubbed: 2 June. Rotary ridged: 3 June. Test N applied: 11 June. Pirimicarb applied: 18 June. Fungicide with demeton-s-methyl applied: 29 June. Fungicide applied: 30 July. Haulm mechanically destroyed on standard farm practice plots: 15 Sept. Haulm desiccant applied to enhanced farm practice plots: 12 Oct. Lifted: 4 Nov.

NOTES: (1) Soil samples were taken in spring before treatments were applied for cyst and egg counts of Globodera rostochiensis and G. pallida.
(2) Owing to water logged condition one plot was treated as missing for total tubers and six plots for percentage ware, those with treatment combinations (first named applies to both variates).

IRRIGTN	CROPSEQN	ALDICARB	FARMING
FULL	S/S/S/S	0.0	STANDARD
FULL	R/S/R/S	0.0	STANDARD
FULL	S/R/S/R	5.6	STANDARD
FULL	S/R/S/R	0.0	STANDARD
FULL	S/R/S/R	5.6	STANDARD
FULL	S/R/S/R	5.6	ENHANCED

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TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

CROPSEQN IRRIGTN	R/R/R/R	S/R/S/R	S/S/S/S	R/S/R/S	MEAN
NONE	17.7	18.4	22.0	21.6	19.9
FULL	37.2	37.4	48.8	49.8	43.3
MEAN	27.4	27.9	35.4	35.7	31.6

ALDICARB IRRIGTN	0.0	5.6	MEAN
NONE	11.4	28.4	19.9
FULL	28.8	57.8	43.3
MEAN	20.1	43.1	31.6

ALDICARB CROPSEQN	0.0	5.6	MEAN
R/R/R/R	18.2	36.6	27.4
S/R/S/R	19.5	36.3	27.9
S/S/S/S	21.7	49.1	35.4
R/S/R/S	21.0	50.4	35.7
MEAN	20.1	43.1	31.6

FARMING IRRIGTN	STANDARD	ENHANCED	MEAN
NONE	16.5	23.4	19.9
FULL	35.2	51.4	43.3
MEAN	25.8	37.4	31.6

FARMING CROPSEQN	STANDARD	ENHANCED	MEAN
R/R/R/R	21.9	33.0	27.4
S/R/S/R	23.2	32.7	27.9
S/S/S/S	28.6	42.2	35.4
R/S/R/S	29.6	41.7	35.7
MEAN	25.8	37.4	31.6

FARMING ALDICARB	STANDARD	ENHANCED	MEAN
0.0	16.1	24.1	20.1
5.6	35.6	50.6	43.1
MEAN	25.8	37.4	31.6

IRRIGTN	ALDICARB CROPSEQN	0.0	5.6
NONE	R/R/R/R	10.9	24.4
	S/R/S/R	13.0	23.9
	S/S/S/S	10.5	33.5
	R/S/R/S	11.2	31.9
FULL	R/R/R/R	25.5	48.8
	S/R/S/R	26.1	48.7
	S/S/S/S	32.9	64.7
	R/S/R/S	30.8	68.9

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TOTAL TUBERS TONNES/HECTARE

IRRIGTN	FARMING CROPSEQN	STANDARD	ENHANCED
NONE	R/R/R/R	13.4	21.9
	S/R/S/R	15.8	21.0
	S/S/S/S	18.3	25.6
	R/S/R/S	18.3	24.8
FULL	R/R/R/R	30.3	44.0
	S/R/S/R	30.5	44.3
	S/S/S/S	38.8	58.8
	R/S/R/S	41.0	58.6

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN				
NONE	10.1	12.7	22.8	34.0
FULL	22.0	35.6	48.3	67.3

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
CROPSEQN				
R/R/R/R	14.9	21.5	28.9	44.4
S/R/S/R	16.6	22.4	29.7	42.9
S/S/S/S	15.1	28.4	42.1	56.0
R/S/R/S	17.7	24.3	41.6	59.2

	ALDICARB	0.0		5.6	
	FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN	CROPSEQN				
NONE	R/R/R/R	8.0	13.8	18.9	30.0
	S/R/S/R	11.9	14.0	19.7	28.1
	S/S/S/S	9.6	11.4	27.0	39.9
	R/S/R/S	10.9	11.5	25.6	38.1
FULL	R/R/R/R	21.8	29.3	38.9	58.8
	S/R/S/R	21.4	30.8	39.6	57.8
	S/S/S/S	20.5	45.4	57.2	72.2
	R/S/R/S	24.5	37.0	57.5	80.3

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TOTAL TUBERS TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	IRRIGTN	CROPSEQN	ALDICARB	FARMING
SED	1.78	2.52	1.42	1.35

TABLE	IRRIGTN CROPSEQN	IRRIGTN ALDICARB	CROPSEQN ALDICARB	IRRIGTN FARMING
SED	3.57	2.28	3.23	2.24
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
IRRIGTN		2.01		1.90
CROPSEQN			2.85	

TABLE	CROPSEQN FARMING	ALDICARB FARMING	IRRIGTN CROPSEQN ALDICARB	IRRIGTN CROPSEQN FARMING
SED	3.16	1.96	4.57	4.47
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROPSEQN	2.69			
ALDICARB		1.57		
FARMING		1.64		
IRRIGTN.CROPSEQN			4.03	3.81

TABLE	IRRIGTN ALDICARB FARMING	CROPSEQN ALDICARB FARMING	IRRIGTN CROPSEQN ALDICARB FARMING
SED	2.77	3.92	5.54
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
IRRIGTN.ALDICARB	2.22		
CROPSEQN.ALDICARB		3.14	
IRRIGTN.FARMING	2.32		
CROPSEQN.FARMING		3.28	
IRRIGTN.CROPSEQN.ALDICARB			4.45
IRRIGTN.CROPSEQN.FARMING			4.64

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.ROW.HP	14	4.37	13.8
BLOCK.ROW.HP.QP	16	4.93	15.6
BLOCK.ROW.HP.EP	16	4.66	14.8
BLOCK.ROW.HP.QP.EP	15	3.98	12.6

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PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

CROPSEQN IRRIGTN	R/R/R/R	S/R/S/R	S/S/S/S	R/S/R/S	MEAN
NONE	57.5	71.5	82.2	76.4	71.9
FULL	83.4	89.3	92.7	91.3	89.2
MEAN	70.5	80.4	87.5	83.8	80.5

ALDICARB IRRIGTN	0.0	5.6	MEAN
NONE	61.7	82.1	71.9
FULL	86.4	92.0	89.2
MEAN	74.0	87.0	80.5

ALDICARB CROPSEQN	0.0	5.6	MEAN
R/R/R/R	58.7	82.2	70.5
S/R/S/R	77.3	83.5	80.4
S/S/S/S	83.6	91.3	87.5
R/S/R/S	76.5	91.2	83.8
MEAN	74.0	87.0	80.5

FARMING IRRIGTN	STANDARD	ENHANCED	MEAN
NONE	75.1	68.7	71.9
FULL	90.4	87.9	89.2
MEAN	82.8	78.3	80.5

FARMING CROPSEQN	STANDARD	ENHANCED	MEAN
R/R/R/R	71.4	69.5	70.5
S/R/S/R	84.8	76.1	80.4
S/S/S/S	89.2	85.7	87.5
R/S/R/S	85.7	82.0	83.8
MEAN	82.8	78.3	80.5

FARMING ALDICARB	STANDARD	ENHANCED	MEAN
0.0	77.0	71.1	74.0
5.6	88.5	85.6	87.0
MEAN	82.8	78.3	80.5

	ALDICARB	0.0	5.6
IRRIGTN	CROPSEQN		
NONE	R/R/R/R	38.5	76.6
	S/R/S/R	68.6	74.5
	S/S/S/S	74.7	89.7
	R/S/R/S	65.1	87.7
FULL	R/R/R/R	78.9	87.9
	S/R/S/R	86.1	92.5
	S/S/S/S	92.5	92.9
	R/S/R/S	87.9	94.6

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PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

IRRIGTN	FARMING CROPSEQN	STANDARD	ENHANCED
NONE	R/R/R/R	56.6	58.5
	S/R/S/R	78.6	64.4
	S/S/S/S	85.0	79.4
	R/S/R/S	80.1	72.7
FULL	R/R/R/R	86.2	80.6
	S/R/S/R	90.9	87.8
	S/S/S/S	93.4	92.0
	R/S/R/S	91.2	91.3

ALDICARB	0.0		5.6	
FARMING IRRIGTN	STANDARD	ENHANCED	STANDARD	ENHANCED
NONE	65.8	57.6	84.4	79.9
FULL	88.2	84.5	92.7	91.3

ALDICARB	0.0		5.6	
FARMING CROPSEQN	STANDARD	ENHANCED	STANDARD	ENHANCED
R/R/R/R	57.9	59.6	84.9	79.5
S/R/S/R	83.2	71.5	86.3	80.7
S/S/S/S	86.8	80.4	91.6	91.0
R/S/R/S	80.2	72.8	91.2	91.1

	ALDICARB	0.0		5.6	
IRRIGTN	FARMING CROPSEQN	STANDARD	ENHANCED	STANDARD	ENHANCED
NONE	R/R/R/R	32.0	45.0	81.1	72.0
	S/R/S/R	78.1	59.0	79.1	69.9
	S/S/S/S	80.3	69.2	89.8	89.6
	R/S/R/S	72.8	57.3	87.4	88.0
FULL	R/R/R/R	83.7	74.1	88.8	87.0
	S/R/S/R	88.3	84.0	93.5	91.5
	S/S/S/S	93.4	91.6	93.5	92.3
	R/S/R/S	87.5	88.3	94.9	94.3

EIGHTH PLOT AREA HARVESTED 0.00092

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