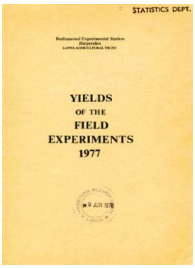
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1977

Full Table of Content



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

Rothamsted Research

Rothamsted Research (1978) *77/W/CS/16 Irrigation and Eelworms - Potatoes ;* Yields Of The Field Experiments 1977, pp 132 - 138 **- DOI: https://doi.org/10.23637/ERADOC-1-29**

77/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 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 have been tested since 1976 - Woburn Butt Close.

Sponsors: D.M. Parrott, F.G.W. Jones.

The 12th 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 73-76/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 by trickle lines:

NONE	None
FULL	Full (138 mm)

Strips of half plots

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

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
R/R/R/R	R	R	R	R	R	R	R	R	R	R	R	R
R/S/R/S	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	S	S
S/R/S/R	S	R	S	R	S	R	S	R	S	R	S	R

Quarter plots

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

0.0
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 not destroyed.

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

NOTE: Mixed seed was accidentally planted on plots intended for the resistant (R) variety, Maris Piper. These plots only were lifted two weeks after planting, appropriate plots retreated with aldicarb and new seed of Maris Piper planted.

Irrigation treatments 1977 (mm water):

8 July	12.5
11 July	12.5
15 July	12.5
19 July	12.5
20 July	12.5
21 July	12.5
25 July	12.5
27 July	12.5
29 July	12.5
1 Aug	12.5
5 Aug	12.5
Total	137.5

Basal applications: Manures: (13:13:20) at 1860 kg. Weedkiller: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 420 l. Fungicide: Mancozeb at 1.3 kg on four occasions, the last three with insecticide, in 420 l, 340 l and twice in 430 l successively. Insecticide: Pirimicarb at 0.14 kg on three occasions, with fungicide.

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

Cultivations, etc.:- Heavy-tine cultivated: 22 Nov, 1976. Ploughed: 17 Feb, 1977. NPK applied: 5 Apr. Spring-tine cultivated with crumbler attached: 18 Apr. Aldicarb applied, and these plots only rotary cultivated, potatoes planted: 21 Apr. Grubbed: 2 May. Maris Piper plots lifted: 6 May. Maris Piper plots only rotary cultivated, aldicarb treatments re-applied, and these plots only rotary cultivated: 9 May. Maris Piper replanted, fine tooth harrowed: 10 May. Fine tooth harrowed and grubbed Pentland Crown plots: 25 May. Earthed up Pentland Crown plots only, weedkiller applied to all plots: 26 May. Fungicide applied, grubbed Maris Piper plots only: 28 June. Ridged up Maris Piper plots only: 1 July. N treatment applied: 4 July. Fungicide with insecticide applied: 13 July, 11 Aug, 1 Sept. Haulm mechanically destroyed on standard practice plots only: 19 Sept. Lifted: 28 Oct.

NOTE: Soil samples were taken in spring before treatments were applied for cyst and egg counts of Globodera rostochiensis and G. pallida.

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

TOTAL TUBERS TONNES/HECTARE

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

CROPSEQN IRRIGTN	R/R/R/R	R/S/R/S	S/S/S/S	S/R/S/R	MEAN
NONE	12.7	20.3	22.0	13.0	17.0
FULL	17.2	24.1	27.8	12.8	20.5
MEAN	14.9	22.2	24.9	12.9	18.7

ALDICARB IRRIGTN	0.0	5.6	MEAN
NONE	12.2	21.8	17.0
FULL	13.6	27.3	20.5
MEAN	12.9	24.6	18.7

ALDICARB CROPSEQN	0.0	5.6	MEAN
R/R/R/R	13.2	16.6	14.9
R/S/R/S	16.6	27.8	22.2
S/S/S/S	12.5	37.2	24.9
S/R/S/R	9.3	16.5	12.9
MEAN	12.9	24.6	18.7

FARMING IRRIGTN	STANDARD	ENHANCED	MEAN
NONE	13.1	20.9	17.0
FULL	14.5	26.4	20.5
MEAN	13.8	23.7	18.7

FARMING CROPSEQN	STANDARD	ENHANCED	MEAN
R/R/R/R	10.4	19.4	14.9
R/S/R/S	16.9	27.4	22.2
S/S/S/S	19.3	30.4	24.9
S/R/S/R	8.5	17.3	12.9
MEAN	13.8	23.7	18.7

FARMING ALDICARB	STANDARD	ENHANCED	MEAN
0.0	8.8	17.0	12.9
5.6	18.8	30.3	24.6
MEAN	13.8	23.7	18.7

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

TOTAL TUBERS TONNES/HECTARE

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

	ALDICARB	0.0	5.6
IRRIGTN	CROPSEQN		
NONE	R/R/R/R	12.4	13.1
	R/S/R/S	13.7	26.8
	S/S/S/S	11.3	32.6
	S/R/S/R	11.2	14.8
FULL	R/R/R/R	14.1	20.2
	R/S/R/S	19.4	28.8
	S/S/S/S	13.7	41.8
	S/R/S/R	7.3	18.2

	FARMING	STANDARD	ENHANCED
IRRIGTN	CROPSEQN		
NONE	R/R/R/R	9.2	16.2
	R/S/R/S	16.2	24.4
	S/S/S/S	16.8	27.1
	S/R/S/R	10.1	16.0
FULL	R/R/R/R	11.7	22.6
	R/S/R/S	17.7	30.5
	S/S/S/S	21.9	33.7
	S/R/S/R	6.9	18.7

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN				
NONE	8.7	15.6	17.5	26.2
FULL	8.8	18.5	20.2	34.3

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
CROPSEQN				
R/R/R/R	8.4	18.0	12.5	20.8
R/S/R/S	11.6	21.5	22.3	33.4
S/S/S/S	9.1	15.9	29.5	44.9
S/R/S/R	5.9	12.7	11.1	22.0

	ALDICARB	0.0		5.6	
	FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN	CROPSEQN				
NONE	R/R/R/R	8.5	16.2	10.0	16.2
	R/S/R/S	9.2	18.2	23.1	30.5
	S/S/S/S	8.6	14.0	25.0	40.2
	S/R/S/R	8.5	13.9	11.7	18.0
FULL	R/R/R/R	8.4	19.8	14.9	25.5
	R/S/R/S	14.0	24.8	21.4	36.2
	S/S/S/S	9.7	17.8	34.1	49.6
	S/R/S/R	3.2	11.5	10.5	26.0

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

TOTAL TUBERS TONNES/HECTARE

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

TABLE	IRRIGTN	CROPSEQN	ALDICARB	FARMING
SED	1.65	2.34	1.59	1.03

TABLE	IRRIGTN CROPSEQN	IRRIGTN ALDICARB	CROPSEQN ALDICARB	IRRIGTN FARMING
SED	3.30	2.29	3.24	1.95
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
IRRIGTN		2.24		1.45
CROPSEQN			3.17	

TABLE	CROPSEQN FARMING	ALDICARB FARMING	IRRIGTN CROPSEQN ALDICARB	IRRIGTN CROPSEQN FARMING
SED	2.75	1.89	4.58	3.89
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROPSEQN	2.05			
ALDICARB		1.25		
FARMING		1.74		
IRRIGTN.CROPSEQN			4.49	2.90

TABLE	IRRIGTN ALDICARB FARMING	CROPSEQN ALDICARB FARMING	IRRIGTN CROPSEQN ALDICARB FARMING
SED	2.61	3.69	5.22
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
IRRIGTN	2.67		
CROPSEQN		3.78	
IRRIGTN.CROPSEQN			5.34
IRRIGTN.ALDICARB	1.77		
CROPSEQN.ALDICARB		2.51	
IRRIGTN.FARMING	2.46		
CROPSEQN.FARMING		3.48	
IRRIGTN.CROPSEQN.ALDICARB			3.55
IRRIGTN.CROPSEQN.FARMING			4.93

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

STRATUM	DF	SE	CV%
BLOCK.ROW.HP	14	4.05	21.6
BLOCK.ROW.HP.QP	16	5.49	29.3
BLOCK.ROW.HP.EP	16	3.56	19.0
BLOCK.ROW.HP.QP.EP	16	3.53	18.9

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

PERCENTAGE WARE 3.81 CM(1.5 INCH) RIDDLE

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

CROPSEQN IRRIGTN	R/R/R/R	R/S/R/S	S/S/S/S	S/R/S/R	MEAN
NONE	74.3	82.3	82.7	80.9	80.0
FULL	87.1	89.2	88.5	77.1	85.5
MEAN	80.7	85.7	85.6	79.0	82.8

ALDICARB IRRIGTN	0.0	5.6	MEAN
NONE	76.1	84.0	80.0
FULL	80.7	90.3	85.5
MEAN	78.4	87.1	82.8

ALDICARB CROPSEQN	0.0	5.6	MEAN
R/R/R/R	78.0	83.4	80.7
R/S/R/S	82.3	89.2	85.7
S/S/S/S	80.8	90.3	85.6
S/R/S/R	72.5	85.5	79.0
MEAN	78.4	87.1	82.8

FARMING IRRIGTN	STANDARD	ENHANCED	MEAN
NONE	84.7	75.4	80.0
FULL	85.5	85.5	85.5
MEAN	85.1	80.4	82.8

FARMING CROPSEQN	STANDARD	ENHANCED	MEAN
R/R/R/R	83.3	78.2	80.7
R/S/R/S	89.6	81.9	85.7
S/S/S/S	88.3	82.8	85.6
S/R/S/R	79.2	78.9	79.0
MEAN	85.1	80.4	82.8

https://doi.org/10.23637/ERADOC-1-29

77/W/CS/16

PERCENTAGE WARE 3.81 CM(1.5 INCH) RIDDLE

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

FARMING	STANDARD	ENHANCED	MEAN
ALDICARB			
0.0	80.9	75.9	78.4
5.6	89.3	84.9	87.1
MEAN	85.1	80.4	82.8

	ALDICARB	0.0	5.6
IRRIGTN	CROPSEQN		
NONE	R/R/R/R	71.5	77.1
	R/S/R/S	76.7	87.8
	S/S/S/S	77.7	87.6
	S/R/S/R	78.6	83.3
FULL	R/R/R/R	84.4	89.7
	R/S/R/S	87.8	90.6
	S/S/S/S	83.9	93.1
	S/R/S/R	66.5	87.7

	FARMING	STANDARD	ENHANCED
IRRIGTN	CROPSEQN		
NONE	R/R/R/R	78.7	69.9
	R/S/R/S	88.2	76.4
	S/S/S/S	85.8	79.5
	S/R/S/R	86.2	75.7
FULL	R/R/R/R	87.8	86.4
	R/S/R/S	91.1	87.3
	S/S/S/S	90.8	86.1
	S/R/S/R	72.2	82.1

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN				
NONE	83.0	69.3	86.5	81.4
FULL	78.8	82.5	92.1	88.4

ALDICARB	0.0		5.6	
FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
CROPSEQN				
R/R/R/R	81.2	74.8	85.3	81.5
R/S/R/S	87.0	77.5	92.2	86.2
S/S/S/S	84.6	77.0	92.1	88.6
S/R/S/R	70.8	74.3	87.5	83.4

	ALDICARB	0.0		5.6	
	FARMING	STANDARD	ENHANCED	STANDARD	ENHANCED
IRRIGTN	CROPSEQN				
NONE	R/R/R/R	79.2	63.9	78.3	76.0
	R/S/R/S	84.3	69.1	92.0	83.7
	S/S/S/S	82.9	72.6	88.8	86.4
	S/R/S/R	85.5	71.6	86.8	79.7
FULL	R/R/R/R	83.3	85.6	92.3	87.1
	R/S/R/S	89.7	85.9	92.5	88.7
	S/S/S/S	86.2	81.5	95.4	90.8
	S/R/S/R	56.1	77.0	88.3	87.1

EIGHTH PLOT AREA HARVESTED 0.00092

https://doi.org/10.23637/ERADOC-1-29