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77/W/CS/159 Methods of Incorporating Nematicides - Potatoes

Rothamsted Research

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77/W/CS/159

METHODS OF INCORPORATING NEMATICIDES

Object: To study the effects of several methods of incorporating nematicides into the soil on the incidence of *Globodera rostochiensis* and on the yield of potatoes - Woburn Butt Close I.

Sponsors: A.G. Whitehead, R.H. Bromilow.

The fourth year, potatoes.

For previous years see 74/W/P/3 and 75-76/W/CS/159.

Design: 2 randomised blocks of 2 plots split into 16.

Whole plot dimensions: 2.84 x 9.14.

Treatments: All combinations of:-

Whole plots

1. IRRIGTN	Irrigation:
NONE	None
FULL	Full (137.5 mm)

Sub plots

2. OXAMYL	Oxamyl nematicide (kg) (ignoring previous nematicide treatments):
4.5	
9.0	
3. METHOD	Method of applying oxamyl:
S/RV	To surface of soil, rotary cultivated in
W/RR	Injected through tines set 25 cm apart, cultivated by 'Roterra' (a rotary cultivator with blades revolving around a vertical axis)
C+W/RR	Injected, half through tines set 12.5 cm apart, half through tines set 25 cm apart, cultivated by 'Roterra'
S+C+W/RR	One third applied to surface of soil, one third injected through tines set 12.5 cm apart, one third injected through tines set 25 cm apart, cultivated by 'Roterra'

plus eight extra treatments on sub-plots:-

EXTRA	These treatments ignore previous nematicide treatments except as stated:
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None in 1977:

NONE- RR	None in previous years, cultivated by 'Roterra'
NONE+ RR	Given nematicides in previous years, cultivated by 'Roterra'
NONE+ RV	Given nematicides in previous years, rotary cultivated

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Oxamyl (kg) to soil surface, rotary cultivated in:

OX 2S RV	2.25
OX 7S RV	6.70

Aldicarb (kg) to soil surface, rotary cultivated in:

AL 2S RV	2.25
AL 4S RV	4.50
AL 9S RV	9.00

Irrigation treatments 1977 (mm water):

12 July	12.5
14 July	12.5
18 July	25.0
19 July	12.5
21 July	12.5
26 July	12.5
28 July	25.0
1 Aug	12.5
5 Aug	12.5
Total	137.5

Basal applications: Manures: (13:13:20) at 1860 kg. Fungicide: Mancozeb at 1.3 kg on four occasions, the last three with insecticide, in 420 l, 390 l and twice in 370 l successively. Insecticide: Pirimicarb at 0.14 kg on three occasions with fungicide.

Seed: 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. Treatments applied: 19-21 Apr. Potatoes planted: 21 Apr. Grubbed: 2 May. Fungicide applied: 24 June, 8 July, 21 July, 12 Aug. Insecticide applied: 8 July, 21 July, 12 Aug. Hand weeded: 26 Aug. Haulm mechanically destroyed: 21 Sept. Lifted: 3-4 Oct.

NOTES: (1) Soil samples were taken in spring before treatments were applied and and after harvest in autumn for cyst and egg counts of *Globodera rostochiensis* and *G. pallida*.

(2) One plot with treatment combinations

IRRIGTN FULL
EXTRA AL 2S RV

did not receive the correct treatments over the whole of the area harvested. An estimated value was used in the analysis.

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TOTAL TUBERS TONNES/HECTARE

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

OXAMYL	4.5	9.0	MEAN		
IRRIGTN					
NONE	25.4	27.8	26.6		
FULL	38.7	39.7	39.2		
MEAN	32.0	33.7	32.9		
METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR	MEAN
IRRIGTN					
NONE	25.4	23.3	29.7	27.9	26.6
FULL	40.0	39.7	36.6	40.3	39.2
MEAN	32.7	31.5	33.2	34.1	32.9
METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR	MEAN
OXAMYL					
4.5	29.2	32.6	32.4	34.0	32.0
9.0	36.2	30.4	34.0	34.2	33.7
MEAN	32.7	31.5	33.2	34.1	32.9
IRRIGTN	METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR
NONE	OXAMYL				
	4.5	24.9	22.3	26.9	27.5
	9.0	25.9	24.2	32.6	28.4
FULL	4.5	33.4	42.8	37.8	40.6
	9.0	46.5	36.7	35.4	40.1
IRRIGTN	NONE	FULL	MEAN		
EXTRA					
NONE- RR	7.5	19.9	13.7		
NONE+ RR	14.1	27.0	20.5		
NONE+ RV	12.1	37.8	25.0		
OX 2S RV	30.1	44.4	37.3		
OX 7S RV	28.0	42.9	35.4		
AL 2S RV	22.6	40.1	31.4		
AL 4S RV	27.8	43.7	35.7		
AL 9S RV	27.6	39.8	33.7		
MEAN	21.2	37.0	29.1		

GRAND MEAN 31.0

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

TABLE	EXTRA	OXAMYL	METHOD	IRRIGTN* EXTRA
SED	3.53	1.77	2.50	4.99
TABLE	IRRIGTN* OXAMYL	IRRIGTN* METHOD	OXAMYL METHOD	IRRIGTN* OXAMYL METHOD
SED	2.50	3.53	3.53	4.99

*WITHIN THE SAME LEVEL OF IRRIGTN

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TOTAL TUBERS TONNES/HECTARE

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	29	4.99	16.1

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

OXAMYL	4.5	9.0	MEAN
IRRIGTN			
NONE	85.7	85.4	85.6
FULL	93.1	92.6	92.9
MEAN	89.4	89.0	89.2

METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR	MEAN
IRRIGTN					
NONE	84.0	84.2	87.7	86.3	85.6
FULL	93.2	92.9	91.5	93.9	92.9
MEAN	88.6	88.6	89.6	90.1	89.2

METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR	MEAN
OXAMYL					
4.5	88.1	89.3	89.3	91.1	89.4
9.0	89.1	87.8	89.9	89.1	89.0
MEAN	88.6	88.6	89.6	90.1	89.2

IRRIGTN	METHOD	S/RV	W/RR	C+W/RR	S+C+W/RR
	OXAMYL				
NONE	4.5	83.9	84.5	87.0	87.5
	9.0	84.2	84.0	88.4	85.2
FULL	4.5	92.3	94.0	91.5	94.7
	9.0	94.0	91.7	91.4	93.1

IRRIGTN	NONE	FULL	MEAN
EXTRA			
NONE- RR	60.3	90.7	75.5
NONE+ RR	80.1	92.1	86.1
NONE+ RV	72.6	93.6	83.1
OX 2S RV	86.5	93.4	90.0
OX 7S RV	82.8	94.5	88.6
AL 2S RV	79.3	94.8	87.0
AL 4S RV	85.0	93.4	89.2
AL 9S RV	84.5	94.4	89.4
MEAN	78.9	93.4	86.1

GRAND MEAN 87.7

SUB PLOT AREA HARVESTED 0.00130