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86/W/CS/34 Nematicides in Crop Sequence - Potatoes, W. Wheat, S. Barley

Rothamsted Research

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86/W/CS/34

NEMATOCIDES IN CROP SEQUENCE

Object: To study the effects of a range of nematocides on the incidence of *Globodera rostochiensis* and yield of potatoes. Residual effects of previous treatments are studied in wheat and barley - Woburn Great Hill II and III.

Sponsor: A.G. Whitehead.

The 18th year, potatoes, w. wheat, s. barley.

For previous years see 71/W/CS/34(t), 72/W/CS/34(t) and 73-85/W/CS/34.

Design: 4 series of 3 blocks of 10 plots.

Whole plot dimensions: 4.27 x 9.14.

Treatments: The experiment has four series with the following cropping:-

	1970	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Series I	P	P*	SB	B	P	P*	W	B	P	P*	B	B	P	P*	W	B	P
Series II	P	P	P*	SB	B	P	P*	W	B	P	P*	W	B	P	P*	B	B
Series III	B	P	P	P*	SB	B	P	P*	W	B	P	P*	W	B	P	P*	W
Series IV	B	P	P	P	P*	SB	B	P	P*	W	B	P	P*	W	B	P	P*

P = potatoes, SB = sugar beet, B = s. barley, W = w. wheat

* Treatments applied to potatoes, subsequent crops test residual effects.

Treatments to potatoes (Series I): All combinations of:-

1. NEMACIDE(83) Residues of nematocides applied 1983:

FMC65201
FMC67825
OXAMYL

2. RATE Rates of nematocide (kg a.i.):

2.8
5.6
11.2

plus one untreated plot per block

RATE

0.0

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Treatments to s. barley (Series II): All combinations of:-

1. NEMACIDE(84) Residues of nematicides applied 1984:

ALDICARB
SDS38697
SDS46995

2. RATE Rates of nematicide (a.i.):

SINGLE Single (2.8 kg of aldicarb, 1.4 kg of SDS materials)
DOUBLE Double (5.6 kg of aldicarb, 2.8 kg of SDS materials)
QUAD Quadruple (11.2 kg of aldicarb, 5.6 kg of SDS materials)

plus one untreated plot per block

RATE

NONE

Treatments to w. wheat (Series III): All combinations of:-

1. NEMACIDE(85) Residues of nematicides applied 1985:

OXAMYL Oxamyl
SDS46995 'SDS 46995'
THIODICA Thiodicarb

2. RATE Rates of nematicide (a.i.):

SINGLE Single (1.4 kg of 'SDS 46995', 2.8 kg of other materials)
DOUBLE Double (2.8 kg of 'SDS 46995', 5.6 kg of other materials)
QUAD Quadruple (5.6 kg of 'SDS 46995', 11.2 kg of other materials)

plus one untreated plot per block

RATE

NONE

Treatments to potatoes (Series IV):

1. NEMACIDE(86) Nematicides and rates (a.i.) applied 1986:

AL 3.3	Aldicarb at 3.3 kg
AL 6.6	Aldicarb at 6.6 kg
AL S 3.3	Aldicarb, slow release formulation at 3.3 kg
AL S 6.6	Aldicarb, slow release formulation at 6.6 kg
ETH 7.5	Ethoprophos at 7.5 kg
MB 5.0	'MB 41380' at 5.0 kg
MB 7.5	'MB 41380' at 7.5 kg
MB 10.0	'MB 41380' at 10.0 kg
OX 5.0	Oxamyl at 5.0 kg
NONE	None

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Standard applications:

- Potatoes (series I and IV): Manures: (10:10:15+4.5 Mg) at 2330 kg.
Weedkillers: Glyphosate at 1.4 kg in 250 l to Series I only,
paraquat at 0.40 kg ion with linuron at 0.80 kg in 250 l.
Fungicides: Mancozeb at 1.4 kg on two occasions in 240 l and
applied with the insecticide on two occasions in 200 l. Fentin
hydroxide at 0.28 kg applied with the insecticide in 200 l.
Insecticide: Pirimicarb at 0.14 kg on three occasions. Desiccant:
Diquat at 0.42 kg ion in 250 l.
- W. wheat (Series III): Manures: Magnesian limestone at 7.5 t.
(5:14:30) at 340 kg. N at 210 kg as 'Nitram'. Weedkillers:
Clopyralid at 0.07 kg with bromoxynil octanoate at 0.34 kg and
mecoprop at 2.1 kg with the fungicides in 250 l. Fungicides:
Prochloraz at 0.40 kg with carbendazim at 0.15 kg.
- S. barley (Series II): Manures: (20:10:10) at 630 kg. Weedkillers:
Clopyralid at 0.07 kg with bromoxynil octanoate at 0.34 kg and
mecoprop at 2.1 kg with the fungicide in 250 l. Fungicide:
Tridemorph at 0.52 kg.

Seed: Potatoes: Pentland Crown.

W. wheat: Avalon, sown at 190 kg.

S. barley: Klaxon, sown at 160 kg.

Cultivations, etc.:-

- Potatoes (Series I and IV): Glyphosate applied (Series I only):
6 Nov. Deep-tine cultivated three times (Series IV only): 29 Nov,
13 Jan, 1986, 28 Jan. Ploughed (Series I only): 16 Dec, 1985.
NPK Mg applied (both series), spring-tine cultivated, treatments
applied, rotary cultivated, potatoes planted (Series IV): 28 Apr,
1986. Rotary cultivated, potatoes planted (Series I): 29 Apr.
Rotary ridged (Series IV): 30 Apr. Rotary ridged (Series I),
weedkillers applied (both series): 29 May. Mancozeb applied:
1 July, 14 July. Mancozeb with insecticide applied: 29 July,
13 Aug. Fentin Hydroxide with insecticide applied: 30 Aug. Haulm
mechanically destroyed: 29 Sept. Desiccant applied: 10 Oct.
Lifted: (Series I): 7-10 Nov, (Series IV): 11 Nov.
- W. wheat (Series III): Magnesian limestone, NPK applied: 25 Oct,
1985. Power harrowed, harrowed, seed sown: 26 Oct. N applied:
25 Apr, 1986. Weedkillers and fungicides applied: 3 May. Combine
harvested: 21 Aug.
- S. barley (Series II): Ploughed: 16 Dec, 1985. NPK applied, rotary
harrowed, seed sown: 11 Apr, 1986. Weedkillers and fungicide
applied: 19 May. Combine harvested: 18 Aug.

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POTATOES SERIES I

TOTAL TUBERS TONNES/HECTARE

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

RATE	2.8	5.6	11.2	MEAN
NEMACIDE(83)				
FMC65201	36.6	38.9	37.6	37.7
FMG67825	33.7	44.4	44.3	40.8
OXAMYL	39.8	33.7	40.5	38.0
MEAN	36.7	39.0	40.8	38.8

RATE 0.0 27.4

GRAND MEAN 37.7

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

TABLE	NEMACIDE(83)	RATE NEMACIDE(83)	RATE & RATE 0.0
SED	1.69	1.69	2.93

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	3.59	9.5

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

RATE	2.8	5.6	11.2	MEAN
NEMACIDE(83)				
FMC65201	95.9	97.4	97.1	96.8
FMG67825	95.9	97.9	97.6	97.2
OXAMYL	97.1	96.1	97.1	96.7
MEAN	96.3	97.1	97.3	96.9

RATE 0.0 94.5

GRAND MEAN 96.7

PLOT AREA HARVESTED 0.00130

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POTATOES SERIES IV

TOTAL TUBERS TONNES/HECTARE

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

NEMACIDE(86)

AL 3.3	46.0
AL 6.6	44.2
AL S 3.3	46.2
AL S 6.6	48.8
ETH 7.5	34.7
MB 5.0	34.8
MB 7.5	39.1
MB 10.0	36.8
OX 5.0	45.4
NONE	9.5
MEAN	38.5

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

TABLE NEMACIDE(86)

SED 4.04

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	4.95	12.8

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

NEMACIDE(86)

AL 3.3	98.2
AL 6.6	98.2
AL S 3.3	97.5
AL S 6.6	98.0
ETH 7.5	97.5
MB 5.0	96.5
MB 7.5	96.2
MB 10.0	97.5
OX 5.0	98.3
NONE	81.7
MEAN	96.0

PLOT AREA HARVESTED 0.00130

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W. WHEAT SERIES III

GRAIN TONNES/HECTARE

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

	RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(85)					
OXAMYL		4.56	5.83	5.01	5.13
SDS46995		4.41	4.53	4.35	4.43
THIODICA		4.58	4.71	4.64	4.64
MEAN		4.52	5.02	4.67	4.73

RATE NONE 4.41

GRAND MEAN 4.70

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

TABLE	NEMACIDE(85)	RATE NEMACIDE(85)	RATE & RATE NONE
SED	0.271	0.271	0.469

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.575	12.2

GRAIN MEAN DM% 82.5

PLOT AREA HARVESTED 0.00251

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S. BARLEY SERIES II

GRAIN TONNES/HECTARE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(84)				
ALDICARB	4.59	4.06	5.11	4.59
SDS38697	4.55	4.19	4.78	4.51
SDS46995	4.88	4.71	4.32	4.63
MEAN	4.67	4.32	4.74	4.58

RATE NONE 4.20

GRAND MEAN 4.54

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

TABLE	NEMACIDE(84)	RATE NEMACIDE(84)	RATE & RATE NONE
SED	0.222	0.222	0.385

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.472	10.4
GRAIN MEAN DM%	84.5		
PLOT AREA HARVESTED	0.00251		