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80/W/CS/34 Nematicides in Crop Sequence

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80/W/CS/34

NEMATICIDES IN CROP SEQUENCE

Object: To study the effects of a range of nematicides on 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 11th year, potatoes, s. barley.

For previous years see 71/W/CS/34(t), 72/W/CS/34(t) and 73-79/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:-

	1969	70	71	72	73	74	75	76	77	78	79	80
Series I	P	P	P*	SB	B	P	P*	W	B	P	P*	B+
Series II	P	P	P	P*	SB	B	P	P*	W	B	P	P*
Series III	P	B	P	P	P*	SB	B	P	P*	W	B	P
Series IV	P	B	P	P	P	P*	SB	B	P	P*	W	B

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

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

+ W. wheat failed and was replaced by s. barley.

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

1. NEMACIDE(79) Residues of nematicides applied 1979:

ALDICARB	Aldicarb
CARBENDA	Carbendazim
TERBUFOS	Terbufos

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

SINGLE	Single (2.5 kg for aldicarb and terbufos : 5.0 kg for carbendazim)
DOUBLE	Double (5.0 kg for aldicarb and terbufos : 10.0 kg for carbendazim)
QUAD	Quadruple (10.0 kg for aldicarb and terbufos : 20.0 kg for carbendazim)

plus one untreated plot

RATE

NONE

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Treatments to potatoes (Series II):

NEMACIDE(80)	Nematicides applied 1980 (kg a.i.):
NONE	None
BAS 1	'BAS 263 08J 80-1' at 2.8
BAS 2	'BAS 263 08J 80-1' at 5.6
BAS 4	'BAS 263 08J 80-1' at 11.2
CARBOF 2	Carbofuran at 5.6
ETHOP 4	Ethoprophos at 11.2
FMC 2	'FMC 35001' at 5.6
OX 2	Oxamyl at 5.6
OX S1 2	Oxamyl slow-release formulation 'DPX 4702' at 5.6
OX S2 2	Oxamyl slow-release formulation 'DPX 5577' at 5.6

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

1. NEMACIDE(77) Residues of nematicides applied 1977:

AC 64475	'AC 64475'
CARBOFUR	Carbofuran
PHOXIM	Phoxim

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

		'AC 64475'	Carbofuran	Phoxim
SINGLE	Single	2.2	2.8	5.6
DOUBLE	Double	4.4	5.6	11.2
QUAD	Quadruple	8.8	11.2	22.4

plus one untreated plot

RATE

NONE

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

1. NEMACIDE(78) Residues of nematicides applied 1978:

BENDIOCA	Bendiocarb
THIOPHAN	Thiophanate methyl
TERBUFOS	Terbufos

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

5
10
20

plus one untreated plot

RATE

0.0

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Standard applications:

Barley (Series I after failed w. wheat & IV): Manures: Magnesian limestone at 5 t to Series I only, (0:20:20) at 310 kg, combine drilled to wheat Series I only, (20:10:10) at 450 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 280 l). Fungicides: Tridemorph to Series I only at 0.53 kg in 280 l. Triadimefon to Series IV only at 0.13 kg in 280 l.
Potatoes (Series II and Series III): Manures: (13:13:20) at 1880 kg. Weedkiller: Linuron at 1.1 l in 280 l. Fungicide: Mancozeb at 1.3 kg in 300 l applied five times, with insecticide on the first, third, fourth and fifth occasions. Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Wheat: Flanders, sown at 190 kg.
Barley: Georgie, dressed with ethirimol, sown at 160 kg.
Potatoes: Pentland Crown.

Cultivations, etc.:-

Wheat (Series I): Magnesian limestone applied, heavy spring-tine cultivated, spring-tine cultivated, seed sown: 31 Oct, 1979. Ploughed: 14 Feb, 1980.
Barley (Series I & IV): Ploughed (Series IV): 23 Nov, 1979. Spring-tine cultivated with crumbler attached: 28 Feb, 1980. Seed sown: 29 Feb. Weedkillers applied: 7 May. Tridemorph applied: 13 May and 5 June to Series I. Triadimefon applied: 5 June to Series IV. Combine harvested: 19 Aug.
Potatoes (Series II & III): Heavy spring-tine cultivated, spring-tine cultivated: 30 Oct, 1979 (Series II). Ploughed: 23 Nov (Series III), 14 Feb, 1980 (Series II). NPK applied: 12 Apr. Rotary cultivated, potatoes planted: 18 Apr (Series III). Spring-tine cultivated: 23 Apr (Series II). Treatments applied, rotary cultivated, potatoes planted: 28 Apr (Series II). Weedkiller applied: 17 May. Grubbed: 11 June. Earthed up: 12 June. Fungicide applied: 18 June, 3 July, 22 July, 8 Aug, 22 Aug. Insecticide applied: 18 June, 22 July, 8 Aug, 22 Aug. Haulm mechanically destroyed: 22 Sept. Haulm desiccant applied: 24 Sept. Lifted: 1 - 2 Oct.

NOTE: Soil samples were taken before applying treatments and after harvest for counts of cysts, eggs and larvae of *Globodera rostochiensis*.

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POTATOES SERIES II

TOTAL TUBERS TONNES/HECTARE

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

NEMACIDE (80)	
NONE	29.2
BAS 1	51.4
BAS 2	49.7
BAS 4	51.3
CARBOF 2	55.4
ETHOP 4	54.2
FMC 2	46.8
OX 2	59.9
OX S1 2	58.4
OX S2 2	61.3
MEAN	51.8

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

TABLE	NEMACIDE (80)
-----	-----
SED	2.37

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	2.90	5.6

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

NEMACIDE (80)	
NONE	94.2
BAS 1	97.6
BAS 2	96.8
BAS 4	97.9
CARBOF 2	97.6
ETHOP 4	97.8
FMC 2	97.1
OX 2	97.6
OX S1 2	97.5
OX S2 2	98.0
MEAN	97.2

PLOT AREA HARVESTED 0.00130

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POTATOES SERIES III

TOTAL TUBERS TONNES/HECTARE

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

RATE NEMACIDE(77)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	54.4	55.8	59.7	56.6
CARBOFUR	52.7	55.2	57.6	55.2
PHOXIM	48.1	50.8	52.9	50.6
MEAN	51.7	53.9	56.8	54.1
RATE NONE	48.3			
GRAND MEAN	53.6			

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

TABLE	NEMACIDE(77)	RATE NEMACIDE(77)	RATE & RATE NONE
SED	1.50	1.50	2.60

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	3.18	5.9

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

RATE NEMACIDE(77)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	98.6	98.1	98.4	98.4
CARBOFUR	98.6	98.6	98.7	98.6
PHOXIM	98.5	98.3	98.4	98.4
MEAN	98.6	98.3	98.5	98.5
RATE NONE	98.4			
GRAND MEAN	98.5			

PLOT AREA HARVESTED 0.00130

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BARLEY SERIES I

GRAIN TONNES/HECTARE

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

RATE NEMACIDE(79)	SINGLE	DOUBLE	QUAD	MEAN
ALDICARB	3.90	4.14	3.57	3.87
CARBENDA	3.63	3.52	3.91	3.69
TERBUFOS	3.83	4.36	4.19	4.13
MEAN	3.78	4.01	3.89	3.90
RATE NONE		3.93		
GRAND MEAN		3.90		

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

TABLE	NEMACIDE(79)	RATE NEMACIDE(79) RATE & RATE NONE
-----	-----	-----
SED	0.205	0.205 0.354

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.434	11.1
GRAIN MEAN DM%	81.0		
PLOT AREA HARVESTED	0.00260		

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BARLEY SERIES IV

GRAIN TONNES/HECTARE

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

	RATE	5	10	20	MEAN
NEMACIDE (78)					
BENDIOCA		4.36	4.39	4.84	4.53
THIOPHAN		4.85	4.74	4.74	4.78
TERBUFOS		4.47	4.55	4.74	4.59
MEAN		4.56	4.56	4.77	4.63
RATE 0.0	4.59				
GRAND MEAN					4.63

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

TABLE	NEMACIDE (78)	RATE NEMACIDE (78)	RATE NEMACIDE (78)
			& RATE 0.0
SED	0.173	0.173	0.300

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.368	8.0
GRAIN MEAN DM%	81.3		
PLOT AREA HARVESTED	0.00260		