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# Yields of the Field Experiments 1979

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## 79/W/CS/34 Nematicides in Crop Sequence - Potatoes, Wheat, Barley

### Rothamsted Research

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79/W/CS/34

NEMATOCIDES 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 tenth year, potatoes, wheat, barley.

For previous years see 71/W/CS/34(t), 72/W/CS/34(t) and 73-78/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
Series I	P	P	P*	SB	B	P	P*	W	B	P	P*
Series II	P	P	P	P*	SB	B	P	P*	W	B	P
Series III	P	B	P	P	P*	SB	B	P	P*	W	B
Series IV	P	B	P	P	P	P*	SB	B	P	P*	W

P = potatoes, SB = sugar beet, B = barley, W = wheat

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

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

1. NEMACIDE(79) 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

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

1. NEMACIDE(76) Residues of nematicides applied 1976:

AC 64475	'AC 64475'
CARBOFUR	Carbofuran
PHOXIM	Phoxim

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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 barley (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 wheat (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

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Standard applications:

Potatoes (Series I & II): Manures: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.0 kg plus paraquat at 0.28 kg ion in 250 l. Fungicide: Mancozeb at 1.3 kg in 250 l on six occasions, with insecticide on the first two. Insecticide: Pirimicarb at 0.14 kg on two occasions, with fungicide. Haulm desiccant: Undiluted BOV at 170 l (Series II only).  
Wheat (Series IV): Manures: Magnesian limestone at 5 t. (10:24:24) at 260 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 250 l).  
Barley (Series III): Manures: (20:14:14) at 450 kg, combine drilled. Weedkillers: Bromoxynil with ioxynil ('Oxytril CM' at 2.1 kg in 250 l).

Seed: Potatoes: Pentland Crown.

Wheat: Flanders, sown at 180 kg.

Barley: Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:-

Potatoes (Series I & II): Heavy spring-tine cultivated: 13 Sept, 1978 (Series II). Heavy spring-tine cultivated: 19 Oct. Ploughed: 3 Apr, 1979. NPK applied: 4 May. Spring-tine cultivated: 8 May. Rotary cultivated, potatoes planted: 9 May (Series II). Treatments applied, spring-tine cultivated: 11 May (Series I). Rotary cultivated, potatoes planted: 14 May (Series I). Weedkillers applied: 25 May. Rotary ridged: 19 June. Fungicide applied: 27 June, 10 July, 23 July, 11 Aug, 25 Aug, 5 Sept. Insecticide applied: 27 June, 10 July. Haulm desiccant applied: 24 Sept (Series II). Haulm mechanically destroyed: 8 Oct. Lifted: 24 Oct.  
Wheat (Series IV): Magnesian limestone applied, deep-tine cultivated, spring-tine cultivated with crumbler attached, seed sown: 13 Oct, 1978. N applied: 19 Apr, 1979. Weedkillers applied: 14 May. Combine harvested: 31 Aug.  
Barley (Series III): Heavy spring-tine cultivated: 13 Sept, 1978. Ploughed: 3 Apr, 1979. Spring-tine cultivated with crumbler attached: 21 Apr. Seed sown: 23 Apr. Weedkillers applied: 4 June. Combine harvested: 28 Aug.

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 I

TOTAL TUBERS TONNES/HECTARE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(79)				
ALDICARB	39.3	48.3	42.0	43.2
CARBENDA	18.6	20.6	27.1	22.1
TERBUFOS	23.6	32.1	32.0	29.2
MEAN	27.1	33.7	33.7	31.5
RATE NONE	14.8			
GRAND MEAN	29.8			

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

TABLE	NEMACIDE(79)	RATE NEMACIDE(79)	RATE & RATE NONE
-----			
SED	1.48	1.48	2.57

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	3.15	10.6

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(79)				
ALDICARB	93.1	95.1	93.2	93.8
CARBENDA	92.9	91.9	93.6	92.8
TERBUFOS	92.0	91.3	93.2	92.2
MEAN	92.7	92.8	93.3	92.9
RATE NONE	91.2			
GRAND MEAN	92.8			

PLOT AREA HARVESTED 0.00130

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POTATOES SERIES II

TOTAL TUBERS TONNES/HECTARE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(76)				
AC 64475	29.3	32.7	31.5	31.2
CARBOFUR	29.9	27.2	28.7	28.6
PHOXIM	25.6	24.8	25.9	25.4
MEAN	28.3	28.2	28.7	28.4
RATE NONE		29.0		
GRAND MEAN		28.5		

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

TABLE	NEMACIDE(76)	RATE NEMACIDE(76)	RATE & RATE NONE
SED	0.82	0.82	1.42

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	1.74	6.1

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

NEMACIDE(76)				
AC 64475	94.3	95.1	93.9	94.4
CARBOFUR	94.2	93.6	93.6	93.8
PHOXIM	93.0	92.1	92.3	92.5
MEAN	93.8	93.6	93.3	93.6
RATE NONE		94.3		
GRAND MEAN		93.7		

PLOT AREA HARVESTED 0.00130

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WHEAT SERIES IV

GRAIN TONNES/HECTARE

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

RATE NEMACIDE(78)	5	10	20	MEAN
BENDIOCA	2.74	2.82	3.52	3.03
THIOPHAN	2.95	2.49	3.22	2.89
TERBUFOS	3.24	3.74	3.94	3.64
MEAN	2.98	3.02	3.56	3.18
RATE 0	3.22			
GRAND MEAN	3.19			

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

TABLE	NEMACIDE(78)	RATE NEMACIDE(78) RATE & RATE 0
SED	0.154	0.154 0.267

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.328	10.3
GRAIN MEAN DM%	86.5		

STRAW TONNES/HECTARE

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

RATE NEMACIDE(78)	5	10	20	MEAN
BENDIOCA	2.91	3.27	3.77	3.32
THIOPHAN	3.14	2.72	3.53	3.13
TERBUFOS	3.00	3.51	3.40	3.30
MEAN	3.02	3.17	3.56	3.25
RATE 0	3.53			
GRAND MEAN	3.28			

STRAW MEAN DM% 86.4

PLOT AREA HARVESTED 0.00260

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BARLEY SERIES III

GRAIN TONNES/HECTARE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(77)				
AC 64475	3.28	3.06	3.18	3.17
CARBOFUR	2.88	3.19	3.21	3.09
PHOXIM	3.19	2.79	3.08	3.02
MEAN	3.12	3.01	3.16	3.10
RATE NONE	3.13			
GRAND MEAN	3.10			

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

TABLE	NEMACIDE(77)	RATE NEMACIDE(77)	RATE & RATE NONE
SED	0.109	0.109	0.188

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.230	7.4
GRAIN MEAN DM%	84.5.		

STRAW TONNES/HECTARE

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

RATE	SINGLE	DOUBLE	QUAD	MEAN
NEMACIDE(77)				
AC 64475	1.81	1.77	1.85	1.81
CARBOFUR	1.63	1.90	1.76	1.76
PHOXIM	1.68	1.75	1.79	1.74
MEAN	1.71	1.81	1.80	1.77
RATE NONE	1.81			
GRAND MEAN	1.78			

STRAW MEAN DM% 92.0

PLOT AREA HARVESTED 0.00260