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79/W/CS/35 Nematicides Dosage - Potatoes, Wheat

Rothamsted Research

Rothamsted Research (1980) *79/W/CS/35 Nematicides Dosage - Potatoes, Wheat* ; Yields Of The Field Experiments 1979, pp 109 - 115 - DOI: <https://doi.org/10.23637/ERADOC-1-45>

79/W/CS/35

NEMATOCIDES DOSAGE

Object: To study the effects of rates and methods of applying nematocides on *Globodera rostochiensis* and yield of potatoes; residual effects are also studied - Woburn Stackyard AII.

Sponsor: A.G. Whitehead.

The eighth year, potatoes, wheat.

For previous years see 72/W/CS/35(t) and 73-78/W/CS/35.

Design: 3 series each 4 randomised blocks of 18 plots.

Whole plot dimensions: 4.27 x 6.10.

Treatments:-

The experiment has three series with the following cropping:-

	1968-71	72	73	74	75	76	77	78	79
Series I	P	P*	SB	B	P*	P	P	P*	W
Series II	P	P	P*	SB	B	P*	P	P	P*
Series III	P	P	P	P*	SB	B	P*	P	P

P = Potatoes, SB = Sugar beet, B = Barley, W = wheat

*Treatments applied to potatoes, following two crops test residual effects.

Treatments:

On Series I, wheat 1979, new sets of treatments were applied for potatoes in 1978 which ignored those applied in earlier years. All combinations of:-

1. A NEM(78) Residual effects of nematocide applied autumn 1977:

NONE None
TELONE 'Telone' at 224 kg

2. S NEM(78) Residual effects of nematocide applied spring 1978:

ALDICARB
OXAMYL

3. SNEMRATE Rates of spring nematocides (kg):

2.5
5.0
7.5
10.0

plus two untreated plots per block

RATE
NONE

79/W/CS/35

On Series II the same sets of treatments were applied for potatoes in 1979, ignoring those applied in earlier years. All combinations of:-

1. A NEM(79) Autumn nematicide:
NONE None
TELONE 'Telone' at 224 kg
2. S NEM(79) Spring nematicide:
ALDICARB
OXAMYL
3. SNEMRATE Rates of spring nematicides (kg):
2.5
5.0
7.5
10.0

plus two untreated plots per block

RATE

NONE

On Series III residual effects of treatments in the previous scheme are tested on potatoes 1979. All combinations of:-

1. VARIETY Residual effects of varieties:

	1974	1977-79
(PC)PC3	Pentland Crown	Pentland Crown
(MP)PC3	Maris Piper	Pentland Crown
2. NEM RES(77) Residual effects of nematicides (kg) applied for potatoes 1974 & 1977:
NONE None
DAZ 2 Dazomet at 220
DAZ 3 Dazomet at 330
DAZ 4 Dazomet at 440
DAZ 6 Dazomet at 660
DAZ2+TE2 Dazomet at 220 plus 'Telone' at 220
TE4 'Telone' at 450
OX Oxamyl at 5.6
TE2+OX 'Telone' at 220 plus oxamyl at 5.6

Standard applications:

Wheat (Series I): 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).

Potatoes (Series II & III): Manures: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.0 kg plus paraquat at 0.28 kg ion in 250 l (Series III only). 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 III only).

Seed: Wheat: Flanders, sown at 180 kg.
Potatoes: Pentland Crown.

79/W/CS/35

Cultivations, etc.:-

Wheat (Series I): Magnesian limestone applied: 9 Oct, 1978. Heavy spring-tine cultivated twice: 10 Oct. Rotary cultivated: 10 Oct. Seed sown: 11 Oct. N applied: 21 Apr, 1979. Weedkillers applied: 15 May. Combine harvested: 30 Aug.

Potatoes (Series II): Heavy spring-tine cultivated twice: 10 Oct, 1978, 16 Oct. Spring-tine cultivated, 'Telone' injected, spring-tine cultivated: 21 Nov. NPK applied: 5 May, 1979. Spring-tine cultivated: 8 May. Aldicarb and oxamyl applied: 9 May. Rotary cultivated, potatoes planted: 10 May. Grubbed: 7 June. Rotary ridged: 19 June. Fungicide applied: 26 June, 10 July, 23 July, 8 Aug, 25 Aug, 6 Sept. Insecticide applied: 26 June, 10 July. Haulm mechanically destroyed: 8 Oct. Lifted: 24 Oct.

Potatoes (Series III): Heavy spring-tine cultivated: 16 Oct, 1978. NPK applied: 5 May, 1979. Spring-tine cultivated: 8 May. Rotary cultivated, potatoes planted: 9 May. Weedkillers applied: 25 May. Rotary ridged: 19 June. Fungicide applied: 26 June, 10 July, 23 July, 8 Aug, 25 Aug, 6 Sept. Haulm desiccant applied and haulm mechanically destroyed: 25 Sept. Lifted: 9 Oct.

- NOTES: (1) Soil samples were taken before treatments were applied and after harvest for cyst and egg counts of *Globodera rostochiensis*.
(2) Because of soil erosion damage the yields of four plots of potatoes, Series II, were lost, those with treatment combinations:
- | | | | |
|-----------|--------|----------|--------|
| A NEM(79) | TELONE | NONE | TELONE |
| S NEM(79) | OXAMYL | ALDICARB | OXAMYL |
| SNEMRATE | 2.5 | 2.5 | 7.5 |
- and one RATE NONE plot.

Estimated values were used in the analysis.

- (3) Because of storm damage the yields of six plots of wheat, Series I, were lost, those with treatment combinations:
- | | | | | | | |
|-----------|--------|----------|--------|----------|----------|----------|
| A NEM(78) | NONE | NONE | NONE | TELONE | NONE | TELONE |
| S NEM(78) | OXAMYL | ALDICARB | OXAMYL | ALDICARB | ALDICARB | ALDICARB |
| SNEMRATE | 2.5 | 2.5 | 7.5 | 7.5 | 7.5 | 10.0 |
- Estimated values were used in the analysis.

79/W/CS/35

POTATOES SERIES II

TOTAL TUBERS TONNES/HECTARE

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

S NEM(79)	ALDICARB	OXAMYL	MEAN		
A NEM(79)					
NONE	49.7	52.9	51.3		
TELONE	55.5	52.7	54.1		
MEAN	52.6	52.8	52.7		
SNEMRATE	2.5	5.0	7.5	10.0	MEAN
A NEM(79)					
NONE	46.4	55.3	52.4	51.3	51.3
TELONE	56.5	53.5	52.4	54.0	54.1
MEAN	51.5	54.4	52.4	52.7	52.7
SNEMRATE	2.5	5.0	7.5	10.0	MEAN
S NEM(79)					
ALDICARB	50.2	54.4	52.0	54.0	52.6
OXAMYL	52.7	54.3	52.9	51.4	52.8
MEAN	51.5	54.4	52.4	52.7	52.7
A NEM(79)	SNEMRATE	2.5	5.0	7.5	10.0
NONE	ALDICARB	44.3	54.5	48.6	51.6
	OXAMYL	48.6	56.0	56.1	51.0
TELONE	ALDICARB	56.1	54.3	55.3	56.4
	OXAMYL	56.9	52.6	49.6	51.7

RATE NONE 24.3

GRAND MEAN 49.6

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

TABLE	A NEM(79)	S NEM(79)	SNEMRATE	
SED	1.68	1.68	2.37	
TABLE	A NEM(79) S NEM(79)	A NEM(79) SNEMRATE	S NEM(79) SNEMRATE	A NEM(79) S NEM(79) SNEMRATE & RATE NONE
SED	2.37	3.35	3.35	4.74 4.11*

* USE ONLY FOR COMPARISONS OF RATE NONE V ANY OF THE REMAINDER

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

STRATUM	DF	SE	CV%
BLOCK.WP	48	6.71	13.5

79/W/CS/35

POTATOES SERIES II

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

S NEM(79)	ALDICARB	OXAMYL	MEAN		
A NEM(79)					
	NONE	94.5	93.7	94.1	
	TELONE	94.8	93.2	94.0	
	MEAN	94.6	93.5	94.1	
S NEMRATE	2.5	5.0	7.5	10.0	MEAN
A NEM(79)					
	NONE	94.6	93.9	94.1	93.7
	TELONE	94.5	93.6	94.1	93.9
	MEAN	94.6	93.8	94.1	93.8
S NEMRATE	2.5	5.0	7.5	10.0	MEAN
S NEM(79)					
	ALDICARB	94.9	94.5	94.3	94.9
	OXAMYL	94.2	93.0	93.9	92.7
	MEAN	94.6	93.8	94.1	93.8
	S NEMRATE	2.5	5.0	7.5	10.0
A NEM(79)	S NEM(79)				
	NONE	ALDICARB	95.0	94.4	94.2
		OXAMYL	94.3	93.5	94.0
	TELONE	ALDICARB	94.8	94.6	94.4
		OXAMYL	94.2	92.6	93.9

RATE NONE 89.2

GRAND MEAN 93.5

PLOT AREA HARVESTED 0.00087

79/W/CS/35 POTATOES SERIES III

TOTAL TUBERS TONNES/HECTARE

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

VARIETY NEM RES(77)	(PC)PC3	(MP)PC3	MEAN
NONE	16.7	13.1	14.9
DAZ 2	9.0	11.9	10.4
DAZ 3	13.3	10.5	11.9
DAZ 4	10.7	19.6	15.1
DAZ 6	12.7	21.2	17.0
DAZ2+TE2	11.5	14.2	12.8
TE4	14.8	10.6	12.7
OX	10.5	13.7	12.1
TE2+OX	10.7	24.8	17.7
MEAN	12.2	15.5	13.9

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

TABLE	NEM RES(77)	VARIETY NEM RES(77) VARIETY
-----	-----	-----
SED	2.40	1.07 3.38

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

STRATUM	DF	SE	CV%
BLOCK.WP	47	4.55	32.8

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

VARIETY NEM RES(77)	(PC)PC3	(MP)PC3	MEAN
NONE	85.9	84.4	85.2
DAZ 2	78.6	77.8	78.2
DAZ 3	85.6	79.4	82.5
DAZ 4	83.7	90.5	87.1
DAZ 6	85.2	87.1	86.1
DAZ2+TE2	81.1	87.5	84.3
TE4	83.5	73.6	78.6
OX	78.6	78.5	78.5
TE2+OX	76.3	89.6	83.0
MEAN	82.0	83.2	82.6

PLOT AREA HARVESTED 0.00087

79/W/CS/35

WHEAT SERIES I

GRAIN TONNES/HECTARE

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

S NEM(78)	ALDICARB	OXAMYL	MEAN		
A NEM(78)					
NONE	5.15	5.31	5.23		
TELONE	5.80	5.56	5.68		
MEAN	5.47	5.43	5.45		
S NEM(78)	2.5	5.0	7.5	10.0	MEAN
A NEM(78)					
NONE	5.35	5.55	5.14	4.90	5.23
TELONE	5.61	5.78	5.48	5.83	5.68
MEAN	5.48	5.67	5.31	5.37	5.45
S NEM(78)	2.5	5.0	7.5	10.0	MEAN
A NEM(78)					
ALDICARB	5.37	5.73	5.24	5.55	5.47
OXAMYL	5.58	5.60	5.37	5.18	5.43
MEAN	5.48	5.67	5.31	5.37	5.45
A NEM(78)	S NEM(78)	2.5	5.0	7.5	10.0
NONE	ALDICARB	5.07	5.61	4.96	4.98
	OXAMYL	5.62	5.49	5.31	4.81
TELONE	ALDICARB	5.68	5.86	5.53	6.12
	OXAMYL	5.54	5.70	5.43	5.55

RATE NONE 5.18

GRAND MEAN 5.42

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

TABLE	A NEM(78)	S NEM(78)	SNEMRATE	
SED	0.115	0.115	0.163	
TABLE	A NEM(78)	A NEM(78)	S NEM(78)	A NEM(78)
	S NEM(78)	SNEMRATE	SNEMRATE	S NEM(78)
				SNEMRATE
				& RATE NONE
SED	0.163	0.230	0.230	0.326
				0.282*

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

STRATUM	DF	SE	CV%
WP	46	0.460	8.5

GRAIN MEAN DM% 85.7

PLOT AREA HARVESTED 0.00173