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75/ W/CS/35 - Nematicides Dosage - Potatoes, Sugar Beet, Barley

Rothamsted Research

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NEMATOCIDES DOSAGE

Object: To study the effects of rates and methods of applying nematicides on *Heterodera rostochiensis* and yield of potatoes, residual effects are studied in sugar beet and barley - Woburn Stackyard AII.

Sponsor: A.G. Whitehead.

The fourth year, potatoes, sugar beet, barley.

For previous years see 72/W/CS/35(t) and 73-74/W/CS/35.

Design: 3 series of 4 replicates of 2 x 9.

Whole plot dimensions: 4.27 x 6.10.

Treatments:-

The experiment has three series with the following cropping:-

	1968-71	1972	1973	1974	1975
Series I	P	P*	SB	B	P*
Series II	P	P	P*	SB	B
Series III	P	P	P	P*	SB

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

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

Treatments to Series I (1972 and 1975), Series II (1973) and Series III (1974):

All combinations of:-

1. Varieties

	VARIETY	
	Series I	Series II&III
Pentland Crown 1975 (Maris Piper 1972)	PC(MP)	PIPER
Pentland Crown 1975 and 1972	PC(PC)	CROWN

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2. Nematicides (kg)	NEMACIDE
None	NONE
Dazomet (half before, half after autumn ploughing)	
220	DAZ2
330	DAZ3
440	DAZ4
660	DAZ6
Dazomet, 220, 'Telone', 220, all after autumn ploughing	DAZ2/TE2
'Telone' 450 all after autumn ploughing	TE4
'DuPont 1410', 5.6 a.i. in spring	DUP
'Telone' 220, after autumn ploughing, 'DuPont 1410' 5.6 a.i. in spring	TE2/DUP

Sugar beet and barley test residual effects of potato varieties - RESVAR(74), RESVAR(73) - and nematicide - RESNEM(74), RESNEM(73).

Standard applications:-

Potatoes: Manures: (13:13:20) at 1480 kg. Insecticide: Demeton-s-methyl at 0.25 kg in 280 l. Fungicide: Mancozeb at 1.3 kg in 390 l.
 Sugar beet: Manures: Magnesian limestone at 5 tonnes. N at 160 kg as 'Nitro-Chalk'. (0:14:28) at 750 kg. Boron at 7.4 kg B203 (as 'Solubor') applied with insecticide. Insecticide: Demeton-s-methyl at 0.25 kg in 280 l and in 390 l when applied with 'Solubor'.
 Barley: Manures: (20:14:14) at 450 kg. Weedkiller: Ioxynil at 0.52 kg plus mecoprop at 1.6 kg in 280 l.

Seed: Potatoes: Pentland Crown.

Sugar beet: Klein E, sown at 5.6 kg.

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

Cultivations, etc.:-

Potatoes: Subsoiled, tines 140 cm apart and 56 cm deep: 3 Sept, 1974.
 Ploughed: 5 Dec. Dazomet and 'Telone' applied, all plots rotary cultivated: 9 Dec. Spring-tine harrowed: 10 Dec. NPK applied: 22 Apr, 1975. Deep-tine cultivated: 25 Apr. Spring-tine cultivated with crumbler: 28 Apr. 'DuPont 1410' applied, spring-tine cultivated: 1 May. Rotary cultivated, potatoes planted: 2 May. Inter-row rotary cultivated and ridged up: 12 May. Insecticide applied: 25 June. Fungicide applied: 15 July. Hand weeded: 24 July. Sprayed with undiluted B.O.V. at 160 l: 2 Oct. Haulm mechanically destroyed: 3 Oct. Lifted: 14 Oct.

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Barley: Deep-tine cultivated twice: 6 Jan, 1975. Spring-tine cultivated twice: 26 Feb, 25 Apr. Seed sown, rolled: 25 Apr. Weedkiller applied: 4 June. Combine harvested: 18 Aug.

Sugar beet: Magnesian limestone applied: 7 Nov, 1974. Deep-tine cultivated twice: 31 Dec, 6 Jan, 1975. N applied: 25 Apr. PK applied: 26 Apr. Spring-tine cultivated with crumbler: 28 Apr. Seed sown: 29 Apr. Tractor hoed twice: 29 May, 27 June. Singled: 5-16 June. Insecticide applied: 9 June. Insecticide applied with 'Solubor': 1 July. Side hoed: 8-9 July. Lifted: 6 Nov.

- NOTES: (1) Potatoes, Series I. Six plots were damaged by soil erosion, four plots were incorrectly treated and yield figures from one further plot were lost. Estimated values were used in the analysis. Treatments affected were VARIETY, PC(MP), NEMACIDE, NONE, DAZ2, DAZ3, DAZ2/TE2, TE4 (two plots), TE2/DUP and VARIETY, PC(PC), NEMACIDE, DAZ2, DAZ6, DAZ2/TE2, DUP.
- (2) Barley, Series II. Twelve plots were affected by waterlogging at sowing time and estimated values were used in the analysis. All were RESVAR(73), PC(MP) and RESNEM(73), NONE, DAZ2, DAZ3, DAZ4, DAZ6 (two plots), DAZ2/TE2, DUP (three plots), TE2/DUP (two plots).
- (3) Soil samples were taken before treatments were applied and after harvest for cyst and egg counts of *Heterodera rostochiensis*.

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POTATOES

TOTAL TUBERS TONNES/HECTARE

*** TABLES OF MEANS ***

VARIETY NEMACIDE	PC(MP)	FC(FC)	MEAN
NONE	12.5	7.3	9.9
DAZ2	21.1	14.2	17.7
DAZ3	22.2	22.1	22.2
DAZ4	25.2	24.1	24.6
DAZ6	22.2	24.9	23.5
DAZ2/TE2	18.6	20.4	19.5
TE4	20.4	12.8	16.6
DUP	21.6	21.2	21.4
TE2/DUP	22.6	23.0	22.8
MEAN	20.7	18.9	19.8

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

TABLE	NEMACIDE	NEMACIDE* VARIETY
SED	2.11	2.98

*WITHIN SAME LEVEL OF VARIETY ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP	36	4.11	20.7

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

*** TABLES OF MEANS ***

VARIETY NEMACIDE	PC(MP)	FC(FC)	MEAN
NONE	81.7	67.3	74.5
DAZ2	86.7	79.3	83.0
DAZ3	87.1	87.2	87.2
DAZ4	87.4	90.0	88.7
DAZ6	86.6	85.4	86.0
DAZ2/TE2	87.5	83.6	85.6
TE4	82.9	84.2	83.5
DUP	88.0	87.9	87.9
TE2/DUP	89.3	88.1	88.7
MEAN	86.4	83.7	85.0

PLOT AREA HARVESTED 0.00037

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BARLEY

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

RESVAR(73) RESNEM(73)	PIPER	CROWN	MEAN
NONE	2.92	2.98	2.95
DAZ2	2.99	3.28	3.13
DAZ3	3.13	3.51	3.32
DAZ4	2.90	3.00	2.95
DAZ6	3.17	3.23	3.20
DAZ2/TE2	3.10	3.15	3.12
TE4	3.15	2.94	3.05
DUP	3.10	2.96	3.03
TE2/DUP	2.79	3.33	3.06
MEAN	3.03	3.15	3.09

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

TABLE	RESNEM(73)	RESNEM(73)* RESVAR(73)
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SED	0.253	0.356

*WITHIN SAME LEVEL OF RESVAR(73) ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP	43	0.473	15.3

GRAIN MEAN DM% 87.6

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

RESVAR(73) RESNEM(73)	PIPER	CROWN	MEAN
NONE	2.57	2.54	2.55
DAZ2	2.51	2.78	2.64
DAZ3	2.47	2.89	2.68
DAZ4	2.64	2.51	2.57
DAZ6	2.53	2.66	2.59
DAZ2/TE2	2.48	2.54	2.51
TE4	2.71	2.71	2.71
DUP	2.30	2.45	2.38
TE2/DUP	2.63	2.76	2.70
MEAN	2.54	2.65	2.59

STRAW MEAN DM% 80.5

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PLOT AREA HARVESTED 0.00173

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SUGAR BEET

ROOTS (WASHED) TONNES/HECTARE

*** TABLES OF MEANS ***

RES VAR(74) RES NEM(74)	PIPER	CROWN	MEAN
NONE	10.3	10.2	10.2
DAZ2	11.4	11.8	11.6
DAZ3	11.9	11.1	11.5
DAZ4	12.1	12.4	12.2
DAZ6	11.0	10.5	10.7
DAZ2/TE2	11.8	11.5	11.6
TE4	10.3	9.8	10.0
DUP	10.1	10.5	10.3
TE2/DUP	11.3	12.3	11.8
MEAN	11.1	11.1	11.1

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

TABLE	RES NEM(74)	RESNEM(74)* RESVAR(74)
SED	0.79	1.11

*WITHIN SAME LEVEL OF RESVAR(74) ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP	47	1.49	13.4

SUGAR PERCENTAGE

*** TABLES OF MEANS ***

RES VAR(74) RES NEM(74)	PIPER	CROWN	MEAN
NONE	14.7	14.7	14.7
DAZ2	14.6	14.7	14.6
DAZ3	14.6	14.5	14.5
DAZ4	14.7	14.9	14.8
DAZ6	14.8	14.8	14.8
DAZ2/TE2	14.6	14.6	14.6
TE4	14.7	14.8	14.7
DUP	14.8	14.7	14.7
TE2/DUP	14.6	14.8	14.7
MEAN	14.6	14.7	14.7

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SUGAR BEET

TOTAL SUGAR TONNES/HECTARE

*** TABLES OF MEANS ***

RESVAR(74) RESNEM(74)	PIPER	CROWN	MEAN
NONE	1.51	1.50	1.50
DAZ2	1.67	1.73	1.70
DAZ3	1.74	1.62	1.68
DAZ4	1.78	1.84	1.81
DAZ6	1.62	1.55	1.59
DAZ2/TE2	1.72	1.68	1.70
TE4	1.51	1.44	1.48
DUP	1.49	1.54	1.52
TE2/DUP	1.65	1.81	1.73
MEAN	1.63	1.63	1.63

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

TABLE	RESNEM(74)	RESNEM(74)* RESVAR(74)
SED	0.120	0.169

*WITHIN SAME LEVEL OF RESVAR(74) ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP	47	0.227	13.9

PLOT AREA HARVESTED 0.00130