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72/W/CS/34 Nematicides in Crop Sequence - Sugar Beet

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72/W/CS/34

NEMATICIDES IN CROP SEQUENCE

Object: To study the effects of three nematicides on incidence of *Heterodera rostochiensis* and yield of potatoes grown continuously for four years, residual effects of similar treatments in 1971 are studied in sugar beet - Woburn Great Hill II and III.

Sponsor: A.G.Whitehead.

The fourth year, potatoes, sugar beet.

For previous years see 71/W/CS/34(t).

Design: 4 series of 3 blocks of 10 plots.

NOTE: Series II received fresh treatments to potatoes, Series I tested residual effects on sugar beet, Series III and IV continued in untreated susceptible potatoes.

Whole plot dimensions: 4.27 x 9.14. **Area harvested:** 0.00130.

Treatments: None (0), together with all combinations of:-

- (1) Nematicides. Series I: Applied to potatoes 1971: Aldicarb (A), Du Pont 1410 (D), Nematicur P (N),
Series II: Applied to potatoes 1972: Aldicarb (A), CGA 10576 (C), Du Pont 1410 (D).
- (2) Rates: 2.8, 5.6, 11.0 kg a.i.

Basal applications:

- Sugar beet:** 5 tonnes magnesian limestone, 750 kg (0:14:28), 160 kg N as 'Nitro-Chalk', 180 kg MgO as Epsom salts, 6.7 kg B₂O₃, as 'Solubor', in 400 l. **Weedkiller:** Phenmedipham at 1.1 kg in 280 l. **Insecticide:** Demeton-s-methyl at 0.5 kg in 280 l.
- Potatoes:** 1510 kg (13:13:20). **Weedkiller:** Linuron at 1.1 kg with paraquat at 0.4 kg ion in 370 l. **Fungicide:** Mancozeb at 1.3 kg in 430 l. **Fungicide with insecticide:** Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 430 l.

Seed: Sugar beet: Klein E sown at 5.6 kg.
Potatoes: Pentland Crown.

Cultivations, etc.:-

- Sugar beet:** Magnesian limestone applied: 26 Oct, 1971. Deep-tine cultivated twice: 1 Nov, 17 Dec. N and PK applied: 22 Mar, 1972. Mg applied: 23 Mar. Seed drilled: 24 Mar. Weedkiller applied: 3 May. Singled: 22 - 23 May. Boron spray applied: 9 June. Insecticide applied: 29 June. Lifted: 6 - 7 Nov,

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Potatoes: Deep-tine cultivated twice: 1 Nov, 1971, 17 Dec. NPK applied: 29 Mar, 1972. Treatments applied to Series II, all potato series rotary cultivated and potatoes planted: 17 Apr. Weedkiller applied: 11 May. Fungicide applied: 5 July. Fungicide with insecticide applied: 28 July. Haulm mechanically destroyed: Series II: 6 Sept, Series III and IV: 24 Aug. Lifted: Series III and IV: 12 - 14 Sept, Series II: 26 Sept.

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

Standard errors per plot.

Potatoes: Total tubers, tonnes/hectare: 2.37 or 7.3% (18 d.f.)
Sugar beet: Roots (washed), tonnes/hectare: 2.11 or 5.4% (18 d.f.)
Total sugar, tonnes/hectare: 0.414 or 5.9% (18 d.f.)

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TABLES OF MEANS

POTATOES

RATE OF A.I: KG/HA

	2.8	6.0	11.0	Mean
TOTAL TUBERS: TONNES/HECTARE				
NEMATICIDE 1972				
A	33.5	33.7	37.0	34.7
C	30.4	20.1	29.7	30.1
D	36.1	38.0	35.1	36.4
Mean	33.3	33.9	33.9	33.7

0 22.8

Grand mean: 32.6

STANDARD ERRORS OF DIFFERENCES

NEMATICIDE	RATE	NEMATICIDE RATE & 0
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1.12	1.12	1.94
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PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

NEMATICIDE 1972

A	85.8	83.5	87.7	85.7
C	87.3	86.7	84.8	86.2
D	90.6	86.1	86.2	87.6
Mean	87.9	85.4	86.2	86.5

0 82.9

Grand mean: 86.1

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SUGAR BEET

ROOTS (WASHED): TONNES/HECTARE

RATE OF A.I: KG/HA

	2.8	6.0	11.0	Mean
NEMATICIDE 1971				
A	40.3	38.7	38.6	39.2
D	37.8	41.0	36.2	38.4
N	39.7	38.4	40.9	39.7
Mean	39.3	39.4	38.6	39.1

0 37.5

Grand mean: 38.9

STANDARD ERRORS OF DIFFERENCES

NEMATICIDE	RATE	NEMATICIDE RATE & 0
1.00	1.00	0.73

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SUGAR BEET

RATE OF A.I: KG/HA

	2.8	6.0	11.0	Mean
SUGAR %				
NEMATICIDE 1971				
A	18.1	17.7	18.2	18.0
D	17.8	18.1	17.9	17.9
N	17.6	17.9	18.0	17.9
Mean	17.9	17.9	18.0	17.9

□ 18.0

Grand mean: 17.9

TOTAL SUGAR: TONNES/HECTARE

NEMATICIDE 1971

A	7.32	6.85	7.04	7.07
D	6.73	7.41	6.49	6.88
N	7.01	6.86	7.37	7.08
Mean	7.02	7.04	6.97	7.01

□ 6.74

Grand mean: 6.98

STANDARD ERRORS OF DIFFERENCES

NEMATICIDE	RATE	NEMATICIDE RATE & □
0.195	0.195	0.338