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Yields of the Field Experiments 1975

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

Rothamsted Research

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75/W/CS/35

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) |
|-------|------------|---------------------------|
| ----- | ----- | ----- |
| 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