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Yields of the Field Experiments 1981

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81/W/CS/174 Sowing Dates and Ccn - S. Oats

Rothamsted Research

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81/W/CS/174

SOWING DATES AND CCN

Object: To study the residual effects of sowing date, a nematicide, a soil sterilant and previous cropping on the incidence of cereal cyst-nematode (*Heterodera avenae*) (CCN) and on the yield of s. oats in a soil known to contain a fungal parasite of the nematode - Woburn, Butt Close.

Sponsor: B.R. Kerry.

The seventh year, s. oats.

For previous years see 75/W/M/1 and 76-80/W/CS/174.

Design: Single replicate of 36 plots split into 2.

Whole plot dimensions: 2.13 x 6.70.

Treatments: All combinations of:-

Whole plots

1. CROP(76) Crop (cumulative 1975-76):
WHEAT
BARLEY
OATS
2. SOW DATE(76) Sowing date (cumulative 1975-76):
AUTUMN
SPRING
3. NEMACIDE(78) Nematicide (cumulative 1975-78):
NONE None
OXAMYL Oxamyl at 8.8 kg
4. CROP(78) Crop in 1977 & 1978 (all spring sown)(all spring
oats in 1979-81):
WHEAT
BARLEY
OATS

Sub plots

5. STERILNT Sterilant:
NONE None
FORMALIN Formalin at 3000 l in 109000 l. To SOW DATE
SPRING in 1976 and 1978 only. To SOW DATE
AUTUMN in 1977 only.

Basal applications: Manures: (20:10:10) at 500 kg, N at 70 kg as 'Nitro-Chalk'. Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l) in 280 l.

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Irrigation (mm water):

| | |
|---------|------|
| 12 June | 15 |
| 19 June | 20 |
| 25 June | 20 |
| 1 July | 12.5 |
| 2 July | 12.5 |
| 9 July | 23 |
| 16 July | 23 |
| 30 July | 22 |
| Total | 148 |

Seed: Peniarth, sown at 180 kg.

Cultivations, etc.: - Ploughed: 5 Jan, 1981. NPK applied: 27 Feb.
 Spring-tine cultivated with crumbler attached: 27 Feb, 6 Apr. Seed
 sown: 8 Apr. Weedkillers applied: 14 May. N applied: 20 May. Combine
 harvested: 28 Aug.

NOTE: Numbers of cereal cyst-nematodes in soil in April were counted.

GRAIN TONNES/HECTARE

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

| | | | | |
|--------------|--------|--------|------|------|
| SOW DATE(76) | AUTUMN | SPRING | MEAN | |
| CROP(76) | | | | |
| WHEAT | 2.31 | 2.49 | 2.40 | |
| BARLEY | 2.41 | 2.59 | 2.50 | |
| OATS | 2.51 | 2.40 | 2.46 | |
| MEAN | 2.41 | 2.49 | 2.45 | |
| NEMACIDE(78) | NONE | OXAMYL | MEAN | |
| CROP(76) | | | | |
| WHEAT | 2.42 | 2.38 | 2.40 | |
| BARLEY | 2.45 | 2.55 | 2.50 | |
| OATS | 2.46 | 2.45 | 2.46 | |
| MEAN | 2.44 | 2.46 | 2.45 | |
| NEMACIDE(78) | NONE | OXAMYL | MEAN | |
| SOW DATE(76) | | | | |
| AUTUMN | 2.39 | 2.43 | 2.41 | |
| SPRING | 2.50 | 2.49 | 2.49 | |
| CROP(78) | WHEAT | BARLEY | OATS | MEAN |
| CROP(76) | | | | |
| WHEAT | 2.31 | 2.58 | 2.31 | 2.40 |
| BARLEY | 2.42 | 2.53 | 2.54 | 2.50 |
| OATS | 2.49 | 2.66 | 2.22 | 2.46 |
| MEAN | 2.41 | 2.59 | 2.36 | 2.45 |

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GRAIN TONNES/HECTARE

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

| | | | | |
|--------------|--------|----------|--------|--------|
| CROP(78) | WHEAT | BARLEY | OATS | MEAN |
| SOW DATE(76) | | | | |
| AUTUMN | 2.44 | 2.48 | 2.30 | 2.41 |
| SPRING | 2.37 | 2.70 | 2.41 | 2.49 |
| MEAN | 2.41 | 2.59 | 2.36 | 2.45 |
| CROP(78) | WHEAT | BARLEY | OATS | MEAN |
| NEMACIDE(78) | | | | |
| NONE | 2.48 | 2.51 | 2.34 | 2.44 |
| OXAMYL | 2.33 | 2.68 | 2.37 | 2.46 |
| MEAN | 2.41 | 2.59 | 2.36 | 2.45 |
| STERILNT | NONE | FORMALIN | MEAN | |
| CROP(76) | | | | |
| WHEAT | 2.47 | 2.33 | 2.40 | |
| BARLEY | 2.59 | 2.40 | 2.50 | |
| OATS | 2.51 | 2.40 | 2.46 | |
| MEAN | 2.53 | 2.38 | 2.45 | |
| STERILNT | NONE | FORMALIN | MEAN | |
| SOW DATE(76) | | | | |
| AUTUMN | 2.50 | 2.32 | 2.41 | |
| SPRING | 2.56 | 2.43 | 2.49 | |
| MEAN | 2.53 | 2.38 | 2.45 | |
| STERILNT | NONE | FORMALIN | MEAN | |
| NEMACIDE(78) | | | | |
| NONE | 2.60 | 2.28 | 2.44 | |
| OXAMYL | 2.45 | 2.47 | 2.46 | |
| MEAN | 2.53 | 2.38 | 2.45 | |
| STERILNT | NONE | FORMALIN | MEAN | |
| CROP(78) | | | | |
| WHEAT | 2.48 | 2.33 | 2.41 | |
| BARLEY | 2.71 | 2.47 | 2.59 | |
| OATS | 2.38 | 2.33 | 2.36 | |
| MEAN | 2.53 | 2.38 | 2.45 | |
| SOW DATE(76) | AUTUMN | | SPRING | |
| NEMACIDE(78) | NONE | OXAMYL | NONE | OXAMYL |
| CROP(76) | | | | |
| WHEAT | 2.34 | 2.28 | 2.50 | 2.48 |
| BARLEY | 2.27 | 2.54 | 2.62 | 2.55 |
| OATS | 2.55 | 2.48 | 2.37 | 2.43 |

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GRAIN TONNES/HECTARE

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

| | | | | | | | |
|--------------|--------|----------|------|--------|----------|--------|----------|
| SOW DATE(76) | AUTUMN | | | | SPRING | | |
| CROP(78) | WHEAT | BARLEY | OATS | | WHEAT | BARLEY | OATS |
| CROP(76) | | | | | | | |
| WHEAT | 2.29 | 2.50 | 2.13 | | 2.33 | 2.65 | 2.49 |
| BARLEY | 2.38 | 2.32 | 2.51 | | 2.46 | 2.74 | 2.56 |
| OATS | 2.66 | 2.62 | 2.26 | | 2.31 | 2.70 | 2.18 |
| NEMACIDE(78) | NONE | | | | OXAMYL | | |
| CROP(78) | WHEAT | BARLEY | OATS | | WHEAT | BARLEY | OATS |
| CROP(76) | | | | | | | |
| WHEAT | 2.30 | 2.50 | 2.47 | | 2.33 | 2.66 | 2.15 |
| BARLEY | 2.53 | 2.33 | 2.47 | | 2.31 | 2.73 | 2.60 |
| OATS | 2.61 | 2.69 | 2.08 | | 2.37 | 2.63 | 2.36 |
| NEMACIDE(78) | NONE | | | | OXAMYL | | |
| CROP(78) | WHEAT | BARLEY | OATS | | WHEAT | BARLEY | OATS |
| SOW DATE(76) | | | | | | | |
| AUTUMN | 2.58 | 2.24 | 2.34 | | 2.31 | 2.72 | 2.26 |
| SPRING | 2.38 | 2.77 | 2.34 | | 2.36 | 2.63 | 2.49 |
| SOW DATE(76) | AUTUMN | | | SPRING | | | |
| STERILNT | NONE | FORMALIN | | NONE | FORMALIN | | |
| CROP(76) | | | | | | | |
| WHEAT | 2.32 | 2.29 | | 2.62 | 2.36 | | |
| BARLEY | 2.62 | 2.19 | | 2.57 | 2.60 | | |
| OATS | 2.55 | 2.48 | | 2.48 | 2.32 | | |
| NEMACIDE(78) | NONE | | | OXAMYL | | | |
| STERILNT | NONE | FORMALIN | | NONE | FORMALIN | | |
| CROP(76) | | | | | | | |
| WHEAT | 2.58 | 2.26 | | 2.36 | 2.40 | | |
| BARLEY | 2.63 | 2.26 | | 2.55 | 2.54 | | |
| OATS | 2.60 | 2.32 | | 2.43 | 2.48 | | |
| NEMACIDE(78) | NONE | | | OXAMYL | | | |
| STERILNT | NONE | FORMALIN | | NONE | FORMALIN | | |
| SOW DATE(76) | | | | | | | |
| AUTUMN | 2.54 | 2.24 | | 2.46 | 2.40 | | |
| SPRING | 2.67 | 2.32 | | 2.44 | 2.54 | | |
| CROP(78) | WHEAT | | | BARLEY | | OATS | |
| STERILNT | NONE | FORMALIN | | NONE | FORMALIN | NONE | FORMALIN |
| CROP(76) | | | | | | | |
| WHEAT | 2.43 | 2.20 | | 2.60 | 2.56 | 2.39 | 2.23 |
| BARLEY | 2.66 | 2.18 | | 2.59 | 2.47 | 2.53 | 2.54 |
| OATS | 2.36 | 2.62 | | 2.95 | 2.37 | 2.23 | 2.22 |
| CROP(78) | WHEAT | | | BARLEY | | OATS | |
| STERILNT | NONE | FORMALIN | | NONE | FORMALIN | NONE | FORMALIN |
| SOW DATE(76) | | | | | | | |
| AUTUMN | 2.59 | 2.30 | | 2.52 | 2.45 | 2.38 | 2.22 |
| SPRING | 2.37 | 2.37 | | 2.91 | 2.49 | 2.39 | 2.43 |

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GRAIN TONNES/HECTARE

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

| CROP(78) STERILNT NEMACIDE(78) | WHEAT | | BARLEY | | OATS | |
|--------------------------------------|-------|----------|--------|----------|------|----------|
| | NONE | FORMALIN | NONE | FORMALIN | NONE | FORMALIN |
| NONE | 2.67 | 2.29 | 2.72 | 2.29 | 2.42 | 2.26 |
| OXAMYL | 2.29 | 2.38 | 2.71 | 2.64 | 2.34 | 2.40 |

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

| TABLE | CROP(76) | SOW DATE(76) | NEMACIDE(78) | CROP(78) |
|-------|----------|--------------|--------------|----------|
| SED | 0.070 | 0.057 | 0.057 | 0.070 |

| TABLE | STERILNT | CROP(76) SOW DATE(76) | CROP(76) NEMACIDE(78) | SOW DATE(76) NEMACIDE(78) |
|-------|----------|--------------------------|--------------------------|------------------------------|
| SED | 0.083 | 0.099 | 0.099 | 0.081 |

| TABLE | CROP(76) CROP(78) | SOW DATE(76) CROP(78) | NEMACIDE(78) CROP(78) | CROP(76) STERILNT |
|--|----------------------|--------------------------|--------------------------|----------------------|
| SED | 0.122 | 0.099 | 0.099 | 0.124 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: CROP(76) | | | | 0.145 |

| TABLE | SOW DATE(76) STERILNT | NEMACIDE(78) STERILNT | CROP(78) STERILNT | CROP(76) SOW DATE(76) NEMACIDE(78) |
|--|--------------------------|--------------------------|----------------------|--|
| SED | 0.101 | 0.101 | 0.124 | 0.140 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: SOW DATE(76) | | | | 0.118 |
| NEMACIDE(78) | | 0.118 | | |
| CROP(78) | | | 0.145 | |

| TABLE | CROP(76) SOW DATE(76) CROP(78) | CROP(76) NEMACIDE(78) CROP(78) | SOW DATE(76) NEMACIDE(78) CROP(78) | CROP(76) SOW DATE(76) STERILNT |
|---|--------------------------------------|--------------------------------------|--|--------------------------------------|
| SED | 0.172 | 0.172 | 0.140 | 0.175 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: CROP(76).SOW DATE(76) | | | | 0.205 |

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GRAIN TONNES/HECTARE

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

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

| TABLE | CROP(76) NEMACIDE(78) STERILNT | SOW DATE(76) NEMACIDE(78) STERILNT | CROP(76) CROP(78) STERILNT | SOW DATE(76) CROP(78) STERILNT |
|--|--------------------------------------|--|----------------------------------|--------------------------------------|
| SED | 0.175 | 0.143 | 0.215 | 0.175 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | | |
| | CROP(76).NEMACIDE(78) | | | |
| | 0.205 | | | |
| | SOW DATE(76).NEMACIDE(78) | | | |
| | | 0.167 | | |
| | CROP(76).CROP(78) | | | |
| | | | 0.250 | |
| | SOW DATE(76).CROP(78) | | | |
| | | | | 0.205 |

| TABLE | NEMACIDE(78) CROP(78) STERILNT |
|--|--------------------------------------|
| SED | 0.175 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | |
| | NEMACIDE(78).CROP(78) |
| | 0.205 |

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

| STRATUM | DF | SE | CV% |
|---------|----|-------|------|
| WP | 4 | 0.172 | 7.0 |
| WP.SP | 16 | 0.354 | 14.5 |

GRAIN MEAN DM% 75.6

SUB PLOT AREA HARVESTED 0.00041