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85/W/CS/293 Nitrification Inhibitors - W. Oats

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85/W/CS/293

NITRIFICATION INHIBITORS

Object: To study the effects of nitrification inhibitors on the yield and nitrogen uptake of w. oats - Woburn The Pigtle.

Sponsors: G.A. Rodgers, A. Penny.

The fourth year, w. oats.

For previous years see 82/W/WW/3 and 83-84/W/CS/293.

Design: 2 randomised blocks of 21 plots.

Whole plot dimensions: 4.0 x 12.0.

Treatments, applied cumulatively to 1982, 1983 and 1984:

All combinations of:-

1. I FORM Nitrification inhibitors applied just before final seedbed cultivations:

| | |
|----------|---------------|
| DICYANDI | Dicyandiamide |
| ETRIDIAZ | Etridiazole |
| NITRAPYR | Nitrapyrin |

2. I RATE Rates of inhibitors:

| | |
|--------|---|
| SINGLE | Single (1.0 kg for etridiazole and nitrapyrin; 10.0 kg for dicyandiamide) |
| DOUBLE | Double (2.0 kg for etridiazole and nitrapyrin; 20.0 kg for dicyandiamide) |

3. N RATE Rates of nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk' (26% N):

0
35
70

plus 3 extra treatments given nitrogen fertilizer in spring only (kg N) as 'Nitro-Chalk' (26% N).

| |
|----------|
| N RATE X |
| 0 |
| 35 |
| 70 |

NOTE: Nitrification inhibitors were applied on 11 Oct, 1984.

85/W/CS/293

Basal applications: Manure: 0.18 kg Mn as 'Vytel' applied in 250 l with the weedkillers and the growth regulator. Weedkillers: Paraquat at 0.30 kg ion in 250 l; clopyralid at 0.07 kg with bromoxynil at 0.34 kg applied with the manure and the growth regulator. Growth regulator: Chlormequat applied on two occasions, on the first occasion (as 'Power C' at 1.25 l) with the manure and the weedkillers, on the second occasion (as 'Power C' at 4.2 l) with the fungicide. Fungicide: Tridemorph at 0.52 kg in 250 l.

Seed: Panema, sown at 160 kg.

Cultivations, etc.:- Paraquat applied: 18 Sept, 1984. Ploughed: 25 Sept. Autumn treatments applied, harrowed, seed sown: 11 Oct. Spring treatments applied: 9 Apr, 1985. Mn, weedkillers and chlormequat applied: 17 Apr. Chlormequat and the fungicide applied: 26 May. Combine harvested: 23 Aug.

- NOTES: (1) Soil samples were taken in late autumn, then at intervals until April and again before harvest for ammonia and nitrate analyses.
 (2) Plant samples were taken in spring, June and at harvest for estimates of total N and dry matter.

GRAIN TONNES/HECTARE

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

| I FORM N RATE | DICYANDI | ETRIDIAZ | NITRAPYR | MEAN |
|------------------|----------|----------|----------|------|
| 0 | 7.54 | 7.05 | 7.16 | 7.25 |
| 35 | 7.27 | 7.17 | 7.69 | 7.38 |
| 70 | 6.22 | 6.90 | 6.87 | 6.66 |
| MEAN | 7.01 | 7.04 | 7.24 | 7.10 |
| I RATE N RATE | SINGLE | DOUBLE | MEAN | |
| 0 | 7.57 | 6.93 | 7.25 | |
| 35 | 7.28 | 7.48 | 7.38 | |
| 70 | 6.49 | 6.84 | 6.66 | |
| MEAN | 7.11 | 7.08 | 7.10 | |
| I RATE I FORM | SINGLE | DOUBLE | MEAN | |
| DICYANDI | 7.05 | 6.97 | 7.01 | |
| ETRIDIAZ | 6.98 | 7.10 | 7.04 | |
| NITRAPYR | 7.31 | 7.17 | 7.24 | |
| MEAN | 7.11 | 7.08 | 7.10 | |

85/W/CS/293

GRAIN TONNES/HECTARE

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

| I FORM I RATE N RATE | DICYANDI | | ETRIDIAZ | | NITRAPYR | |
|----------------------------|----------|--------|----------|--------|----------|--------|
| | SINGLE | DOUBLE | SINGLE | DOUBLE | SINGLE | DOUBLE |
| 0 | 7.90 | 7.18 | 7.35 | 6.76 | 7.46 | 6.86 |
| 35 | 7.11 | 7.44 | 7.11 | 7.23 | 7.63 | 7.76 |
| 70 | 6.14 | 6.30 | 6.48 | 7.32 | 6.85 | 6.89 |

EXTRA PLOTS

| N RATE X | 0 | 35 | 70 | MEAN |
|----------|------|------|------|------|
| | 7.50 | 7.13 | 6.95 | 7.19 |

GRAND MEAN 7.11

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

| TABLE | N RATE X | N RATE | I FORM | I RATE |
|-------|------------------|------------------|------------------|----------------------------|
| | 0.478 | 0.195 | 0.195 | 0.159 |
| TABLE | N RATE I FORM | N RATE I RATE | I FORM I RATE | N RATE I FORM I RATE |
| SED | 0.338 | 0.276 | 0.276 | 0.478 |

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

| STRATUM | DF | SE | CV% |
|----------------|------|-------|-----|
| BLOCK.WP | 20 | 0.478 | 6.7 |
| GRAIN MEAN DM% | 79.5 | | |

85/W/CS/293

STRAW TONNES/HECTARE

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

| I FORM N RATE | DICYANDI | ETRIDIAZ | NITRAPYR | MEAN |
|------------------|----------|----------|----------|------|
| 0 | 6.39 | 6.37 | 5.17 | 5.98 |
| 35 | 6.09 | 5.87 | 5.71 | 5.89 |
| 70 | 6.33 | 6.59 | 6.68 | 6.53 |
| MEAN | 6.27 | 6.28 | 5.85 | 6.13 |

| I RATE N RATE | SINGLE | DOUBLE | MEAN |
|------------------|--------|--------|------|
| 0 | 5.97 | 5.99 | 5.98 |
| 35 | 5.95 | 5.83 | 5.89 |
| 70 | 6.85 | 6.22 | 6.53 |
| MEAN | 6.26 | 6.01 | 6.13 |

| I RATE I FORM | SINGLE | DOUBLE | MEAN |
|------------------|--------|--------|------|
| DICYANDI | 6.20 | 6.35 | 6.27 |
| ETRIDIAZ | 6.48 | 6.08 | 6.28 |
| NITRAPYR | 6.10 | 5.61 | 5.85 |
| MEAN | 6.26 | 6.01 | 6.13 |

| I FORM I RATE N RATE | DICYANDI SINGLE | DOUBLE | ETRIDIAZ SINGLE | DOUBLE | NITRAPYR SINGLE | DOUBLE |
|----------------------------|--------------------|--------|--------------------|--------|--------------------|--------|
| 0 | 6.49 | 6.29 | 6.24 | 6.51 | 5.19 | 5.16 |
| 35 | 5.50 | 6.68 | 6.29 | 5.44 | 6.06 | 5.35 |
| 70 | 6.60 | 6.06 | 6.90 | 6.28 | 7.05 | 6.31 |

EXTRA PLOTS

| N RATE X | 0 | 35 | 70 | MEAN |
|----------|------|------|------|------|
| | 5.45 | 5.48 | 6.89 | 5.94 |

GRAND MEAN 6.11

STRAW MEAN DM% 80.7

PLOT AREA HARVESTED 0.00244