ROTHAMSTED RESEARCH

Yields of the Field Experiments 1985

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

Rothamsted Research

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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 Pightle.

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.

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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

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GRAIN TONNES/HECTARE

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

I FORM	DICYANDI		ETRIDIAZ		NITRAPYR	
I RATE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE
N RATE						
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

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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	DICYANDI		ETRIDIAZ		NITRAPYR	
I RATE / N RATE	SINGLE	DOUBLE	SINGLE	DOUBLE	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

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