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

Rothamsted Research

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83/W/CS/293

WINTER OATS

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 second year, w. oats.

For previous year see 82/W/WW/3.

Design: 2 randomised blocks of 21 plots.

Whole plot dimensions: 4.0 x 12.0.

Treatments, applied cummulativey to 1982: 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':

0
35
70

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

N RATE X
0
35
70

NOTE: Nitrification inhibitors were applied on 11 Oct, 1982.

Basal applications: Manures: Magnesian limestone at 7.5 t. Weedkillers: Methabenzthiazuron at 1.6 kg in 250 l, dicamba with mecoprop and MCPA (as 'Poly-Farmon' at 5.0 l) in 250 l.

Seed: Panema, sown at 170 kg.

83/W/CS/293

Cultivations, etc.:— Discd: 10 Sept, 1982. Magnesian limestone applied: 15 Sept. Ploughed: 28 Sept. Spring-tine cultivated with crumbler attached twice, seed sown: 11 Oct. Methabenzthiazuron applied: 15 Oct. N treatments applied: 6 Apr, 1983. 'Poly-Farmon' applied: 14 Apr. Combine harvested: 4 Aug.

- NOTES: (1) Soil samples were taken in October, then at intervals until April and again in July for ammonium and nitrate analyses.
(2) Plant samples were taken in April and July and at maturity for estimates of total N and dry matter.

83/W/CS/293
GRAIN TONNES/HECTARE

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

I FORM N RATE	DICYANDI	ETRIDIAZ	NITRAPYR	MEAN
0	6.80	6.55	6.40	6.59
35	6.45	5.95	6.18	6.19
70	4.70	5.69	5.26	5.22
MEAN	5.98	6.06	5.95	6.00

I RATE N RATE	SINGLE	DOUBLE	MEAN
0	6.76	6.41	6.59
35	6.01	6.38	6.19
70	5.19	5.24	5.22
MEAN	5.99	6.01	6.00

I RATE I FORM DICYANDI ETRIDIAZ NITRAPYR	SINGLE	DOUBLE	MEAN
DICYANDI	6.15	5.82	5.98
ETRIDIAZ	5.81	6.32	6.06
NITRAPYR	6.00	5.89	5.95
MEAN	5.99	6.01	6.00

I FORM I RATE N RATE	DICYANDI SINGLE	ETRIDIAZ DOUBLE	ETRIDIAZ SINGLE	NITRAPYR DOUBLE	NITRAPYR SINGLE	DOUBLE
0	7.00	6.60	6.85	6.25	6.43	6.38
35	6.73	6.18	5.35	6.55	5.96	6.40
70	4.73	4.67	5.23	6.14	5.62	4.89

N RATE X	0	35	70	MEAN
	6.87	5.67	4.80	5.78

GRAND MEAN 5.97

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

TABLE	N RATE X	N RATE	I FORM	I RATE
SED	0.753	0.307	0.307	0.251

TABLE	N RATE I FORM	N RATE I RATE	I FORM I RATE	N RATE I FORM I RATE & N RATE X
SED	0.532	0.435	0.435	0.753

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

STRATUM	DF	SE	CV%
BLOCK.WP	20	0.753	12.6

GRAIN MEAN DM% 86.1

83/W/CS/293

STRAW TONNES/HECTARE

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

I FORM N RATE	DICYANDI	ETRIDIAZ	NITRAPYR	MEAN
0	8.63	8.21	6.52	7.79
35	8.30	8.58	8.44	8.44
70	9.45	8.68	9.02	9.05
MEAN	8.79	8.49	7.99	8.43

I RATE N RATE	SINGLE	DOUBLE	MEAN
0	8.13	7.44	7.79
35	8.44	8.44	8.44
70	9.16	8.95	9.05
MEAN	8.58	8.27	8.43

I RATE I FORM	SINGLE	DOUBLE	MEAN
DICYANDI	9.00	8.59	8.79
ETRIDIAZ	9.06	7.92	8.49
NITRAPYR	7.67	8.31	7.99
MEAN	8.58	8.27	8.43

I FORM I RATE N RATE	DICYANDI SINGLE	ETRIDIAZ DOUBLE	ETRIDIAZ SINGLE	NITRAPYR DOUBLE	NITRAPYR SINGLE	DOUBLE
0	9.05	8.21	9.01	7.41	6.34	6.70
35	8.42	8.19	9.13	8.03	7.79	9.09
70	9.52	9.37	9.05	8.32	8.90	9.15

N RATE X	0	35	70	MEAN
	8.07	7.63	9.57	8.42

GRAND MEAN 8.43

STRAW MEAN DM% 83.3

PLOT AREA HARVESTED 0.00244