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82/W/WW/3 Nitrification Inhibitors - Winter Wheat

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82/W/WW/3

WINTER WHEAT

NITRIFICATION INHIBITORS

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

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

Design: 2 randomised blocks of 21 plots.

Whole plot dimensions: 4.0 x 12.0.

Treatments: 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 (2.0 kg for etridiazole and nitrapyrin; 10.0 kg for dicyandiamide)
DOUBLE	Double (4.0 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':

EXTRA
0
35
70

NOTE: Nitrification inhibitors were applied on 7 Oct, 1981.

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Glyphosate at 2.0 kg in 280 l. Chlortoluron at 5.6 l in 280 l. Fungicides: Benomyl at 0.24 kg in 280 l applied with the growth regulator. Carbendazim with maneb and tridemorph (as 'Cosmic' at 4 kg) in 280 l applied with captafol at 1.2 kg and insecticide. Insecticide: Pirimicarb at 0.14 kg. Growth regulator: Chlormequat at 1.7 l.

Seed: Avalon, sown at 190 kg.

Cultivations, etc.: - Glyphosate applied: 15 Aug, 1981. Dead grass burnt: 9 Sept. Ploughed: 10 Sept. Disced: 28 Sept, 6 Oct. PK applied: 29 Sept. Spring-tine cultivated with crumbler attached: 7 Oct.

82/W/WW/3

Seed sown: 8 Oct. Chlortoluron applied: 15 Oct. Growth regulator and benomyl applied: 27 Apr, 1982. 'Cosmic', captafol and insecticide applied: 15 June. Combine harvested: 17 Aug. Previous crops: Grass 1980 and 1981.

- NOTES: (1) Soil samples were taken in October and then at 21 day intervals until April and again in July for ammonium and nitrate analyses.
 (2) Plant samples were taken in April, July and at maturity for estimates of total N and dry matter.
 (3) Uptake of ^{15}N labelled dicyandiamide was measured in July.

GRAIN TONNES/HECTARE

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

I FORM N RATE	DICYANDI	ETRIDIAZ	NITRAPYR	MEAN
0	9.60	9.29	9.49	9.46
35	9.39	9.00	9.06	9.15
70	9.36	9.56	9.14	9.35
MEAN	9.45	9.29	9.23	9.32
I RATE N RATE	SINGLE	DOUBLE	MEAN	
0	9.45	9.47	9.46	
35	9.17	9.13	9.15	
70	9.17	9.54	9.35	
MEAN	9.26	9.38	9.32	
I RATE I FORM	SINGLE	DOUBLE	MEAN	
DICYANDI	9.03	9.87	9.45	
ETRIDIAZ	9.55	9.02	9.29	
NITRAPYR	9.21	9.25	9.23	
MEAN	9.26	9.38	9.32	
N RATE	I RATE I FORM	SINGLE	DOUBLE	
0	DICYANDI	9.14	10.05	
	ETRIDIAZ	9.63	8.95	
	NITRAPYR	9.59	9.39	
35	DICYANDI	9.09	9.69	
	ETRIDIAZ	9.02	8.98	
	NITRAPYR	9.40	8.72	
70	DICYANDI	8.84	9.88	
	ETRIDIAZ	10.01	9.12	
	NITRAPYR	8.66	9.62	
EXTRA	0	35	70	MEAN
	9.70	9.27	9.00	9.33
GRAND MEAN	9.32			

82/W/WW/3

GRAIN TONNES/HECTARE

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

TABLE	N RATE	I FORM	I RATE	N RATE I FORM
SED	0.193	0.193	0.157	0.333
TABLE	N RATE I RATE	I FORM I RATE	N RATE I FORM I RATE & EXTRA	EXTRA
SED	0.272	0.272	0.472	0.472

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

STRATUM	DF	SE	CV%
BLOCK.WP	20	0.472	5.1

GRAIN MEAN DM% 81.5

STRAW TONNES/HECTARE

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

I FORM N RATE	DICYANDI	ETRIDIAZ	NITRAPYR	MEAN
0	6.00	5.12	5.23	5.45
35	5.06	4.42	4.66	4.71
70	5.84	6.05	5.68	5.86
MEAN	5.63	5.20	5.19	5.34
I RATE N RATE	SINGLE	DOUBLE	MEAN	
0	5.42	5.48	5.45	
35	4.70	4.73	4.71	
70	5.36	6.35	5.86	
MEAN	5.16	5.52	5.34	
I RATE I FORM	SINGLE	DOUBLE	MEAN	
DICYANDI	5.00	6.26	5.63	
ETRIDIAZ	5.28	5.11	5.20	
NITRAPYR	5.20	5.19	5.19	
MEAN	5.16	5.52	5.34	

82/W/WW/3

STRAW TONNES/HECTARE

***** TABLES OF MEANS

N RATE	I RATE I FORM	SINGLE	DOUBLE	
0	DICYANDI	5.64	6.36	
	ETRIDIAZ	5.23	5.01	
	NITRAPYR	5.41	5.06	
35	DICYANDI	4.69	5.44	
	ETRIDIAZ	4.98	3.85	
	NITRAPYR	4.43	4.90	
70	DICYANDI	4.69	6.99	
	ETRIDIAZ	5.64	6.47	
	NITRAPYR	5.76	5.61	
EXTRA	0	35	70	MEAN
	5.54	4.37	5.30	5.07
GRAND MEAN	5.30			
STRAW MEAN DM%	73.5			
PLOT AREA HARVESTED	0.00252			