ROTHAMSTED RESEARCH

Yields of the Field Experiments 1981

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81/R/WW/9 Nitrification Inhibitors and Soil N - W. Wheat

Rothamsted Research

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81/R/WW/9

WINTER WHEAT

NITRIFICATION INHIBITORS AND SOIL N

Object: To study the effects of nitrification inhibitors, applied before sowing on the leaching of nitrogen in the soil and on the yield of w. wheat - Gt. Harpenden I.

Sponsor: G.A. Rodgers.

Design: 2 randomised blocks of 21 plots.

Whole plot dimensions: 2.74 x 11.6.

Treatments: All combinations of:-

1. N INHIB — Nitrification inhibitors before sowing:

NONE	None
DICYAN 1	Dicyandiamide at 5 kg
DICYAN 2	Dicyandiamide at 20 kg
ETRIDI 1	Etridiazole at 0.5 kg
ETRIDI 2	Etridiazole at 2.0 kg
NITRAP 1	Nitrapyrin at 0.5 kg
NITRAP 2	Nitrapyrin at 2.0 kg

2. SPRING N — Nitrogen fertiliser (kg N) in spring on 16 April, 1981:

0
35
70

NOTE: Nitrification inhibitors were applied on 24 Sept, 1980.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Isoproturon at 2.5 kg in 250 l. Mecoprop with bromoxynil and ioxynil (as 'Brittox' at 3.7 l) in 250 l. Fungicides: Prochloraz at 0.4 l applied with maneb at 1.2 kg and zineb at 0.13 kg in 250 l.

Seed: Flanders, sown at 190 kg.

Cultivations, etc.:- Subsoiled four times: 13 June, 1980. Chisel ploughed twice: 16 June. Rotary cultivated: 18 June, 8 July, 7 Aug, 18 Sept. Rotary harrowed: 24 Sept. Seed sown: 29 Sept. Isoproturon applied: 4 Oct. 'Brittox' applied: 21 Apr, 1981. Fungicides applied: 22 June. Combine harvested: 26 Aug. Previous crops: Grass 1979 and 1980.

NOTES: (1) Soil cores were taken to 20 cms, at 21 day intervals between September and April, and to 1 m in January, and analysed for ammonium and nitrate concentrations.

(2) Dicyandiamide concentrations were measured on several occasions after applications. Total N was measured in plants in April, and ears were counted in June. Harvested grain and straw was analysed for total N.

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81/R/WW/9

GRAIN TONNES/HECTARE

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

SPRING N / N INHIB	0	35	70	MEAN
NONE	4.55	5.87	7.10	5.84
DICYAN 1	4.69	6.62	7.21	6.17
DICYAN 2	5.30	6.40	7.18	6.29
ETRIDI 1	4.36	6.13	7.46	5.98
ETRIDI 2	5.08	5.84	7.14	6.02
NITRAP 1	5.10	6.40	6.48	6.00
NITRAP 2	4.88	6.17	6.75	5.93
MEAN	4.85	6.20	7.05	6.03

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

TABLE	N INHIB	SPRING N	N INHIB SPRING N
SED	0.282	0.185	0.488

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

STRATUM	DF	SE	CV%
BLOCK.WP	20	0.488	8.1

GRAIN MEAN DM% 86.0

STRAW TONNES/HECTARE

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

SPRING N / N INHIB	0	35	70	MEAN
NONE	2.32	3.19	3.49	3.00
DICYAN 1	2.34	2.81	3.49	2.88
DICYAN 2	2.49	3.20	3.67	3.12
ETRIDI 1	2.36	3.07	3.99	3.14
ETRIDI 2	2.80	2.67	3.83	3.10
NITRAP 1	2.36	3.31	3.51	3.06
NITRAP 2	2.28	3.34	3.29	2.97
MEAN	2.42	3.09	3.61	3.04

STRAW MEAN DM% 88.2

PLOT AREA HARVESTED 0.00156

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