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80/R/WW/2 and 80/W/WW/2 Winter Wheat Aqueous N and Nitrification Inhibitors

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80/R/WW/2 and 80/W/WW/2

WINTER WHEAT

AQUEOUS N AND NITRIFICATION INHIBITORS

Object: To study the effects of adding nitrification inhibitors to aqueous urea on the yield and nitrogen uptake of w. wheat - Rothamsted (R) Gt. Knott (III) and Woburn (W) Great Hill Bottom I.

Sponsors: F.V. Widdowson, A. Penny, G.A. Rodgers.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 4.27 x 12.2.

Treatments: All combinations of:-

1. A S N Nitrogen fertilisers (kg N) in autumn and spring:
 - 100I + 100 100 in autumn, injected as aqueous urea, 100 in spring as 'Nitro-Chalk'
 - 100I + 150 100 in autumn injected as aqueous urea, 150 in spring as 'Nitro-Chalk'

2. N INHIB Nitrification inhibitors added to aqueous urea:
 - NONE None
 - DIMEXAN Dimexan (dimethyl xanthate) at 3.8 kg
 - NITRAPYR Nitrapyrin at 1.4 kg
 - QUINOL Quinol (hydroquinone) at 3.8 kg
 - STC+PEX Sodium trithiocarbonate (equivalent to 3.2 kg carbon disulphide) plus potassium ethyl xanthate at 3.8 kg
 - THIRAM Thiram at 3.8 kg

plus six extra plots given 'Nitro-Chalk' only (kg N):

EXTRA

- 0
- NC 50
- NC 100
- NC 150
- NC 200
- NC 250

NOTE: 'Nitro-Chalk' dressings were divided, one-third in February, remainder in April.

Basal applications:

- Gt. Knott III (R): Manures: (0:20:20) at 310 kg, combine drilled.
Weedkillers: Paraquat at 0.56 kg ion in 220 l. Methabenzthiazuron at 1.6 kg in 220 l. Growth regulator: Chlormequat at 1.7 l in 250 l.
Insecticide: Demeton-s-methyl 0.24 l in 250 l.
- Gt. Hill Bottom I (W): Manures: (0:20:20) at 250 kg.
Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 250 l). Growth regulator: Chlormequat at 1.4 l in 280 l.

Seed: Gt. Knott III (R): Flanders, sown at 200 kg.
Gt. Hill Bottom I (W): Flanders, sown at 190 kg.

80/R/WW/2 and 80/W/WW/2

Cultivations, etc.:-

Gt. Knott III (R): Aqueous N with inhibitors injected: 8 Oct, 1979.
 Paraquat applied: 15 Oct. Disc harrowed twice, seed sown: 18 Oct.
 Methabenzthiazuron applied: 20 Oct. First 'Nitro-Chalk' dressing
 applied: 19 Feb, 1980. Remaining 'Nitro-Chalk' applied: 8 Apr.
 Growth regulator applied: 7 May. Insecticide applied: 23 June.
 Combine harvested: 22 Aug. Previous crops: S. barley 1978, w. oats
 1979.

Gt. Hill Bottom I (W): Heavy spring-tine cultivated: 12 Sept, 1979.
 Rotary cultivated: 21 Sept. PK applied: 27 Sept. Aqueous N with
 inhibitor injected: 9 Oct. Seed sown: 18 Oct. First 'Nitro-Chalk'
 dressing applied: 18 Feb, 1980. Weedkillers applied: 3 Mar.
 Remaining 'Nitro-Chalk' applied: 2 Apr. Growth regulator applied: 24
 Apr. Combine harvested: 27 Aug. Previous crops: Potatoes and beans
 1978, oats 1979.

NOTE: Soil samples were taken at monthly intervals, November to July for
 measurements of nitrate and ammonia.

80/R/WW/2 GT. KNOTT III

GRAIN TONNES/HECTARE

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

N INHIB A S N	NONE	DIMEXAN	NITRAPYR	QUINOL	STC+PEX	THIRAM	MEAN
100I+100	7.94	7.37	7.51	7.32	7.45	7.41	7.50
100I+150	7.54	7.53	8.16	7.81	8.49	8.18	7.95
MEAN	7.74	7.45	7.83	7.57	7.97	7.79	7.72
EXTRA	0	NC 50	NC 100	NC 150	NC 200	NC 250	MEAN
	3.37	5.60	6.74	7.44	8.24	7.79	6.53

GRAND MEAN 7.33

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

TABLE	EXTRA	A S N	N INHIB	A S N N INHIB & EXTRA
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SED	0.252	0.103	0.178	0.252

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.252	3.4

GRAIN MEAN DM% 84.7

PLOT AREA HARVESTED 0.00279

80/W/WW/2 GT. HILL BOTTOM I

GRAIN TONNES/HECTARE

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

N INHIB A S N	NONE	DIMEXAN	NITRAPYR	QUINOL	STC+PEX	THIRAM	MEAN
100I+100	6.45	6.32	5.84	6.09	5.70	6.14	6.09
100I+150	6.30	6.40	6.23	5.85	6.53	6.54	6.31
MEAN	6.37	6.36	6.03	5.97	6.11	6.34	6.20
EXTRA	0	NC 50	NC 100	NC 150	NC 200	NC 250	MEAN
	3.23	4.45	5.98	6.54	6.23	6.19	5.44

GRAND MEAN 5.95

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

TABLE	EXTRA	A S N	N INHIB	A S N N INHIB & EXTRA
SED	0.480	0.196	0.340	0.480

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.480	8.1

GRAIN MEAN DM% 83.6

PLOT AREA HARVESTED 0.00279