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78/R/B/9 Nitrification Inhibitor and Foliar Diseases - Barley

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78/R/B/9

SPRING BARLEY

NITRIFICATION INHIBITOR AND FOLIAR DISEASES

Object: To study the effects of adding a nitrification inhibitor to a liquid nitrogen fertiliser on the incidence and control of foliar diseases, N uptake and yield - Summerdells II.

Sponsors: J.F. Jenkyn, M.E. Finney, F.V. Widdowson, A. Penny, J. Ashworth.

Design: 2 randomised blocks of 10 plots split into 4.

Whole plot dimensions: 4.27 x 33.2.

Treatments: All combinations of:-

Whole plots

- | | |
|-----------|------------------------------------------------------------------------------------------------------------------------------------|
| 1. N RATE | Amounts of nitrogen fertiliser (kg N): |
| 70 | |
| 110 | |
| 2. N FORM | Form of nitrogen fertiliser and nitrification inhibitor: |
| LIQUID 0 | Liquid fertiliser (urea/ammonium nitrate, 26% N),
injected before sowing, no nitrification inhibitor |
| LIQUID I | Liquid fertiliser (urea/ammonium nitrate, 26% N),
injected before sowing, with nitrapyrin added as
a nitrification inhibitor |
| NC 0 E | Solid fertiliser ('Nitro-Chalk', 25% N) applied to seedbed,
no nitrification inhibitor |
| NC 0 L | Solid fertiliser ('Nitro-Chalk' 25% N), top-dressed, no
nitrification inhibitor |
| NC 0 EL | Solid fertiliser ('Nitro-Chalk' 25% N), half to seedbed,
half top-dressed, no nitrification inhibitor |

Sub plots

- | | |
|-------------|----------------------------------------------------|
| 3. MILDEW F | Mildew fungicide: |
| NONE | None (duplicated) |
| TRIDEMOR | Tridemorph on 7 June, 1978 and 6 July (duplicated) |

- NOTES: (1) A proposed test of benodanil fungicide was not made because there was little rust.
(2) Tridemorph was applied at 0.53 kg in 340 l.
(3) Sides of plots were separated by a 2 m strip of Mazurka sprayed tridemorph at above rate on 14 June.
(4) Liquid nitrogen was applied by injectors with tines 30 cm apart 10 cm deep.
(5) Nitrapyrin was applied at 1 kg.
(6) Nitrogen fertiliser was applied to N FORM LIQUID 0 and LIQUID I and NC 0 E on 6 Apr, and to NC 0 L and NC 0 EL on 22 May.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

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Seed: Zephyr, sown at 160 kg.

Cultivations, etc.:— Ploughed: 23 Nov, 1977. Spring-tine cultivated twice: 15 Mar, 1978. Heavy spring-tine cultivated, power harrowed, seed sown: 17 Apr. Weedkiller applied: 26 May. Combine harvested: 8 Sept. Previous crops: Oats 1976, barley 1977.

NOTES: Plant emergence counts were made. Mildew and brown rust were assessed during the season. Counts of ears, numbers of grains per ear and thousand grain weights were made. The crop was sampled for nitrogen and the soil for nitrification of ammonia in the injected bands.

GRAIN TONNES/HECTARE

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

N FORM N RATE	LIQUID O	LIQUID I	NC O E	NC O L	NC O EL	MEAN
70	5.19	5.23	4.99	5.24	5.42	5.22
110	5.29	5.30	5.28	5.24	5.49	5.32
MEAN	5.24	5.26	5.14	5.24	5.46	5.27
MILDEW F N RATE	NONE	TRIDEMOR	MEAN			
70	4.93	5.50	5.22			
110	4.97	5.67	5.32			
MEAN	4.95	5.59	5.27			
MILDEW F N FORM	NONE	TRIDEMOR	MEAN			
LIQUID O	4.93	5.55	5.24			
LIQUID I	5.06	5.46	5.26			
NC O E	4.84	5.44	5.14			
NC O L	4.87	5.61	5.24			
NC O EL	5.05	5.86	5.46			
MEAN	4.95	5.59	5.27			
N RATE	MILDEW F N FORM	NONE	TRIDEMOR			
70	LIQUID O	4.86	5.53			
	LIQUID I	5.01	5.45			
	NC O E	4.71	5.27			
	NC O L	5.05	5.43			
	NC O EL	5.03	5.82			
110	LIQUID O	5.01	5.58			
	LIQUID I	5.12	5.48			
	NC O E	4.96	5.61			
	NC O L	4.69	5.79			
	NC O EL	5.07	5.90			

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

TABLE	N RATE	N FORM	MILDEW F	N RATE N FORM
SED	0.092	0.145	0.063	0.205

TABLE	N RATE MILDEW F	N FORM MILDEW F	N RATE N FORM MILDEW F
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SED	0.111	0.176	0.249
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
N RATE	0.089		
N FORM		0.141	
N RATE.N FORM			0.199

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

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.205	3.9
BLOCK.WP.SP	50	0.282	5.3

GRAIN MEAN DM% 79.0

SUB PLOT AREA HARVESTED 0.00163