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77/R/B/4 Nitrification Inhibitors and Foliar Diseases - Barley

Rothamsted Research

Rothamsted Research (1978) *77/R/B/4 Nitrification Inhibitors and Foliar Diseases - Barley* ; Yields Of The Field Experiments 1977, pp 350 - 353 - DOI: <https://doi.org/10.23637/ERADOC-1-29>

77/R/B/4

SPRING BARLEY

NITRIFICATION INHIBITORS 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 - Long Hoos I/II.

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

Design: 2 randomised blocks of 6 plots split into 4.

Whole plot dimensions: 4.27 x 39.3.

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 sodium trithiocarbonate
added as a nitrification inhibitor |
| SOLID 0 | Solid fertiliser ('Nitro-Chalk', 25% N) applied to seedbed,
no nitrification inhibitor |

Sub plots

- | | |
|-------------|---|
| 3. MILDEW F | Mildew fungicide: |
| NONE | None |
| TRIDEMOR | Tridemorph on 20 June, 1977 and 13 July |
| 4. RUST F | Rust fungicide: |
| NONE | None |
| BENODANI | Benodanil on 11 July |

- NOTES: (1) Fungicides were applied in 340 l:-
(a) Tridemorph at 0.53 kg
(b) Benodanil at 1.12 kg with 175 ml 'Citowett' as a wetter.
(2) Sides of plots were separated by a 2 m strip of Mazurka.
(3) Liquid nitrogen was applied by injectors with tines 30 cm apart
10 cm deep.
(4) Sodium trithiocarbonate was applied at 28 kg.
(5) Nitrogen fertiliser was applied on 4 Apr.

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).

Seed: Zephyr, sown at 160 kg.

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Cultivations, etc.:- Ploughed: 30 Sept, 1976. Spring-tine cultivated: 31 Mar, 1977. Power harrowed, seed sown: 5 Apr. Weedkillers applied: 26 May. Combine harvested: 27 Aug. Previous crops: Potatoes 1975, wheat 1976.

NOTE: Plant emergence counts were made. Mildew and brown rust were assessed during the season. Counts of ears and numbers of grains per ear were made. The crop was sampled for nitrogen determinations.

GRAIN TONNES/HECTARE

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

N FORM N RATE	LIQUID 0	LIQUID I	SOLID 0	MEAN
70	5.49	5.53	5.27	5.43
110	5.53	5.52	5.49	5.51
MEAN	5.51	5.52	5.38	5.47
MILDEW F N RATE	NONE	TRIDEMOR	MEAN	
70	5.33	5.53	5.43	
110	5.34	5.68	5.51	
MEAN	5.34	5.61	5.47	
MILDEW F N FORM	NONE	TRIDEMOR	MEAN	
LIQUID 0	5.36	5.65	5.51	
LIQUID I	5.33	5.72	5.52	
SOLID 0	5.32	5.45	5.38	
MEAN	5.34	5.61	5.47	
RUST F N RATE	NONE	BENODANI	MEAN	
70	5.38	5.48	5.43	
110	5.52	5.51	5.51	
MEAN	5.45	5.50	5.47	
RUST F N FORM	NONE	BENODANI	MEAN	
LIQUID 0	5.50	5.52	5.51	
LIQUID I	5.49	5.55	5.52	
SOLID 0	5.35	5.42	5.38	
MEAN	5.45	5.50	5.47	

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GRAIN TONNES/HECTARE

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

RUST F	NONE	BENODANI	MEAN
MILDEW F			
NONE	5.34	5.33	5.34
TRIDEMOR	5.55	5.66	5.61
MEAN	5.45	5.50	5.47

N FORM	LIQUID 0		LIQUID I		SOLID 0	
	NONE	TRIDEMOR	NONE	TRIDEMOR	NONE	TRIDEMOR
MILDEW F						
N RATE						
70	5.43	5.55	5.32	5.74	5.23	5.31
110	5.29	5.76	5.34	5.69	5.40	5.59

N FORM	LIQUID 0		LIQUID I		SOLID 0	
	NONE	BENODANI	NONE	BENODANI	NONE	BENODANI
RUST F						
N RATE						
70	5.46	5.51	5.47	5.58	5.19	5.36
110	5.53	5.52	5.51	5.52	5.50	5.48

MILDEW F	TRIDEMOR	
	NONE	BENODANI
RUST F		
N RATE		
70	5.30	5.35
110	5.38	5.31

MILDEW F	TRIDEMOR	
	NONE	BENODANI
RUST F		
N FORM		
LIQUID 0	5.43	5.30
LIQUID I	5.32	5.33
SOLID 0	5.27	5.37

MILDEW F	TRIDEMOR	
	NONE	BENODANI
RUST F		
N RATE		
70 LIQUID 0	5.48	5.37
LIQUID I	5.29	5.35
SOLID 0	5.14	5.32
110 LIQUID 0	5.37	5.22
LIQUID I	5.36	5.31
SOLID 0	5.39	5.41

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GRAIN TONNES/HECTARE

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

TABLE	N RATE	N FORM	MILDEW F	RUST F
SED	0.031	0.038	0.038	0.038

TABLE	N RATE N FORM	N RATE MILDEW F	N FORM MILDEW F	N RATE RUST F
SED	0.053	0.049	0.060	0.049

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

N RATE		0.054		0.054
N FORM			0.066	

TABLE	N FORM RUST F	MILDEW F RUST F	N RATE N FORM MILDEW F	N RATE N FORM RUST F
SED	0.060	0.054	0.085	0.085

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

N FORM	0.066			
N RATE.N FORM			0.094	0.094

TABLE	N RATE MILDEW F RUST F	N FORM MILDEW F RUST F	N RATE N FORM MILDEW F RUST F
SED	0.073	0.090	0.127

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

N RATE	0.077		
N FORM		0.094	
N RATE.N FORM			0.133

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

STRATUM	DF	SE	CV%
BLOCK.WP	5	0.053	1.0
BLOCK.WP.SP	18	0.133	2.4

GRAIN MEAN DM% 75.4

PLOT AREA HARVESTED 0.00195