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90/R/WW/3 N and Crop Physiology - W. Wheat

Rothamsted Research

Rothamsted Research (1991) *90/R/WW/3 N and Crop Physiology - W. Wheat* ; Yields Of The Field Experiments 1990, pp 111 - 113 - DOI: <https://doi.org/10.23637/ERADOC-1-42>

90/R/WW/3

WINTER WHEAT

N AND CROP PHYSIOLOGY

Object: To study the relationship between N supply to crops of different size and their nitrate contents, N uptakes, growth rates and yield - Little Knott I.

Sponsors: G.F.J. Milford, R.J. Darby.

Design: 3 randomised blocks of 15 plots.

Whole plot dimensions: 3.0 x 14.0.

Treatments: All combinations of:-

1. **SOW DATE** Dates of sowing:

 6 SEP 6 September, 1989
 9 OCT 9 October
 15 NOV 15 November

2. **N R T S** Nitrogen fertilizer (kg N) as 'Nitro-Chalk' (27% N),
 rates, times and plot shading:

 NONE None
 115 E 40 kg N on 16 Mar, 1990 + 75 kg N on 9 Apr
 230 E 80 " " " " " " " + 150 " " " " " (duplicated)
 230 L " " " " 9 Apr " " " " " 26 Apr

- NOTES:**
- (1) Shading, to reduce light to 44% of normal, was erected on 28 Mar, 1990 for the first two sowing dates, on 20 Apr for the third on sampled areas only of one of the duplicates of **N R T S** 230 E.
 - (2) Deltamethrin at 6.2 g in 220 l was applied to **SOW DATE** 6 SEP on 10 Oct, 1989.
 - (3) Deltamethrin at 6.2 g with chlorotoluron at 3.5 kg in 300 l was applied to **SOW DATE** 6 SEP and **SOW DATE** 9 OCT on 9 Nov, 1989.
 - (4) Chlorotoluron at 3.5 kg in 300 l was applied to **SOW DATE** 15 NOV on 15 Nov, 1989.
 - (5) Each sowing date was rotary harrowed before drilling.
 - (6) Irrigation was applied to the whole site, 12 mm on each occasion, on 25 Sept and 27 Sept.

Basal applications: Weedkillers: Glyphosate at 1.4 kg in 200 l. Fluroxypyr at 0.20 kg with bromoxynil at 0.19 kg, ioxynil at 0.19 kg and diclofop-methyl at 1.1 kg in 300 l. Fungicides: Chlorothalonil at 0.75 kg with fenpropimorph at 0.75 kg in 300 l. Tridemorph at 0.52 kg with pirimicarb in 300 l. Insecticides: Pirimicarb at 0.14 kg. Omethoate at 0.64 kg in 300 l.

Seed: Mercia, dressed triadimenol and fuberidazole, sown at 180 kg.

90/R/WW/3

Cultivations, etc.:- Glyphosate applied: 5 Aug, 1989. Deep-tine cultivated with vibrating tines: 22 Aug. Ploughed: 24 Aug. Rotary harrowed, spike rotary cultivated twice: 5 Sept. Omethoate applied: 23 Feb, 1990. Remaining weedkillers applied: 27 Mar. Chlorothalonil with fenpropimorph applied: 25 May. Tridemorph with pirimicarb applied: 26 June. Combine harvested: 11 Aug. Previous crops: W. wheat 1988, w. oats 1989.

NOTE: Soils were sampled, to 90 cm depth, for ammonium and nitrate contents on four occasions from mid-October to the end of February. Crop samples were taken from November to June at fortnightly intervals to measure stem nitrate concentrations and at similar intervals from April to the end of June to measure crop growth and total N contents.

GRAIN TONNES/HECTARE

***** Tables of means *****

N R T S	NONE	115 E	230 E	230 L	Mean
SOW DATE					
6 SEPT	4.36	8.22	9.18	8.43	7.55
9 OCT	5.19	8.25	9.51	8.42	7.84
15 NOV	4.61	7.62	8.81	7.69	7.18
Mean	4.72	8.03	9.17	8.18	7.52

*** Standard errors of differences of means ***

SOW DATE	N R T S	SOW DATE	N R T S
	0.261	0.451	min.rep
0.202	0.226	0.391	max-min
		0.319	max.rep

N R T S
 max.rep 230 E only
 min.rep any of the remainder
 max-min 230 E v any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	31	0.553	7.0
GRAIN MEAN DM%	89.6		

90/R/WW/3

STRAW TONNES/HECTARE

***** Tables of means *****

N R T S	NONE	115 E	230 E	230 L	Mean
SOW DATE					
6 SEPT	1.71	4.05	4.07	3.03	3.22
9 OCT	1.96	3.35	4.54	2.72	3.14
15 NOV	1.52	3.47	3.58	2.59	2.79
Mean	1.73	3.62	4.06	2.78	3.05

STRAW MEAN DM% 86.6

PLOT AREA HARVESTED 0.00172