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

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89/R/WW/3

WINTER WHEAT

N AND CROP PHYSIOLOGY

Object: To study, in crops given optimal or less than optimal N, the dynamics of late N within the plant, the effects on flag leaf photosynthesis and protein retention and the N status of individual organs - Little Knott I.

Sponsors: G.F.J. Milford, D.W. Lawlor, P.B. Barraclough.

Associate sponsor: D.S. Powlson.

Design: 3 randomised blocks of 9 plots.

Whole plot dimensions: 3.0 x 9.0.

Treatments: All combinations of:-

1. **EARLY N** Nitrogen fertilizer (kg N) applied as 'Nitro-Chalk' divided in a 1:2:1 ratio between 30 Mar, 1989, 14 Apr and 5 May respectively:

0
80
200

2. **LATE N** Nitrogen fertilizer applied late:

0 None
NLEAF To foliage, 40 kg N as urea in 225 l in two equal applications on 25 May, 1989 and 26 May
NSOIL To soil, 40 kg N as prilled urea on 25 May

plus two extra treatments given EARLY N 200 and magnesium at 2.5 kg on 23 June and on 7 July:

EARLYNMG

NONE None
UREA 40 kg N as urea in 225 l in two equal applications on 23 June, 1989, and 24 June

Basal applications: Manures: (0:18:36) at 280 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Paraquat at 0.60 kg ion in 200 l. Metsulfuron-methyl at 6.0 g with the prochloraz in 220 l. Fungicides: Prochloraz at 0.40 kg. Propiconazole at 0.12 kg with chlorothalonil at 1.0 kg in 220 l. Insecticide: Fonofos at 1.4 kg in 200 l.

Seed: Avalon, sown at 170 kg.

89/R/WW/3

Cultivations, etc.:- Rotary cultivated: 17 Sept, 1988. Glyphosate applied: 17 Oct. Paraquat applied: 24 Oct. Heavy spring-tine cultivated: 26 Oct. PK applied: 28 Oct. Ploughed: 29 Oct. Rotary harrowed: 1 Nov. Rotary harrowed, seed sown: 3 Nov. Fonofos applied: 26 Jan, 1989. Metsulfuron-methyl with prochloraz applied: 3 May. Propiconazole with chlorothalonil applied: 15 June. Combine harvested: 3 Aug. Previous crops: S. beans 1987, w. oats 1988.

NOTE: Samples were taken for measurements of crop and grain growth and N content, weekly from April until maturity.

GRAIN TONNES/HECTARE

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

LATE N	0	NLEAF	NSOIL	Mean
EARLY N				
0	3.19	3.55	3.95	3.56
80	5.95	5.69	5.61	5.75
200	6.94	6.73	6.49	6.72
Mean	5.36	5.32	5.35	5.34

EARLYNMG	NONE	UREA	Mean
	6.68	6.63	6.66

GRAND MEAN 5.58

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

EARLY N	LATE N	EARLY N LATE N & EARLYNMG
0.287	0.287	0.497

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	20	0.608	10.9

GRAIN MEAN DM% 85.0

PLOT AREA HARVESTED 0.00207