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

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92/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 - Fosters West.

Sponsor: R.J. Darby.

Design: 3 randomised blocks of 16 plots.

Whole plot dimensions: 3.0 x 17.0.

Treatments: All combinations of:-

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

 EARLY Second week in September
 LATE Third week in October

2. **AUT N** Autumn nitrogen:

 NONE None
 50 50 kg N

3. **SPRING N** Spring nitrogen:

 NONE None
 N1 Half optimum N
 N2 Optimum N
 N2L Optimum N three weeks later

Experimental diary:

- 06-Sep-91 : B : Ploughed and furrow pressed.
- 12-Sep-91 : B : Rotary harrowed.
- 12-Sep-91 : T : **SOW DATE EARLY**: Rotary harrowed, Mercia, drilled at 160 kg. Rolled.
- 14-Oct-91 : T : **SOW DATE LATE**: Rotary harrowed, Mercia, drilled at 160 kg.
- 15-Oct-91 : B : Rolled.
- 29-Oct-91 : T : **AUT N 50**: 46% N (as urea) at 109 kg.
- 27-Nov-91 : B : Stefes IPU at 2.5 l and Stomp 400 at 3.3 l in 300 l.
- 16-Mar-92 : T : **SPRING N N1**: 27% N at 111 kg.
 N2: 27% N at 222 kg.
- 09-Apr-92 : T : **SPRING N N1**: 27% N at 304 kg.
 N2: 27% N at 607 kg.
 N2L: 27% N at 222 kg.
- 29-Apr-92 : T : **SPRING N N2L**: 27% N at 607 kg.
- 19-May-92 : B : Dorin at 1.0 l and Chiltern Olé at 1.5 l in 300 l.
- 22-Jun-92 : B : Mistral at 0.50 l and Radar at 0.50 l in 300 l.
- 04-Aug-92 : B : Combine harvested.

Previous crops: Potatoes 1990, s. wheat 1991.

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NOTE: Soils were sampled to 90 cm depth for ammonium and nitrate contents on three occasions between mid-October and late February. Stem nitrate concentrations were measured at fortnightly intervals from November to April. Lodging was assessed in June and July. Components of yield were measured after hand harvesting in late July.

GRAIN TONNES/HECTARE

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

AUT N	NONE	50	Mean			
SOW DATE						
EARLY	7.24	7.35	7.29			
LATE	6.96	6.47	6.72			
Mean	7.10	6.91	7.01			
SPRING N	NONE	N1	N2	N2L	Mean	
SOW DATE						
EARLY	6.07	7.79	6.99	8.31	7.29	
LATE	5.54	7.44	6.40	7.51	6.72	
Mean	5.80	7.62	6.69	7.91	7.01	
SPRING N	NONE	N1	N2	N2L	Mean	
AUT N						
NONE	5.10	7.76	7.22	8.32	7.10	
50	6.51	7.47	6.17	7.49	6.91	
Mean	5.80	7.62	6.69	7.91	7.01	
SOW DATE	AUT N	SPRING N	NONE	N1	N2	N2L
EARLY	NONE		5.12	7.77	7.56	8.50
	50		7.03	7.82	6.42	8.12
LATE	NONE		5.08	7.76	6.88	8.14
	50		6.00	7.11	5.92	6.87

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

SOW DATE	AUT N	SPRING N	SOW DATE
			AUT N
0.095	0.095	0.134	0.134
SOW DATE	AUT N	SOW DATE	
SPRING N	SPRING N	AUT N	SPRING N
0.189	0.189	0.268	

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.328	4.7

GRAIN MEAN DM% 86.1

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STRAW TONNES/HECTARE

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

AUT N	NONE	50	Mean			
SOW DATE						
EARLY	6.91	8.40	7.66			
LATE	6.66	7.46	7.06			
Mean	6.78	7.93	7.36			
SPRING N	NONE	N1	N2	N2L	Mean	
SOW DATE						
EARLY	5.70	8.28	8.78	7.87	7.66	
LATE	4.70	7.64	7.97	7.93	7.06	
Mean	5.20	7.96	8.37	7.90	7.36	
SPRING N	NONE	N1	N2	N2L	Mean	
AUT N						
NONE	3.88	7.58	8.39	7.28	6.78	
50	6.51	8.35	8.35	8.52	7.93	
Mean	5.20	7.96	8.37	7.90	7.36	
SOW DATE	AUT N	SPRING N	NONE	N1	N2	N2L
EARLY	NONE		3.95	7.66	8.69	7.34
	50		7.44	8.91	8.87	8.40
LATE	NONE		3.81	7.50	8.10	7.23
	50		5.58	7.78	7.84	8.64

STRAW MEAN DM% 81.9

PLOT AREA HARVESTED 0.00322