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80/W/WW/3 Winter Wheat Growth and Yield on a Contrasted Site

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80/W/WW/3

WINTER WHEAT

GROWTH AND YIELD ON A CONTRASTED SITE

Object: To study on a contrasted site the effects of some of the factors tested in 80/R/WW/3 Factors Limiting Yield and to determine the extent to which differences between the sites can be eliminated by appropriate combinations of the factors - Woburn Broad Mead I.

Sponsors: P.J. Welbank, F.V. Widdowson.

Design: Half replicate of 2^6 + 12 extra plots.

Whole plot dimensions: 3.25 x 15.24.

Treatments: Combinations of:-

- | | |
|-------------|--|
| 1. SOWDATE | Dates of sowing: |
| 12 OCT | 12 October, 1979 |
| 30 OCT | 30 October |
| 2. TOTAL N | Total amounts of nitrogen fertiliser (kg N) applied: |
| 90 | |
| 150 | |
| 3. N DIVIS | Division of total nitrogen fertiliser: |
| SINGLE | Single dressing |
| DIVIDED | 40 kg of the total before single dressing, 25 kg of the total after single dressing, remainder on single dressing date |
| 4. N TIME | Time of applying single dressing of nitrogen fertiliser |
| EARLY | At ear initiation of SOWDATE 12 OCT |
| LATE | At ear initiation of SOWDATE 30 OCT |
| 5. AUT PEST | Autumn pesticide: |
| NONE | None |
| ALDICARB | Aldicarb at 5 kg worked in to seedbed |
| 6. IRRIGATN | Irrigation: |
| NONE | None |
| FULL | Full (164 mm) to lessen a deficit of 25 mm to 12.5 mm |

plus all combinations of the following (all given N as a single dressing at ear initiation of late sown crop, aldicarb to seedbed but not irrigation):

- | | |
|-------------|------------------|
| 1. SOWDATEX | Dates of sowing: |
| 12 OCT | |
| 30 OCT | |

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2. TOTAL NX Total amount of nitrogen fertiliser (kg N):

0
45
90
120
150
180

Irrigation was applied as follows (mm water):

16 May	25
18 May	12.5
19 May	12.5
21 May	12.5
22 May	12.5
28 May	25
29 May	15
3 June	15
13 June	16
23 June	8
25 July	10
Total	164

NOTE: Nitrogen applications were as follows:

	N DIVIS	
	SINGLE	DIVIDED
SOWDATE 12 OCT	5 Mar	31 Jan, 5 Mar, 8 May
SOWDATE 30 OCT	16 Apr	5 Mar, 16 Apr, 21 May

Standard applications: Manures: (0:20:20) at 310 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 340 l to SE plots and in 280 l to SL plots). Isoproturon at 2.1 l in 280 l. Growth regulator: Chlormequat at 1.4 l in 280 l. Fungicides: Carbendazim, tridemorph and maneb ('Cosmic' at 4 kg in 250 l) applied three times, with captafol at 0.95 kg on the first occasion, with insecticide on the second and third occasion. Insecticide: Pirimicarb at 0.14 kg.

Seed: Hustler, sown at 160 kg.

Cultivations, etc.: Heavy spring-tine cultivated twice: 6 Oct, 1979. PK applied, aldicarb applied for SOW DATE 12 OCT and all plots rotary cultivated: 8 Oct. Spring-tine cultivated all plots: 12 Oct. Aldicarb applied for SOW DATE 30 OCT. Spring-tine cultivated with crumbler attached these plots only: 29 Oct. 'Brittox' applied to SOW DATE 12 OCT: 20 Feb, 1980. Isoproturon applied to all plots: 11 Apr. 'Brittox' applied to SOW DATE 30 OCT, growth regulator applied to SOW DATE 12 OCT: 24 Apr. 'Cosmic' and captafol applied: 9 May. Growth regulator applied to SOW DATE 30 OCT: 13 May. 'Cosmic' and insecticide applied: 19 June, 10 July. Combine harvested: 26 Aug. Previous crops: W. oats 1978, potatoes 1979.

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NOTE: Measurements were made of plant and shoot numbers, dry weight of tops and ears, leaf areas and N, P and K content three times during growing season. Weekly measurements were made for soil moisture and plant moisture stress (between April and harvest). Disease assessments were made during the growing season. Soil samples were taken in autumn and spring before fertiliser application to determine their N content.

GRAIN TONNES/HECTARE

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

TOTAL N	90	150	MEAN
SOWDATE			
12 OCT	8.64	9.02	8.83
30 OCT	8.06	8.37	8.22
MEAN	8.35	8.70	8.52
N DIVIS	SINGLE	DIVIDED	MEAN
SOWDATE			
12 OCT	9.08	8.58	8.83
30 OCT	8.29	8.14	8.22
MEAN	8.68	8.36	8.52
N DIVIS	SINGLE	DIVIDED	MEAN
TOTAL N			
90	8.57	8.13	8.35
150	8.80	8.60	8.70
MEAN	8.68	8.36	8.52
N TIME	EARLY	LATE	MEAN
SOWDATE			
12 OCT	8.57	9.09	8.83
30 OCT	8.12	8.31	8.22
MEAN	8.35	8.70	8.52
N TIME	EARLY	LATE	MEAN
TOTAL N			
90	8.12	8.57	8.35
150	8.57	8.83	8.70
MEAN	8.35	8.70	8.52
N TIME	EARLY	LATE	MEAN
N DIVIS			
SINGLE	8.49	8.88	8.68
DIVIDED	8.21	8.52	8.36
MEAN	8.35	8.70	8.52

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GRAIN TONNES/HECTARE

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

AUT PEST	NONE	ALDICARB	MEAN
SOWDATE			
12 OCT	8.76	8.90	8.83
30 OCT	8.31	8.12	8.22
MEAN	8.54	8.51	8.52

AUT PEST	NONE	ALDICARB	MEAN
TOTAL N			
90	8.38	8.32	8.35
150	8.69	8.70	8.70
MEAN	8.54	8.51	8.52

AUT PEST	NONE	ALDICARB	MEAN
N DIVIS			
SINGLE	8.58	8.79	8.68
DIVIDED	8.49	8.23	8.36
MEAN	8.54	8.51	8.52

AUT PEST	NONE	ALDICARB	MEAN
N TIME			
EARLY	8.27	8.42	8.35
LATE	8.80	8.59	8.70
MEAN	8.54	8.51	8.52

IRRIGATN	NONE	FULL	MEAN
SOWDATE			
12 OCT	8.90	8.76	8.83
30 OCT	8.15	8.28	8.22
MEAN	8.53	8.52	8.52

IRRIGATN	NONE	FULL	MEAN
TOTAL N			
90	8.29	8.40	8.35
150	8.76	8.64	8.70
MEAN	8.53	8.52	8.52

IRRIGATN	NONE	FULL	MEAN
N DIVIS			
SINGLE	8.76	8.61	8.68
DIVIDED	8.30	8.43	8.36
MEAN	8.53	8.52	8.52

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GRAIN TONNES/HECTARE

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

IRRIGATN	NONE	FULL	MEAN				
N TIME							
EARLY	8.29	8.40	8.35				
LATE	8.76	8.64	8.70				
MEAN	8.53	8.52	8.52				
IRRIGATN	NONE	FULL	MEAN				
AUT PEST							
NONE	8.43	8.64	8.54				
ALDICARB	8.62	8.40	8.51				
MEAN	8.53	8.52	8.52				
TOTAL NX	0	45	90	120	150	180	MEAN
SOWDATEX							
12 OCT	5.99	8.10	7.77	8.88	9.28	8.86	8.15
30 OCT	6.54	6.90	7.43	7.36	8.34	8.53	7.51
MEAN	6.26	7.50	7.60	8.12	8.81	8.69	7.83

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

SED FOR ALL TABLES EXCEPT TOTAL NX.SOWDATEX

ONE FACTOR TABLES 0.102

TWO FACTOR TABLES 0.145

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

STRATUM	DF	SE	CV%
WP	10	0.289	3.4

GRAIN MEAN DM% 84.2

PLOT AREA HARVESTED 0.00139