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79/W/WW/3 Growth and Yield on a Contrasted Site - W. Wheat

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79/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 79/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 Butt Close III.

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

Design: Half replicate of 2^6 , arranged as 16 whole plots split into 2, plus 2 extra plots split into 2.

Whole plot dimensions: 3.25 x 30.5.

Treatments: Combinations of:-

Whole plots

- | | |
|-------------|--|
| 1. DRILLS | Drills, sowing seed at 380 seeds per m^2 in rows 10 cm (4 in) apart: |
| NORDSTEN | Nordsten drill spacing seed irregularly within the row |
| STANHAY | Stanhay precision drill |
| 2. SOWDATE | Dates of sowing: |
| 22 SEPT | 22 September, 1978 |
| 12 OCT | 12 October |
| 3. AUT PEST | Autumn pesticide: |
| NONE | None |
| ALDICARB | Aldicarb at 5 kg worked in to seedbed |

Sub plots

- | | |
|-------------|---|
| 4. TOTAL N | Total amount of nitrogen fertiliser: |
| 205 | |
| 295 | |
| 5. N TIME | Times of applying nitrogen fertiliser: |
| A | All applied on 5 Apr, 1979 |
| M A M | 40 kg of total applied on 12 Mar, 45 kg applied on 18 May, remainder on 5 Apr |
| 6. IRRIGATN | Irrigation: |
| NONE | None |
| FULL | Full (120 mm) to lessen a deficit of 30 mm to 12 mm |

plus two extra plots split into two, both whole plots identical and sown by Stanhay drill on 22 September, all N applied on 5 Apr, given aldicarb and full irrigation, testing rates of nitrogen fertiliser (kg N):

79/W/WW/3

EXTRA
N 0
N 160
N 250
N 340

Irrigation was applied as follows (mm water):

22 June	10
28 June	10
2 July	10
5 July	10
9 July	10
12 July	10
16 July	10
19 July	10
23 July	10
26 July	10
30 July	10
6 Aug	10
Total	120

Standard applications: Manures: (0:14:28) at 350 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 kg on two occasions, on the first in 120 l and the second in 300 l). Growth regulator: Chlormequat at 1.4 kg in 340 l. Fungicide: Carbendazim, tridemorph and maneb ('Cosmic' at 4.0 kg in 340 l) on two occasions. Aphicide: Pirimicarb at 0.14 kg in 340 l.

Seed: Hustler, sown at 174 kg.

Cultivations, etc.: - Heavy spring-tine cultivated, PK applied: 13 Sept, 1978. Aldicarb applied for SOW DATE 22 SEPT and all these plots rotary cultivated: 21 Sept. Aldicarb applied for SOW DATE 12 OCT and all these plots rotary cultivated: 12 Oct. Weedkillers applied: 28 Dec. First N applied: 12 Mar, 1979. Second N applied: 5 Apr. Growth regulator applied to early sowing: 18 Apr. Weedkillers applied: 2 May. Growth regulator applied to late sowing: 8 May. Third N applied: 18 May. Fungicide applied twice: 24 May, 19 June. Aphicide applied: 26 June. Combine harvested: 31 Aug. Previous crops: Beans 1977, early potatoes 1978.

NOTE: Measurements were made of plant and shoot numbers, dry weight of tops and ears, leaf areas and nitrate and potassium content four times during the growing season. Weekly measurements were made for soil moisture and plant moisture stress (between April and August). Disease assessments were made during the growing season. Soil samples were taken in February and April to determine their N content.

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GRAIN TONNES/HECTARE

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

SOWDATE	22 SEPT	12 OCT	MEAN
DRILLS			
NORDSTEN	7.88	7.66	7.77
STANHAY	8.13	7.38	7.75
MEAN	8.00	7.52	7.76
AUT PEST	NONE	ALDICARB	MEAN
DRILLS			
NORDSTEN	7.40	8.14	7.77
STANHAY	7.46	8.05	7.75
MEAN	7.43	8.10	7.76
AUT PEST	NONE	ALDICARB	MEAN
SOWDATE			
22 SEPT	7.48	8.53	8.00
12 OCT	7.38	7.66	7.52
MEAN	7.43	8.10	7.76
TOTAL N	205	295	MEAN
DRILLS			
NORDSTEN	7.76	7.78	7.77
STANHAY	7.75	7.76	7.75
MEAN	7.76	7.77	7.76
TOTAL N	205	295	MEAN
SOWDATE			
22 SEPT	7.91	8.09	8.00
12 OCT	7.60	7.45	7.52
MEAN	7.76	7.77	7.76
TOTAL N	205	295	MEAN
AUT PEST			
NONE	7.43	7.42	7.43
ALDICARB	8.08	8.11	8.10
MEAN	7.76	7.77	7.76
N TIME	A	M A M	MEAN
DRILLS			
NORDSTEN	7.70	7.84	7.77
STANHAY	7.58	7.93	7.75
MEAN	7.64	7.89	7.76
N TIME	A	M A M	MEAN
SOWDATE			
22 SEPT	7.95	8.06	8.00
12 OCT	7.33	7.71	7.52
MEAN	7.64	7.89	7.76

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GRAIN TONNES/HECTARE

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

N TIME	A	M A M	MEAN		
AUT PEST					
NONE	7.35	7.51	7.43		
ALDICARB	7.93	8.26	8.10		
MEAN	7.64	7.89	7.76		
N TIME	A	M A M	MEAN		
TOTAL N					
205	7.70	7.81	7.76		
295	7.57	7.96	7.77		
MEAN	7.64	7.89	7.76		
IRRIGATN	NONE	FULL	MEAN		
DRILLS					
NORDSTEN	7.21	8.33	7.77		
STANHAY	7.13	8.38	7.75		
MEAN	7.17	8.35	7.76		
IRRIGATN	NONE	FULL	MEAN		
SOWDATE					
22 SEPT	7.28	8.72	8.00		
12 OCT	7.06	7.99	7.52		
MEAN	7.17	8.35	7.76		
IRRIGATN	NONE	FULL	MEAN		
AUT PEST					
NONE	6.84	8.01	7.43		
ALDICARB	7.50	8.69	8.10		
MEAN	7.17	8.35	7.76		
IRRIGATN	NONE	FULL	MEAN		
TOTAL N					
205	7.16	8.35	7.76		
295	7.18	8.35	7.77		
MEAN	7.17	8.35	7.76		
IRRIGATN	NONE	FULL	MEAN		
N TIME					
A	6.99	8.29	7.64		
M A M	7.35	8.42	7.89		
MEAN	7.17	8.35	7.76		
EXTRA	N 0	N 160	N 250	N 340	MEAN
	3.87	7.95	9.12	8.14	7.27

GRAND MEAN 7.71

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GRAIN TONNES/HECTARE

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

TABLE	EXTRA	DRILLS	SOWDATE	AUT PEST
SED	0.786	0.183	0.185	0.186
TABLE	TOTAL N	N TIME	IRRIGATN	DRILLS SOWDATE
SED	0.210	0.201	0.185	0.258
TABLE	DRILLS AUT PEST	SOWDATE AUT PEST	DRILLS TOTAL N	SOWDATE TOTAL N
SED	0.260	0.264	0.298	0.285
TABLE	AUT PEST TOTAL N	DRILLS N TIME	SOWDATE N TIME	AUT PEST N TIME
SED	0.291	0.272	0.281	0.294
TABLE	TOTAL N N TIME	DRILLS IRRIGATN	SOWDATE IRRIGATN	AUT PEST IRRIGATN
SED	0.301	0.258	0.261	0.260
TABLE	TOTAL N IRRIGATN	N TIME IRRIGATN		
SED	0.288	0.285		

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

STRATUM	DF	SE	CV%
WP	8	0.496	6.4

MEAN DM% 86.8

SUB PLOT AREA HARVESTED 0.00125