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# Yields of the Field Experiments 1981

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## 81/R/B/1 Factors Limiting Yield - W. Barley

### Rothamsted Research

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WINTER BARLEY

FACTORS LIMITING YIELD

Object: To study the effects of a range of factors on the incidence of pests and diseases and on the growth and yield of w. barley - Fosters West.

Sponsors: F.V. Widdowson, J.F. Jenkyn, R.T. Plumb, D.W. Lawlor, G.J.S. Ross.

Associate sponsors: B.R. Kerry, G.C. Scott.

Design: Half replicate of  $2^7$  + 2 extra plots, arranged in 2 blocks.

Whole plot dimensions: 3.0 x 15.2.

Treatments: Combinations of:-

1. SOWDATE            Dates of sowing:  
    17 SEP            17 September, 1980  
    30 OCT            30 October
2. N RATE            Rates of nitrogen fertiliser (kg N):  
    90  
    140
3. N TIME            Times of applying nitrogen fertiliser:  
    EARLY            At end of tillering of SOWDATE 17 SEP - 18 Mar, 81  
    LATE             At end of tillering of SOWDATE 30 OCT - 13 Apr
4. AUT PEST         Autumn pesticide:  
    NONE             None  
    ALDICARB         Aldicarb at 5 kg worked in to seedbed
5. E FUNG            Early fungicides:  
    NONE             None  
    TFSD             Triadimenol and fuberidazole seed dressing
6. L FUNG            Late fungicides:  
    NONE             None  
    PRS              Prochloraz spray at 0.4 l on 16 Feb, 14 May,  
                         and (to SOWDATE 30 Oct only) June
7. GRTH REG         Growth regulator:  
    NONE             None  
    MEP+ETH         Mepiquat chloride + ethephon as 'Terpal' at  
                         2.46 l in 280 l

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plus two extra treatments given no nitrogen fertiliser, pesticides, fungicides or growth regulator:

EXTRA  
 17 SEP 0            Sown 17 September  
 30 OCT 0            Sown 30 October

- NOTE: (1) Aldicarb was applied just before sowing on each occasion, and worked in by the rotary harrow, seed drill combination.  
 (2) The growth regulator was applied at the recommended growth stage (Zadoks 31/32) which occurred on 15 April for the first sowing, and 7 May for the second.  
 (3) The first and third prochloraz sprays were applied in 450 l and the second in 340 l.

Basal applications: Manures: (0:14:28) at 360 kg. Weedkiller: Chlortoluron at 5.6 l in 250 l.

Seed: Igri, sown at 160 kg.

Cultivations: PK applied, heavy spring-tine cultivated twice: 17 Sept, 1980. Weedkiller applied: 1 Nov. Combine harvested: 3 Aug, 1981. Previous crops: S. beans 1979, potatoes 1980.

- NOTES: (1) Nitrate in the crop was measured three times during the season, and nitrate in the soil twice. Crop height and ear numbers were measured in June. Leaf diseases were assessed periodically.  
 (2) The first sowing suffered severe sparrow damage at grain filling and reported grain yields are not reliable estimates of treatment effects.

GRAIN TONNES/HECTARE

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

N RATE	90	140	MEAN
SOWDATE			
17 SEP	7.05	7.22	7.14
30 OCT	7.56	7.38	7.47
MEAN	7.30	7.30	7.30

N TIME	EARLY	LATE	MEAN
SOWDATE			
17 SEP	6.90	7.37	7.14
30 OCT	7.34	7.60	7.47
MEAN	7.12	7.49	7.30

N TIME	EARLY	LATE	MEAN
N RATE			
90	7.19	7.42	7.30
140	7.05	7.55	7.30
MEAN	7.12	7.49	7.30

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GRAIN TONNES/HECTARE

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

AUT PEST	NONE	ALDICARB	MEAN
SOWDATE			
17 SEP	6.87	7.40	7.14
30 OCT	7.39	7.55	7.47
MEAN	7.13	7.47	7.30
AUT PEST	NONE	ALDICARB	MEAN
N RATE			
90	7.07	7.54	7.30
140	7.20	7.41	7.30
MEAN	7.13	7.47	7.30
AUT PEST	NONE	ALDICARB	MEAN
N TIME			
EARLY	6.92	7.32	7.12
LATE	7.35	7.63	7.49
MEAN	7.13	7.47	7.30
E FUNG	NONE	TFSD	MEAN
SOWDATE			
17 SEP	7.57	6.70	7.14
30 OCT	7.54	7.40	7.47
MEAN	7.55	7.05	7.30
E FUNG	NONE	TFSD	MEAN
N RATE			
90	7.61	7.00	7.30
140	7.49	7.11	7.30
MEAN	7.55	7.05	7.30
E FUNG	NONE	TFSD	MEAN
N TIME			
EARLY	7.34	6.90	7.12
LATE	7.77	7.20	7.49
MEAN	7.55	7.05	7.30
E FUNG	NONE	TFSD	MEAN
AUT PEST			
NONE	7.39	6.88	7.13
ALDICARB	7.72	7.23	7.47
MEAN	7.55	7.05	7.30

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GRAIN TONNES/HECTARE

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

L FUNG	NONE	PRS	MEAN
SOWDATE			
17 SEP	6.82	7.45	7.14
30 OCT	7.36	7.58	7.47
MEAN	7.09	7.51	7.30
L FUNG	NONE	PRS	MEAN
N RATE			
90	7.07	7.54	7.30
140	7.11	7.49	7.30
MEAN	7.09	7.51	7.30
L FUNG	NONE	PRS	MEAN
N TIME			
EARLY	6.86	7.37	7.12
LATE	7.32	7.66	7.49
MEAN	7.09	7.51	7.30
L FUNG	NONE	PRS	MEAN
AUT PEST			
NONE	6.95	7.31	7.13
ALDICARB	7.23	7.72	7.47
MEAN	7.09	7.51	7.30
L FUNG	NONE	PRS	MEAN
E FUNG			
NONE	7.27	7.84	7.55
TFSD	6.92	7.19	7.05
MEAN	7.09	7.51	7.30
GRTH REG	NONE	MEP+ETH	MEAN
SOWDATE			
17 SEP	6.93	7.34	7.14
30 OCT	7.30	7.64	7.47
MEAN	7.12	7.49	7.30
GRTH REG	NONE	MEP+ETH	MEAN
N RATE			
90	7.17	7.44	7.30
140	7.07	7.53	7.30
MEAN	7.12	7.49	7.30



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GRAIN TONNES/HECTARE

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

GRTH REG	NONE	MEP+ETH	MEAN
N TIME			
EARLY	6.97	7.27	7.12
LATE	7.27	7.71	7.49
MEAN	7.12	7.49	7.30
GRTH REG	NONE	MEP+ETH	MEAN
AUT PEST			
NONE	7.00	7.26	7.13
ALDICARB	7.24	7.71	7.47
MEAN	7.12	7.49	7.30
GRTH REG	NONE	MEP+ETH	MEAN
E FUNG			
NONE	7.38	7.73	7.55
TFSD	6.86	7.24	7.05
MEAN	7.12	7.49	7.30
GRTH REG	NONE	MEP+ETH	MEAN
L FUNG			
NONE	6.86	7.32	7.09
PRS	7.37	7.66	7.51
MEAN	7.12	7.49	7.30
EXTRA	17 SEPT 0	30 OCT 0	MEAN
	5.36	5.66	5.51

GRAND MEAN 7.25

\*\*\*\*\* STANDARD ERROR OF DIFFERENCES OF MEANS \*\*\*\*\*

SED FOR ONE WAY TABLES (EXCEPT EXTRA) IS 0.087  
 SED FOR TWO WAY TABLES IS 0.124

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

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.350	4.8
GRAIN MEAN DM%	82.5		

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STRAW TONNES/HECTARE

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

N RATE	90	140	MEAN
SOWDATE			
17 SEP	7.78	7.49	7.64
30 OCT	6.45	6.40	6.43
MEAN	7.12	6.94	7.03
N TIME	EARLY	LATE	MEAN
SOWDATE			
17 SEP	7.78	7.49	7.64
30 OCT	6.55	6.30	6.43
MEAN	7.17	6.90	7.03
N TIME	EARLY	LATE	MEAN
N RATE			
90	7.32	6.92	7.12
140	7.02	6.87	6.94
MEAN	7.17	6.90	7.03
AUT PEST	NONE	ALDICARB	MEAN
SOWDATE			
17 SEP	7.65	7.62	7.64
30 OCT	6.24	6.61	6.43
MEAN	6.95	7.11	7.03
AUT PEST	NONE	ALDICARB	MEAN
N RATE			
90	7.16	7.08	7.12
140	6.74	7.15	6.94
MEAN	6.95	7.11	7.03
AUT PEST	NONE	ALDICARB	MEAN
N TIME			
EARLY	7.00	7.34	7.17
LATE	6.90	6.89	6.90
MEAN	6.95	7.11	7.03
E FUNG	NONE	TFSD	MEAN
SOWDATE			
17 SEP	6.97	8.30	7.64
30 OCT	6.17	6.68	6.43
MEAN	6.57	7.49	7.03

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STRAW TONNES/HECTARE

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

E FUNG	NONE	TFSD	MEAN
N RATE			
90	6.66	7.58	7.12
140	6.48	7.41	6.94
MEAN	6.57	7.49	7.03
E FUNG	NONE	TFSD	MEAN
N TIME			
EARLY	6.68	7.65	7.17
LATE	6.46	7.33	6.90
MEAN	6.57	7.49	7.03
E FUNG	NONE	TFSD	MEAN
AUT PEST			
NONE	6.55	7.34	6.95
ALDICARB	6.59	7.64	7.11
MEAN	6.57	7.49	7.03
L FUNG	NONE	PRS	MEAN
SOWDATE			
17 SEP	7.40	7.88	7.64
30 OCT	6.22	6.63	6.43
MEAN	6.81	7.25	7.03
L FUNG	NONE	PRS	MEAN
N RATE			
90	7.04	7.20	7.12
140	6.58	7.31	6.94
MEAN	6.81	7.25	7.03
L FUNG	NONE	PRS	MEAN
N TIME			
EARLY	6.85	7.48	7.17
LATE	6.77	7.02	6.90
MEAN	6.81	7.25	7.03
L FUNG	NONE	PRS	MEAN
AUT PEST			
NONE	6.77	7.13	6.95
ALDICARB	6.85	7.38	7.11
MEAN	6.81	7.25	7.03



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STRAW TONNES/HECTARE

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

L FUNG	NONE	PRS	MEAN
E FUNG			
NONE	6.46	6.68	6.57
TFSD	7.16	7.83	7.49
MEAN	6.81	7.25	7.03
GRTH REG	NONE	MEP+ETH	MEAN
SOWDATE			
17 SEP	7.53	7.75	7.64
30 OCT	6.30	6.56	6.43
MEAN	6.91	7.15	7.03
GRTH REG	NONE	MEP+ETH	MEAN
N RATE			
90	6.97	7.26	7.12
140	6.85	7.04	6.94
MEAN	6.91	7.15	7.03
GRTH REG	NONE	MEP+ETH	MEAN
N TIME			
EARLY	7.03	7.31	7.17
LATE	6.80	6.99	6.90
MEAN	6.91	7.15	7.03
GRTH REG	NONE	MEP ETH	MEAN
AUT PEST			
NONE	6.98	6.91	6.95
ALDICARB	6.84	7.39	7.11
MEAN	6.91	7.15	7.03
GRTH REG	NONE	MEP+ETH	MEAN
E FUNG			
NONE	6.50	6.64	6.57
TFSD	7.32	7.67	7.49
MEAN	6.91	7.15	7.03
GRTH REG	NONE	MEP+ETH	MEAN
L FUNG			
NONE	6.68	6.94	6.81
PRS	7.15	7.36	7.25
MEAN	6.91	7.15	7.03

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STRAW TONNES/HECTARE

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

EXTRA	17 SEPT 0	30 OCT 0	MEAN
	5.77	3.64	4.70
GRAND MEAN	6.97		
STRAW MEAN DM%	84.8		
PLOT AREA HARVESTED	0.00450		