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# Yields of the Field Experiments 1982

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## 82/R/B/1 Factors Limiting Yield - Winter Barley

### Rothamsted Research

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82/R/B/1

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 - Pastures.

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

Associate sponsor: B.R. Kerry.

Design: Quarter replicate of  $2^8$  in 2 blocks of 32 plots + 2 extra plots in each block.

Whole plot dimensions: 3.0 x 15.2.

Treatments: Combinations of:-

- |                |  |
|----------------|--|
| 1. SOWDATE     | Dates of sowing:   |
| 22 SEP         | 22 September, 1981   |
| 22 OCT         | 22 October   |
| 2. N RATE      | Rates of nitrogen fertilizer (kg N) as 'Nitro-Chalk':                |
| 50             |  |
| 100            |  |
| 3. N TIME      | Times of applying nitrogen fertilizer:                               |
| 22 MAR         | 22 March, 1982   |
| 19 APR         | 19 April   |
| 4. AUT PEST(1) | Autumn pesticide to seedbed:   |
| NONE           | None   |
| ALDICARB       | Aldicarb at 7.1 kg   |
| 5. AUT PEST(2) | Autumn pesticide to seedlings:                                       |
| NONE           | None   |
| CHLORPYR       | Chlorpyrifos spray at 0.71 kg in 340 l on 13 Nov, 1981               |
| 6. E FUNG      | Early fungicides:  |
| NONE           | None   |
| TFSD           | Triadimenol and fuberidazole seed dressing                           |
| 7. L FUNG      | Late fungicides:   |
| NONE           | None   |
| PROCHLOR       | Prochloraz spray at 0.4 l in 340 l, on 3 Feb, 1982, 26 Mar and 5 May |

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8. GRTH REG            Growth regulator:  
NONE                    None  
MEP+ETH                Mepiquat chloride + ethephon (as 'Terpal' at  
                              2.46 l) in 280 l

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

EXTRA  
22 SEP 0                Sown 22 September  
22 OCT 0                Sown 22 October

NOTE: (1) Aldicarb was applied just before sowing on each occasion, and  
worked in by a rotary harrow, seed drill combination.  
(2) The growth regulator was applied at the recommended growth stage  
(Zadoks 31/32) which occurred on 30 April for the first sowing,  
and 13 May for the second.

Basal applications: Manures: (0:14:28) at 360 kg. Weedkillers:  
Methabenzthiazuron at 1.6 kg in 250 l. Mecoprop, bromoxynil and ioxynil  
(as 'Brittox' at 3.5 l) in 250 l.

Seed: Igri, sown at 140 kg.

Cultivations, etc.:- Heavy-tine cultivated twice, PK applied: 17 Sept,  
1981. Aldicarb applied to SOWDATE 22 SEPT, rotary harrowed, seed sown:  
22 Sept. Aldicarb applied to SOWDATE 22 OCT, rotary harrowed, seed  
sown: 22 Oct. Methabenzthiazuron applied: 28 Oct. Mecoprop,  
bromoxynil and ioxynil applied: 20 Apr, 1982. Combine harvested:  
27 July. Previous crops: W. oats 1980, potatoes 1981.

NOTES: (1) Nitrate in the soil was measured five times during the season.  
Crop height and ear numbers were measured in June. Leaf  
diseases were assessed periodically.  
(2) A cage was erected over the crop from late May to maturity to  
prevent damage by birds.

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GRAIN TONNES/HECTARE

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

N RATE	50	100	MEAN
SOWDATE			
22 SEP	8.43	8.45	8.44
22 OCT	6.93	6.65	6.79
MEAN	7.68	7.55	7.62
N TIME	22 MAR	19 APR	MEAN
SOWDATE			
22 SEP	8.33	8.55	8.44
22 OCT	6.92	6.65	6.79
MEAN	7.63	7.60	7.62
N TIME	22 MAR	19 APR	MEAN
N RATE			
50	7.64	7.73	7.68
100	7.62	7.48	7.55
MEAN	7.63	7.60	7.62
AUT PEST(1)	NONE	ALDICARB	MEAN
SOWDATE			
22 SEP	8.37	8.52	8.44
22 OCT	6.85	6.73	6.79
MEAN	7.61	7.62	7.62
AUT PEST(1)	NONE	ALDICARB	MEAN
N RATE			
50	7.66	7.70	7.68
100	7.56	7.54	7.55
MEAN	7.61	7.62	7.62
AUT PEST(1)	NONE	ALDICARB	MEAN
N TIME			
22 MAR	7.63	7.62	7.63
19 APR	7.58	7.62	7.60
MEAN	7.61	7.62	7.62
AUT PEST(2)	NONE	CHLORPYR	MEAN
AUT PEST(1)			
NONE	7.67	7.55	7.61
ALDICARB	7.72	7.53	7.62
MEAN	7.69	7.54	7.62

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GRAIN TONNES/HECTARE

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

E FUNG	NONE	TFSD	MEAN
SOWDATE			
22 SEP	8.46	8.42	8.44
22 OCT	6.83	6.75	6.79
MEAN	7.64	7.59	7.62
E FUNG	NONE	TFSD	MEAN
N RATE			
50	7.71	7.66	7.68
100	7.58	7.51	7.55
MEAN	7.64	7.59	7.62
E FUNG	NONE	TFSD	MEAN
N TIME			
22 MAR	7.67	7.59	7.63
19 APR	7.62	7.58	7.60
MEAN	7.64	7.59	7.62
E FUNG	NONE	TFSD	MEAN
AUT PEST(1)			
NONE	7.75	7.47	7.61
ALDICARB	7.54	7.71	7.62
MEAN	7.64	7.59	7.62
E FUNG	NONE	TFSD	MEAN
AUT PEST(2)			
NONE	7.72	7.66	7.69
CHLORPYR	7.57	7.51	7.54
MEAN	7.64	7.59	7.62
L FUNG	NONE	PROCHLOR	MEAN
SOWDATE			
22 SEP	8.18	8.70	8.44
22 OCT	6.63	6.94	6.79
MEAN	7.41	7.82	7.62
L FUNG	NONE	PROCHLOR	MEAN
N RATE			
50	7.44	7.93	7.68
100	7.38	7.72	7.55
MEAN	7.41	7.82	7.62

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GRAIN TONNES/HECTARE

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

L FUNG N TIME	NONE	PROCHLOR	MEAN
22 MAR	7.40	7.86	7.63
19 APR	7.42	7.79	7.60
MEAN	7.41	7.82	7.62

L FUNG AUT PEST(1)	NONE	PROCHLOR	MEAN
NONE	7.39	7.83	7.61
ALDICARB	7.43	7.82	7.62
MEAN	7.41	7.82	7.62

L FUNG AUT PEST(2)	NONE	PROCHLOR	MEAN
NONE	7.45	7.94	7.69
CHLORPYR	7.37	7.71	7.54
MEAN	7.41	7.82	7.62

L FUNG E FUNG	NONE	PROCHLOR	MEAN
NONE	7.46	7.83	7.64
TFSD	7.36	7.82	7.59
MEAN	7.41	7.82	7.62

GRTH REG SOWDATE	NONE	MEP+ETH	MEAN
22 SEP	8.22	8.66	8.44
22 OCT	6.64	6.94	6.79
MEAN	7.43	7.80	7.62

GRTH REG N RATE	NONE	MEP+ETH	MEAN
50	7.54	7.82	7.68
100	7.32	7.78	7.55
MEAN	7.43	7.80	7.62

GRTH REG N TIME	NONE	MEP+ETH	MEAN
22 MAR	7.42	7.83	7.63
19 APR	7.44	7.77	7.60
MEAN	7.43	7.80	7.62

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GRAIN TONNES/HECTARE

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

GRTH REG	NONE	MEP+ETH	MEAN
AUT PEST(1)			
NONE	7.37	7.84	7.61
ALDICARB	7.49	7.76	7.62
MEAN	7.43	7.80	7.62

GRTH REG	NONE	MEP+ETH	MEAN
AUT PEST(2)			
NONE	7.48	7.90	7.69
CHLORPYR	7.38	7.70	7.54
MEAN	7.43	7.80	7.62

GRTH REG	NONE	MEP+ETH	MEAN
E FUNG			
NONE	7.48	7.81	7.64
TFSD	7.39	7.79	7.59
MEAN	7.43	7.80	7.62

GRTH REG	NONE	MEP+ETH	MEAN
L FUNG			
NONE	7.23	7.58	7.41
PROCHLOR	7.63	8.02	7.82
MEAN	7.43	7.80	7.62

EXTRA	22 SEP 0	22 OCT 0	MEAN
	6.96	6.65	6.81

GRAND MEAN 7.57

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

SED FOR ONE WAY TABLES (EXCEPT EXTRA) IS 0.067  
 SED FOR TWO WAY TABLES IS 0.094

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

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.267	3.5
GRAIN MEAN DM%	83.7		

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STRAW TONNES/HECTARE

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

N RATE	50	100	MEAN
SOWDATE			
22 SEP	5.92	6.41	6.17
22 OCT	4.88	5.16	5.02
MEAN	5.40	5.78	5.59
N TIME	22 MAR	19 APR	MEAN
SOWDATE			
22 SEP	6.41	5.92	6.17
22 OCT	4.99	5.04	5.02
MEAN	5.70	5.48	5.59
N TIME	22 MAR	19 APR	MEAN
N RATE			
50	5.42	5.38	5.40
100	5.98	5.59	5.78
MEAN	5.70	5.48	5.59
AUT PEST(1)	NONE	ALDICARB	MEAN
SOWDATE			
22 SEP	6.14	6.19	6.17
22 OCT	5.04	4.99	5.02
MEAN	5.59	5.59	5.59
AUT PEST(1)	NONE	ALDICARB	MEAN
N RATE			
50	5.44	5.36	5.40
100	5.74	5.83	5.78
MEAN	5.59	5.59	5.59
AUT PEST(1)	NONE	ALDICARB	MEAN
N TIME			
22 MAR	5.79	5.61	5.70
19 APR	5.39	5.58	5.48
MEAN	5.59	5.59	5.59
AUT PEST(2)	NONE	CHLORPYR	MEAN
AUT PEST(1)			
NONE	5.66	5.53	5.59
ALDICARB	5.59	5.59	5.59
MEAN	5.63	5.56	5.59



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STRAW TONNES/HECTARE

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

E FUNG	NONE	TFSD	MEAN
SOWDATE			
22 SEP	6.10	6.24	6.17
22 OCT	5.05	4.98	5.02
MEAN	5.57	5.61	5.59
E FUNG	NONE	TFSD	MEAN
N RATE			
50	5.42	5.38	5.40
100	5.73	5.84	5.78
MEAN	5.57	5.61	5.59
E FUNG	NONE	TFSD	MEAN
N TIME			
22 MAR	5.69	5.72	5.70
19 APR	5.46	5.50	5.48
MEAN	5.57	5.61	5.59
E FUNG	NONE	TFSD	MEAN
AUT PEST(1)			
NONE	5.62	5.56	5.59
ALDICARB	5.53	5.66	5.59
MEAN	5.57	5.61	5.59
E FUNG	NONE	TFSD	MEAN
AUT PEST(2)			
NONE	5.55	5.70	5.63
CHLORPYR	5.60	5.51	5.56
MEAN	5.57	5.61	5.59
L FUNG	NONE	PROCHLOR	MEAN
SOWDATE			
22 SEP	5.94	6.40	6.17
22 OCT	4.82	5.21	5.02
MEAN	5.38	5.81	5.59
L FUNG	NONE	PROCHLOR	MEAN
N RATE			
50	5.25	5.55	5.40
100	5.51	6.06	5.78
MEAN	5.38	5.81	5.59

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STRAW TONNES/HECTARE

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

L FUNG	NONE	PROCHLOR	MEAN
N TIME			
22 MAR	5.43	5.97	5.70
19 APR	5.32	5.64	5.48
MEAN	5.38	5.81	5.59
L FUNG	NONE	PROCHLOR	MEAN
AUT PEST(1)			
NONE	5.34	5.84	5.59
ALDICARB	5.41	5.77	5.59
MEAN	5.38	5.81	5.59
L FUNG	NONE	PROCHLOR	MEAN
AUT PEST(2)			
NONE	5.38	5.87	5.63
CHLORPYR	5.38	5.74	5.56
MEAN	5.38	5.81	5.59
L FUNG	NONE	PROCHLOR	MEAN
E FUNG			
NONE	5.42	5.73	5.57
TFSD	5.34	5.88	5.61
MEAN	5.38	5.81	5.59
GRTH REG	NONE	MEP+ETH	MEAN
SOWDATE			
22 SEP	6.25	6.08	6.17
22 OCT	5.04	4.99	5.02
MEAN	5.64	5.54	5.59
GRTH REG	NONE	MEP+ETH	MEAN
N RATE			
50	5.48	5.32	5.40
100	5.81	5.76	5.78
MEAN	5.64	5.54	5.59
GRTH REG	NONE	MEP+ETH	MEAN
N TIME			
22 MAR	5.91	5.49	5.70
19 APR	5.38	5.59	5.48
MEAN	5.64	5.54	5.59

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STRAW TONNES/HECTARE

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

GRTH REG	NONE	MEP+ETH	MEAN
AUT PEST(1)			
NONE	5.60	5.58	5.59
ALDICARB	5.69	5.50	5.59
MEAN	5.64	5.54	5.59
GRTH REG	NONE	MEP+ETH	MEAN
AUT PEST(2)			
NONE	5.55	5.71	5.63
CHLORPYR	5.74	5.37	5.56
MEAN	5.64	5.54	5.59
GRTH REG	NONE	MEP+ETH	MEAN
E FUNG			
NONE	5.65	5.50	5.57
TFSD	5.64	5.58	5.61
MEAN	5.64	5.54	5.59
GRTH REG	NONE	MEP+ETH	MEAN
L FUNG			
NONE	5.46	5.29	5.38
PROCHLOR	5.83	5.79	5.81
MEAN	5.64	5.54	5.59

EXTRA	22 SEP 0	22 OCT 0	MEAN
	4.47	4.50	4.48

GRAND MEAN 5.53

STRAW MEAN DM% 87.8

PLOT AREA HARVESTED 0.00448