ROTHAMSTED RESEARCH

Yields of the Field Experiments 1988

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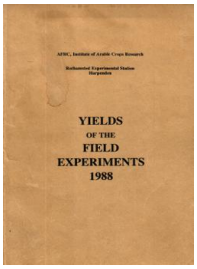

Barley

Rothamsted Research

Rothamsted Research (1989) *Barley ;* Yields Of The Field Experiments 1988, pp 168 - 197 **- DOI: https://doi.org/10.23637/ERADOC-1-43**

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WINTER BARLEY

FACTORS LIMITING YIELD

Object: To study the effects of a range of factors on the quality and yield of winter barley - Great Harpenden II.

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Associate sponsors: B.R. Kerry, G.F.J. Milford, Dr. E.D. Baxter (Brewing Research Foundation).

Design: A single replicate of 2 x 2 x 2 x 2 x 2 x 2 + 24 extra plots.

Whole plot dimensions: 3.0 x 15.2.

Treatments: All combinations of the following, all sown early (25 Sept, 1987) and given cypermethrin at 0.025 kg in 220 l on 3 Nov:

1. **PREVCROP**	Previous cropping:	
	BARLEY	S. beans 1985, w. wheat 1986, w. barley 1987
	OATS	S. beans 1985, w. wheat 1986, w. oats 1987
2. **WINTER N**	Nitrogen fertilizer in winter (kg N) as urea (46% N):	
	0	None
	NOV+FEB	On 17 Nov, 1987 33 to BARLEY, 54 to OATS, on 18 Feb, 1988 25 to BARLEY and OATS
3. **SPRING N**	Nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk':	
	125	
	200	
4. **N TIME**	Timing of spring nitrogen application:	
	14 MAR	14 March, 1988
	13 APR	13 April
5. **E FUNG**	Early fungicides:	
	NONE	None
	TFSD	Triadimenol and fuberidazole seed dressing
6. **L FUNG**	Late fungicides:	
	NONE	None
	SPRAYS	Foliar sprays of prochloraz at 0.40 kg, carbendazim at 0.15 kg and tridemorph at 0.52 kg in 220 l on 12 Apr, 1988. Propiconazole at 0.12 kg and tridemorph at 0.22 kg in 220 l on 27 May

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plus all combinations of the following all after barley and given late fungicides and 125 kg N in spring, not given cypermethrin in the autumn:

1. **SOWDATEV**

25 SEPT	25 September, 1987
26 OCT	26 October

2. **WINTR NV** Nitrogen fertilizer in winter (kg N) as urea (46 %N):

0	None
33+25	33 on 17 Nov, 1987, 25 on 18 Feb, 1988

3. **E FUNGV** Early fungicides:

NONE	None
TFSD	Triadimenol and fuberidazole seed dressing

4. **N TIMEV** Timing of spring nitrogen application:

14 MAR	14 March, 1988
13 APR	13 April

plus 2 extra treatments following fallow, sown 25 September and given early and late fungicides, cypermethrin, 125 kg spring nitrogen but not given winter nitrogen:

N TIMEF Timing of spring nitrogen application:

14 MAR	14 March, 1988 (duplicated)
13 APR	13 April (duplicated)

plus 1 extra treatment following barley, sown 25 September given early and late fungicides, cypermethrin, 200 kg spring nitrogen in April:

WINTER NX Extra winter nitrogen (kg N):

58+25	58 kg on 17 Nov, 1987, 25 kg on 18 Feb, 1988 (duplicated)

plus 1 extra treatment following barley, sown 25 September, and given early and late fungicides, cypermethrin but no nitrogen:

EXTRA NO

0+0+0	No nitrogen (duplicated)

Basal applications: Weedkillers: Glyphosate at 0.27 kg in 200 l. Chlortoluron at 3.5 kg in 200 l. Diclofop-methyl at 0.95 kg in 200 l. Fluroxypyr at 0.20 kg with clopyralid at 0.07 kg and bromoxynil at 0.34 kg in 200 l. Growth regulators: Mepiquat chloride at 0.61 kg and 2-chloroethylphosphonic acid at 0.31 kg with a wetting agent ('Cittowet' at 0.08 l) in 200 l.

Seed: Magie, sown at 300 seeds per square metre.

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Cultivations, etc.:- Rotary cultivated (fallow and barley plots only): 19 Aug, 1987. Glyphosate applied: 18 Sept. Cultivated by rotary grubber: 23 Sept. Early-sown plots rotary harrowed, seed sown: 25 Sept. Later-sown plots rotary harrowed, seed sown: 26 Oct. Chlortoluron applied: 6 Nov. Diclofop-methyl applied: 18 Nov. Remaining weedkillers applied: 25 Apr, 1988. Growth regulators with wetting agent applied: 26 Apr. Combine harvested: 4 Aug. Previous crops: W. wheat 1986, w. barley, w. oats, fallow 1987.

NOTES: (1) Soil was sampled to measure nitrate and ammonium contents in October, 1987, November and February, 1988. Crop samples were taken to measure nitrate N concentrations from November to July.
(2) Plants were sampled in March, April, June and July to measure plant and shoot numbers, dry weights and nitrogen uptakes. After harvest thousand grain weights were measured.
(3) Leaf diseases, take-all, eyespot, barley yellow dwarf virus and aphid incidence were assessed.
(4) A cage was erected over the crop from early June to maturity to prevent damage by birds.

GRAIN TONNES/HECTARE

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

WINTER N	0	NOV+FEB	Mean
PREVCROP			
BARLEY	5.38	5.73	5.56
OATS	6.08	6.56	6.32
Mean	5.73	6.15	5.94

SPRING N	125	200	Mean
PREVCROP			
BARLEY	5.26	5.86	5.56
OATS	6.19	6.45	6.32
Mean	5.72	6.15	5.94

SPRING N	125	200	Mean
WINTER N			
0	5.55	5.91	5.73
NOV+FEB	5.90	6.40	6.15
Mean	5.72	6.15	5.94

N TIME	14 MAR	13 APR	Mean
PREVCROP			
BARLEY	5.68	5.43	5.56
OATS	6.25	6.39	6.32
Mean	5.96	5.91	5.94

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GRAIN TONNES/HECTARE

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

N TIME	14 MAR	13 APR	Mean
WINTER N			
0	5.85	5.61	5.73
NOV+FEB	6.08	6.21	6.15
Mean	5.96	5.91	5.94

N TIME	14 MAR	13 APR	Mean
SPRING N			
125	5.74	5.70	5.72
200	6.19	6.12	6.15
Mean	5.96	5.91	5.94

E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	5.60	5.51	5.56
OATS	6.18	6.46	6.32
Mean	5.89	5.98	5.94

E FUNG	NONE	TFSD	Mean
WINTER N			
0	5.70	5.76	5.73
NOV+FEB	6.09	6.20	6.15
Mean	5.89	5.98	5.94

E FUNG	NONE	TFSD	Mean
SPRING N			
125	5.69	5.75	5.72
200	6.10	6.21	6.15
Mean	5.89	5.98	5.94

E FUNG	NONE	TFSD	Mean
N TIME			
14 MAR	5.80	6.13	5.96
13 APR	5.99	5.83	5.91
Mean	5.89	5.98	5.94

L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	5.27	5.84	5.56
OATS	5.85	6.79	6.32
Mean	5.56	6.31	5.94

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GRAIN TONNES/HECTARE

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

L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	5.37	6.08	5.73
NOV+FEB	5.75	6.54	6.15
Mean	5.56	6.31	5.94

L FUNG	NONE	SPRAYS	Mean
SPRING N			
125	5.52	5.92	5.72
200	5.60	6.71	6.15
Mean	5.56	6.31	5.94

L FUNG	NONE	SPRAYS	Mean
N TIME			
14 MAR	5.43	6.50	5.96
13 APR	5.69	6.13	5.91
Mean	5.56	6.31	5.94

L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	5.51	6.28	5.89
TFSD	5.61	6.35	5.98
Mean	5.56	6.31	5.94

	SPRING N	125	200
PREVCROP	**WINTER N**		
BARLEY	0	5.15	5.61
	NOV+FEB	5.36	6.10
OATS	0	5.94	6.21
	NOV+FEB	6.43	6.69

	N TIME	14 MAR	13 APR
PREVCROP	**WINTER N**		
BARLEY	0	5.61	5.15
	NOV+FEB	5.75	5.71
OATS	0	6.09	6.06
	NOV+FEB	6.41	6.71

	N TIME	14 MAR	13 APR
PREVCROP	**SPRING N**		
BARLEY	125	5.37	5.14
	200	5.98	5.73
OATS	125	6.11	6.26
	200	6.39	6.51

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GRAIN TONNES/HECTARE

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

	N TIME	14 MAR	13 APR
WINTER N	SPRING N		
0	125	5.71	5.38
	200	5.99	5.83
NOV+FEB	125	5.78	6.02
	200	6.38	6.41

	E FUNG	NONE	TFSD
PREVCROP	WINTER N		
BARLEY	0	5.41	5.35
	NOV+FEB	5.79	5.67
OATS	0	5.98	6.17
	NOV+FEB	6.39	6.74

	E FUNG	NONE	TFSD
PREVCROP	SPRING N		
BARLEY	125	5.38	5.13
	200	5.83	5.88
OATS	125	6.01	6.37
	200	6.36	6.54

	E FUNG	NONE	TFSD
WINTER N	SPRING N		
0	125	5.55	5.54
	200	5.84	5.98
NOV+FEB	125	5.83	5.97
	200	6.36	6.44

	E FUNG	NONE	TFSD
PREVCROP	N TIME		
BARLEY	14 MAR	5.53	5.83
	13 APR	5.68	5.18
OATS	14 MAR	6.07	6.43
	13 APR	6.30	6.48

	E FUNG	NONE	TFSD
WINTER N	N TIME		
0	14 MAR	5.66	6.04
	13 APR	5.73	5.49
NOV+FEB	14 MAR	5.93	6.23
	13 APR	6.25	6.18

	E FUNG	NONE	TFSD
SPRING N	N TIME		
125	14 MAR	5.56	5.93
	13 APR	5.83	5.58
200	14 MAR	6.04	6.33
	13 APR	6.16	6.09

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GRAIN TONNES/HECTARE

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

PREVCROP	L FUNG WINTER N	NONE	SPRAYS
BARLEY	0	5.15	5.61
	NOV+FEB	5.39	6.08
OATS	0	5.60	6.56
	NOV+FEB	6.11	7.01

PREVCROP	L FUNG SPRING N	NONE	SPRAYS
BARLEY	125	5.21	5.30
	200	5.32	6.39
OATS	125	5.82	6.55
	200	5.88	7.02

WINTER N	L FUNG SPRING N	NONE	SPRAYS
0	125	5.41	5.68
	200	5.33	6.49
NOV+FEB	125	5.63	6.17
	200	5.87	6.92

PREVCROP	L FUNG N TIME	NONE	SPRAYS
BARLEY	14 MAR	5.23	6.13
	13 APR	5.31	5.56
OATS	14 MAR	5.63	6.87
	13 APR	6.08	6.70

WINTER N	L FUNG N TIME	NONE	SPRAYS
0	14 MAR	5.24	6.46
	13 APR	5.51	5.71
NOV+FEB	14 MAR	5.62	6.54
	13 APR	5.88	6.55

SPRING N	L FUNG N TIME	NONE	SPRAYS
125	14 MAR	5.47	6.02
	13 APR	5.57	5.83
200	14 MAR	5.39	6.99
	13 APR	5.82	6.42

PREVCROP	L FUNG E FUNG	NONE	SPRAYS
BARLEY	NONE	5.36	5.85
	TFSD	5.17	5.84
OATS	NONE	5.66	6.71
	TFSD	6.05	6.86

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GRAIN TONNES/HECTARE

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

	L FUNG	NONE	SPRAYS
WINTER N	E FUNG		
0	NONE	5.29	6.11
	TFSD	5.46	6.06
NOV+FEB	NONE	5.74	6.45
	TFSD	5.76	6.64

	L FUNG	NONE	SPRAYS
SPRING N	E FUNG		
125	NONE	5.55	5.83
	TFSD	5.48	6.02
200	NONE	5.47	6.72
	TFSD	5.73	6.69

	L FUNG	NONE	SPRAYS
N TIME	E FUNG		
14 MAR	NONE	5.24	6.36
	TFSD	5.61	6.65
13 APR	NONE	5.78	6.20
	TFSD	5.60	6.06

WINTR NV	0	33+25	Mean
SOWDATEV			
25 SEPT	5.82	6.16	5.99
26 OCT	5.28	5.89	5.59
Mean	5.55	6.03	5.79

E FUNGV	NONE	TFSD	Mean
SOWDATEV			
25 SEPT	5.92	6.06	5.99
26 OCT	5.58	5.59	5.59
Mean	5.75	5.83	5.79

E FUNGV	NONE	TFSD	Mean
WINTR NV			
0	5.67	5.43	5.55
33+25	5.83	6.23	6.03
Mean	5.75	5.83	5.79

N TIMEV	14 MAR	13 APR	Mean
SOWDATEV			
25 SEPT	6.34	5.65	5.99
26 OCT	5.57	5.60	5.59
Mean	5.96	5.62	5.79

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GRAIN TONNES/HECTARE

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

N TIMEV WINTR NV	14 MAR	13 APR	Mean
0	5.64	5.46	5.55
33+25	6.27	5.79	6.03
Mean	5.96	5.62	5.79

N TIMEV E FUNGV	14 MAR	13 APR	Mean
NONE	6.07	5.43	5.75
TFSD	5.84	5.82	5.83
Mean	5.96	5.62	5.79

SOWDATEV	E FUNGV WINTR NV	NONE	TFSD
25 SEPT	0	5.81	5.84
	33+25	6.03	6.29
26 OCT	0	5.54	5.02
	33+25	5.62	6.16

SOWDATEV	N TIMEV WINTR NV	14 MAR	13 APR
25 SEPT	0	6.20	5.44
	33+25	6.48	5.85
26 OCT	0	5.09	5.48
	33+25	6.06	5.72

SOWDATEV	N TIMEV E FUNGV	14 MAR	13 APR
25 SEPT	NONE	6.35	5.48
	TFSD	6.32	5.81
26 OCT	NONE	5.78	5.38
	TFSD	5.36	5.82

WINTR NV	N TIMEV E FUNGV	14 MAR	13 APR
0	NONE	5.96	5.39
	TFSD	5.33	5.53
33+25	NONE	6.18	5.47
	TFSD	6.35	6.10

SOWDATEV	WINTR NV	N TIMEV E FUNGV	14 MAR	13 APR
25 SEPT	0	NONE	6.05	5.56
		TFSD	6.34	5.33
	33+25	NONE	6.66	5.41
		TFSD	6.29	6.29
26 OCT	0	NONE	5.86	5.23
		TFSD	4.32	5.73
	33+25	NONE	5.71	5.54
		TFSD	6.41	5.91

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GRAIN TONNES/HECTARE

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

N TIMEF	14 MAR	13 APR	Mean
	6.04	6.32	6.18

WINTER NX	58+25
	6.00

EXTRA NO	0+0+0
	1.68

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

(not including extra plots)

Margin of two factor tables	0.123
Two factor tables	0.174
Three factor tables	0.246

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

Stratum	d.f.	s.e.	cv%
WP	22	0.492	8.3

GRAIN MEAN DM% 80.9

STRAW TONNES/HECTARE

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

WINTER N	0	NOV+FEB	Mean
PREVCROP			
BARLEY	3.01	3.29	3.15
OATS	3.89	4.07	3.98
Mean	3.45	3.68	3.57

SPRING N	125	200	Mean
PREVCROP			
BARLEY	3.04	3.26	3.15
OATS	3.85	4.11	3.98
Mean	3.45	3.68	3.57

SPRING N	125	200	Mean
WINTER N			
0	3.35	3.56	3.45
NOV+FEB	3.55	3.81	3.68
Mean	3.45	3.68	3.57

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STRAW TONNES/HECTARE

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

N TIME	14 MAR	13 APR	Mean
PREVCROP			
BARLEY	3.21	3.09	3.15
OATS	3.86	4.09	3.98
Mean	3.54	3.59	3.57

N TIME	14 MAR	13 APR	Mean
WINTER N			
0	3.41	3.49	3.45
NOV+FEB	3.67	3.69	3.68
Mean	3.54	3.59	3.57

N TIME	14 MAR	13 APR	Mean
SPRING N			
125	3.37	3.52	3.45
200	3.71	3.66	3.68
Mean	3.54	3.59	3.57

E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	3.17	3.13	3.15
OATS	3.90	4.06	3.98
Mean	3.54	3.59	3.57

E FUNG	NONE	TFSD	Mean
WINTER N			
0	3.40	3.50	3.45
NOV+FEB	3.67	3.69	3.68
Mean	3.54	3.59	3.57

E FUNG	NONE	TFSD	Mean
SPRING N			
125	3.44	3.45	3.45
200	3.63	3.74	3.68
Mean	3.54	3.59	3.57

E FUNG	NONE	TFSD	Mean
N TIME			
14 MAR	3.60	3.47	3.54
13 APR	3.47	3.72	3.59
Mean	3.54	3.59	3.57

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STRAW TONNES/HECTARE

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

L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	2.86	3.44	3.15
OATS	3.73	4.23	3.98
Mean	3.29	3.84	3.57

L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	3.21	3.70	3.45
NOV+FEB	3.38	3.97	3.68
Mean	3.29	3.84	3.57

L FUNG	NONE	SPRAYS	Mean
SPRING N			
125	3.23	3.67	3.45
200	3.36	4.01	3.68
Mean	3.29	3.84	3.57

L FUNG	NONE	SPRAYS	Mean
N TIME			
14 MAR	3.14	3.94	3.54
13 APR	3.45	3.73	3.59
Mean	3.29	3.84	3.57

L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	3.27	3.81	3.54
TFSD	3.32	3.87	3.59
Mean	3.29	3.84	3.57

	SPRING N	125	200
PREVCROP	**WINTER N**		
BARLEY	0	2.92	3.11
	NOV+FEB	3.17	3.41
OATS	0	3.77	4.01
	NOV+FEB	3.92	4.21

	N TIME	14 MAR	13 APR
PREVCROP	**WINTER N**		
BARLEY	0	3.00	3.03
	NOV+FEB	3.43	3.15
OATS	0	3.82	3.96
	NOV+FEB	3.91	4.23

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STRAW TONNES/HECTARE

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

	N TIME	14 MAR	13 APR
PREVCROP	SPRING N		
BARLEY	125	3.04	3.05
	200	3.39	3.13
OATS	125	3.70	4.00
	200	4.03	4.19

	N TIME	14 MAR	13 APR
WINTER N	SPRING N		
0	125	3.16	3.53
	200	3.66	3.46
NOV+FEB	125	3.57	3.52
	200	3.76	3.86

	E FUNG	NONE	TFSD
PREVCROP	WINTER N		
BARLEY	0	2.90	3.13
	NOV+FEB	3.45	3.13
OATS	0	3.91	3.87
	NOV+FEB	3.89	4.25

	E FUNG	NONE	TFSD
PREVCROP	SPRING N		
BARLEY	125	3.11	2.98
	200	3.24	3.28
OATS	125	3.78	3.91
	200	4.01	4.21

	E FUNG	NONE	TFSD
WINTER N	SPRING N		
0	125	3.23	3.46
	200	3.58	3.54
NOV+FEB	125	3.66	3.43
	200	3.68	3.94

	E FUNG	NONE	TFSD
PREVCROP	N TIME		
BARLEY	14 MAR	3.29	3.13
	13 APR	3.05	3.12
OATS	14 MAR	3.92	3.81
	13 APR	3.88	4.31

	E FUNG	NONE	TFSD
WINTER N	N TIME		
0	14 MAR	3.42	3.39
	13 APR	3.38	3.61
NOV+FEB	14 MAR	3.78	3.55
	13 APR	3.55	3.83

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STRAW TONNES/HECTARE

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

	E FUNG	NONE	TFSD
SPRING N	**N TIME**		
125	14 MAR	3.45	3.28
	13 APR	3.44	3.61
200	14 MAR	3.76	3.66
	13 APR	3.50	3.82

	L FUNG	NONE	SPRAYS
PREVCROP	**WINTER N**		
BARLEY	0	2.78	3.25
	NOV+FEB	2.94	3.64
OATS	0	3.63	4.15
	NOV+FEB	3.83	4.31

	L FUNG	NONE	SPRAYS
PREVCROP	**SPRING N**		
BARLEY	125	2.79	3.30
	200	2.93	3.59
OATS	125	3.66	4.04
	200	3.80	4.42

	L FUNG	NONE	SPRAYS
WINTER N	**SPRING N**		
0	125	3.11	3.58
	200	3.30	3.82
NOV+FEB	125	3.34	3.75
	200	3.43	4.19

	L FUNG	NONE	SPRAYS
PREVCROP	**N TIME**		
BARLEY	14 MAR	2.83	3.60
	13 APR	2.89	3.29
OATS	14 MAR	3.45	4.28
	13 APR	4.01	4.18

	L FUNG	NONE	SPRAYS
WINTER N	**N TIME**		
0	14 MAR	2.99	3.83
	13 APR	3.42	3.57
NOV+FEB	14 MAR	3.28	4.05
	13 APR	3.48	3.89

	L FUNG	NONE	SPRAYS
SPRING N	**N TIME**		
125	14 MAR	3.16	3.57
	13 APR	3.29	3.76
200	14 MAR	3.12	4.31
	13 APR	3.61	3.71

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STRAW TONNES/HECTARE

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

PREVCROP	L FUNG / E FUNG	NONE	SPRAYS
BARLEY	NONE	2.88	3.46
	TFSD	2.84	3.42
OATS	NONE	3.65	4.15
	TFSD	3.81	4.31

WINTER N	L FUNG / E FUNG	NONE	SPRAYS
0	NONE	3.18	3.63
	TFSD	3.23	3.76
NOV+FEB	NONE	3.35	3.98
	TFSD	3.41	3.97

SPRING N	L FUNG / E FUNG	NONE	SPRAYS
125	NONE	3.27	3.62
	TFSD	3.18	3.71
200	NONE	3.26	3.99
	TFSD	3.46	4.02

N TIME	L FUNG / E FUNG	NONE	SPRAYS
14 MAR	NONE	3.15	4.06
	TFSD	3.12	3.82
13 APR	NONE	3.38	3.56
	TFSD	3.53	3.91

WINTR NV / SOWDATEV	0	33+25	Mean
25 SEPT	3.39	3.61	3.50
26 OCT	3.70	3.90	3.80
Mean	3.54	3.75	3.65

E FUNGV / SOWDATEV	NONE	TFSD	Mean
25 SEPT	3.34	3.66	3.50
26 OCT	3.50	4.10	3.80
Mean	3.42	3.88	3.65

E FUNGV / WINTR NV	NONE	TFSD	Mean
0	3.32	3.77	3.54
33+25	3.52	3.99	3.75
Mean	3.42	3.88	3.65

https://doi.org/10.23637/ERADOC-1-43

88/R/B/1

STRAW TONNES/HECTARE

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

N TIMEV	14 MAR	13 APR	Mean
SOWDATEV			
25 SEPT	3.83	3.17	3.50
26 OCT	3.84	3.76	3.80
Mean	3.83	3.47	3.65

N TIMEV	14 MAR	13 APR	Mean
WINTR NV			
0	3.58	3.51	3.54
33+25	4.08	3.43	3.75
Mean	3.83	3.47	3.65

N TIMEV	14 MAR	13 APR	Mean
E FUNGV			
NONE	3.68	3.16	3.42
TFSD	3.98	3.77	3.88
Mean	3.83	3.47	3.65

	E FUNGV	NONE	TFSD
SOWDATEV	**WINTR NV**		
25 SEPT	0	3.29	3.50
	33+25	3.39	3.82
26 OCT	0	3.35	4.04
	33+25	3.65	4.15

	N TIMEV	14 MAR	13 APR
SOWDATEV	**WINTR NV**		
25 SEPT	0	3.59	3.19
	33+25	4.06	3.15
26 OCT	0	3.58	3.82
	33+25	4.10	3.70

	N TIMEV	14 MAR	13 APR
SOWDATEV	**E FUNGV**		
25 SEPT	NONE	3.69	2.98
	TFSD	3.96	3.36
26 OCT	NONE	3.67	3.33
	TFSD	4.01	4.18

	N TIMEV	14 MAR	13 APR
WINTR NV	**E FUNGV**		
0	NONE	3.41	3.22
	TFSD	3.76	3.79
33+25	NONE	3.95	3.09
	TFSD	4.21	3.76

https://doi.org/10.23637/ERADOC-1-43

88/R/B/1

STRAW TONNES/HECTARE

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

SOWDATEV	WINTR NV	N TIMEV E FUNGV	14 MAR	13 APR
25 SEPT	0	NONE	3.33	3.24
		TFSD	3.85	3.15
	33+25	NONE	4.05	2.73
		TFSD	4.07	3.57
26 OCT	0	NONE	3.49	3.21
		TFSD	3.67	4.42
	33+25	NONE	3.85	3.46
		TFSD	4.35	3.95

N TIMEF	14 MAR	13 APR	Mean
	3.30	3.85	3.58

WINTER NX	58+25
	3.76

EXTRA NO	0+0+0
	0.76

STRAW MEAN DM% 86.9

PLOT AREA HARVESTED 0.00210

https://doi.org/10.23637/ERADOC-1-43

88/R/B/2

WINTER BARLEY

SOWING DATES, APHIDS AND BYDV

Object: To study the relationship of aphid numbers in suction trap samples to crop populations and the incidence of BYDV on winter barley sown on a range of dates - Great Field II.

Sponsors: N. Carter, R.T. Plumb.

Design: 4 randomised blocks of 10 plots.

Whole plot dimensions: 3.0 x 23.0.

Treatments: All combinations of:-

1. **SOWDATE** Dates of sowing:

10 SEPT	10 September, 1987
21 SEPT	21 September
30 SEPT	30 September
14 OCT	14 October
26 OCT	26 October

2. **APHICIDE** Aphicide:

NONE	None
CYPERMET	Cypermethrin at 0.025 kg in 380 l on 13 Nov, 1987

NOTES: (1) All SOWDATE treatments were rotary harrowed on the day of sowing.
(2) The crop was netted against birds from late June until maturity.

Basal applications: Manures: 'Nitram' at 120 kg and later at 480 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Fluroxypyr at 0.20 kg with clopyralid at 0.07 kg and bromoxynil at 0.34 kg in 200 l. Isoproturon at 2.1 kg applied with the prochloraz and carbendazim in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.:- Spring-tine cultivated: 15 Aug, 1987. Glyphosate applied: 8 Sept. Heavy spring-tine cultivated twice: 10 Sept. N applied: 2 Mar, 1988, 8 Apr. Fluroxypyr with clopyralid and bromoxynil applied: 25 Apr. Isoproturon with prochloraz and carbendazim applied: 6 May. Propiconazole and tridemorph applied: 3 June. Combine harvested: 4 Aug. Previous crops: W. barley 1986 and 1987.

NOTE: Aphids were counted from late September to February and again in May. Visual estimates of BYDV were made at the end of April. Components of yield were measured. Take-all was assessed in summer.

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88/R/B/2

GRAIN TONNES/HECTARE

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

APHICIDE SOWDATE	NONE	CYPERMET	Mean
10 SEPT	3.85	3.81	3.83
21 SEPT	5.28	5.36	5.32
30 SEPT	5.60	5.07	5.34
14 OCT	1.25	1.82	1.53
26 OCT	3.94	3.42	3.68
Mean	3.98	3.90	3.94

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

SOWDATE	APHICIDE	SOWDATE APHICIDE
0.318	0.201	0.450

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.636	16.1

GRAIN MEAN DM% 73.6

PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-43

88/R/B/3

WINTER BARLEY

ALARM PHEROMONE AND BYDV

Object: To determine whether the use of aphid alarm pheromone allows control of BYDV to be achieved with a decreased rate of insecticide - Scout N.

Sponsors: D.C. Griffiths, L.E. Smart, R.T. Plumb.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 6.0 x 8.0.

Treatments:

INS PHE	Sprays of insecticide and alarm pheromone:
NONE	None
A	Alarm pheromone
FEN1	Fenvalerate at 9.55 g
FEN1+A	Fenvalerate at 9.55 g + alarm pheromone
FEN2	Fenvalerate at 19.1 g
FEN2+A	Fenvalerate at 19.1 g + alarm pheromone

NOTES: (1) Treatments were applied in 200 l on 22 Oct, 1987.
(2) The alarm pheromone was E-beta-farnesene applied at 0.20 kg.

Basal applications: Manures: 'Nitram' at 120 kg and later at 480 kg. Weedkillers: Chlortoluron at 3.5 kg with bromoxynil at 0.19 kg and ioxynil at 0.19 kg in 200 l. Fluroxypyr at 0.20 kg applied with the prochloraz and carbendazim in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.:- Disced: 14 Aug, 1987. Ploughed, rotary harrowed, seed sown: 22 Sept. Chlortoluron, bromoxynil and ioxynil applied: 6 Nov. First N applied: 29 Feb, 1988. Second N applied: 7 Apr. Fluroxypyr with prochloraz and carbendazim applied: 6 May. Remaining fungicides applied: 20 May. Combine harvested: 3 Aug. Previous crops: W. barley 1986 and 1987.

NOTE: Aphids were counted soon after treatment and again in April 1988. Observations were made during the season of incidence of BYDV.

https://doi.org/10.23637/ERADOC-1-43

88/R/B/3

GRAIN TONNES/HECTARE

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

INS PHE	NONE	A	FEN1	FEN1+A	FEN2	FEN2+A	Mean
	7.09	7.48	7.74	8.03	8.04	7.74	7.69

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

INS PHE
0.324

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.458	6.0

GRAIN MEAN DM% 84.5

PLOT AREA HARVESTED 0.00163

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88/R/B/5

WINTER BARLEY

VARIETIES

Object: To study the yields of some of the newer winter barley varieties - Great Harpenden II.

Sponsors: R. Moffitt, J.F. Jenkyn.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

VARIETY	Varieties:
GERBEL	Gerbel (6 row)
IGRI	Igri
KASKADE	Kaskade
MAGIE	Magie
MG 33+0	Magie with 33 kg extra N applied on 17 Nov, 1987
MG 0+25	Magie with 25 kg extra N applied on 18 Feb, 1988
MG 33+25	Magie with extra N applied on both the above dates
MG S600	Magie with 'Seamac 600' spray
MARINKA	Marinka
PIRATE	Pirate (6 row)
PLAISANT	Plaisant (6 row)
VIXEN	Vixen

NOTES: (1) The extra N for **VARIETY** MG was applied as urea.
(2) The 'Seamac 600' was applied at 5.6 l in 220 l on 11 Apr, 1988.

Basal applications: Manures: 'Nitram' at 580 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Chlortoluron at 3.5 kg in 200 l. Fluroxypyr at 0.20 kg with clopyralid at 0.07 kg and bromoxynil at 0.34 kg in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l. Growth regulators: Mepiquat chloride at 0.61 kg and 2-chloroethylphosphonic acid at 0.31 kg with a wetting agent ('Cittowet' at 0.08 l) in 200 l.

Seed: Varieties, sown at 150 kg.

Cultivations, etc.:- Cultivated by rotary grubber: 18 Aug, 1987. Glyphosate applied: 18 Sept. Rotary harrowed: 29 Sept. Rotary harrowed, seed sown: 30 Sept. Chlortoluron applied: 6 Nov. N applied: 18 Mar, 1988. Prochloraz and carbendazim applied: 21 Apr. Remaining weedkillers applied: 25 Apr. Growth regulators with wetting agent applied: 26 Apr. Remaining fungicides applied: 26 May. Combine harvested: 3 Aug. Previous crops: W. wheat 1986, w. barley 1987.

NOTES: (1) Samples were taken for disease assessment in June.
(2) Malting quality was assessed on the grain from some treatments.

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88/R/B/5

GRAIN TONNES/HECTARE

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

VARIETY	
GERBEL	7.21
IGRI	6.95
KASCADE	6.18
MAGIE	5.99
MG 33+0	6.01
MG 0+25	6.60
MG 33+25	6.48
MG S600	6.26
MARINKA	7.32
PIRATE	7.66
PLAISANT	6.72
VIXEN	7.42
Mean	6.73

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

VARIETY
0.334

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	33	0.473	7.0

GRAIN MEAN DM% 85.3

PLOT AREA HARVESTED 0.00203

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88/R/B/6

WINTER BARLEY

HARVEST DATES AND MALTING QUALITY

Object: To investigate the effects of harvest dates on yield and malting quality of winter barley - Appletree.

Sponsor: J.F. Jenkyn.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 3.0 x 14.0.

Treatments:

HARVDATE	Harvest dates:
V EARLY	Very early on 27 July, 1988
EARLY	Early on 5 Aug
OPTIMUM	Optimum on 12 Aug
LATE	Late on 18 Aug
V LATE	Very late on 26 Aug

Basal applications: Manures: 'Nitram' at 120 kg and later at 250 kg. Weedkillers: Fluroxypyr at 0.20 kg with clopyralid at 0.07 kg and bromoxynil at 0.34 kg in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l.

Seed: Magie, sown at 160 kg.

Cultivations, etc.:- Cultivated by rotary grubber: 26 Sept, 1987. Ploughed, rotary harrowed, seed sown: 7 Nov. First N applied: 2 Mar, 1988. Second N applied: 8 Apr. Prochloraz and carbendazim applied: 21 Apr. Weedkillers applied: 26 Apr. Remaining fungicides applied: 17 May. Previous crops: Potatoes 1986, w. wheat 1987.

NOTE: Malting quality was assessed on the grain.

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88/R/B/6

GRAIN TONNES/HECTARE

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

HARVDATE	
V EARLY	6.41
EARLY	6.67
OPTIMUM	6.53
LATE	6.77
V LATE	6.57
Mean	6.59

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

HARVDATE
0.173

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.244	3.7

GRAND MEAN DM% 80.3

PLOT AREA HARVESTED 0.00434

https://doi.org/10.23637/ERADOC-1-43 *pp 26*

88/R/B/9 and 88/W/B/9

SPRING BARLEY

VARIETIES AND N

Object: To study the yields of some of the newer varieties of s. barley at two rates of nitrogen - Rothamsted (R) Highfield V and Woburn (W) Horsepool Lane Close E.

Sponsor: R. Moffitt.

Design: 3 (R) and 2 (W) randomised blocks of 2 plots split into 13.

Sub-plot dimensions: (R) 3.0 x 10.0. (W) 4.0 x 8.0.

Treatments: All combinations of:-

Whole plots

1. **N** Nitrogen fertilizer (kg N), as 'Nitram':

(R)	(W)
125	117
170	157

Sub plots

2. **VARIETY** Varieties:

BLENHEIM	Blenheim
CAMEO	Cameo
CORNICHE	Corniche
DIGGER	Digger
DOUBLET	Doublet
FERGIE	Fergie
JOLENE	Jolene
KLAXON	Klaxon
NATASHA	Natasha
PRISMA	Prisma
REGATTA	Regatta
TRIUMPH	Triumph
TRIUMPHB	Triumph + 'Baytan' seed dressing

Basal applications:
Highfield V (R): Manures: (0:18:36) at 690 kg. FYM at 35 t.
Weedkillers: Mecoprop at 2.4 kg with clopyralid at 0.05 kg and bromoxynil at 0.24 kg in 200 l. Glyphosate at 1.1 kg in 200 l.
Fungicides: Tridemorph at 0.52 kg in 200 l. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l.
Horsepool Lane Close E (W): Weedkillers: Bromoxynil at 0.24 kg and clopyralid at 0.05 kg with mecoprop at 2.1 kg in 220 l.
Fungicide: Tridemorph at 0.52 kg in 220 l.

Seed: Highfield V (R): Sown at 160 kg.
Horsepool Lane Close E (W): Sown at 150 kg.

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88/R/B/9 and 88/W/B/9

Cultivations, etc.:-

Highfield V (R): PK applied: 15 Oct, 1987. FYM applied: 15 Dec. Ploughed: 18 Dec. Heavy spring-tine cultivated: 1 Mar, 1988. Rolled: 8 Mar. Rotary harrowed, seed sown, harrowed: 31 Mar. N treatments applied: 28 Apr. Weedkillers other than glyphosate applied: 10 May. Tridemorph applied: 27 May. Propiconazole and tridemorph applied: 16 June. Glyphosate applied: 9 Aug. Combine harvested: 17 Aug. Previous crops: S. barley and potatoes 1986, s. barley 1987.

Horsepool Lane Close E (W): Ploughed: 10 Mar. Disced twice: 29 Mar, 30 Mar. Spike harrowed with crumbler attached, rotary harrowed with crumbler attached, seed sown: 31 Mar. N treatments applied: 3 May. Weedkillers applied: 17 May. Fungicide applied: 27 May. Combine harvested: 22 Aug. Previous crops: Potatoes 1986, s. barley 1987.

88/R/B/9 HIGHFIELD V (R)

GRAIN TONNES/HECTARE

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

N	125	170	Mean
VARIETY			
BLENHEIM	7.12	6.96	7.04
CAMEO	7.30	7.03	7.16
CORNICHE	6.03	6.26	6.14
DIGGER	6.20	6.56	6.38
DOUBLET	6.35	6.58	6.46
FERGIE	6.33	5.51	5.92
JOLENE	6.10	6.65	6.37
KLAXON	6.45	6.39	6.42
NATASHA	6.36	6.77	6.57
PRISMA	6.05	6.26	6.15
REGATTA	6.68	6.29	6.49
TRIUMPH	6.49	6.30	6.39
TRIUMPHB	6.05	5.74	5.90
Mean	6.42	6.41	6.41

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

VARIETY	N*
	VARIETY
0.304	0.430

* Within the same level of **N** only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	48	0.527	8.2

GRAIN MEAN DM% 82.3

SUB PLOT AREA HARVESTED 0.00204

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88/W/B/9 HORSEPOOL LANE CLOSE E (W)

GRAIN TONNES/HECTARE

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

N	117	157	Mean
VARIETY			
BLENHEIM	4.86	4.97	4.91
CAMEO	4.86	5.24	5.05
CORNICHE	4.85	4.91	4.88
DIGGER	4.69	4.99	4.84
DOUBLET	4.66	4.70	4.68
FERGIE	4.50	4.91	4.71
JOLENE	4.82	4.78	4.80
KLAXON	4.71	5.53	5.12
NATASHA	4.33	4.29	4.31
PRISMA	3.79	3.30	3.55
REGATTA	5.06	4.63	4.84
TRIUMPH	4.95	4.26	4.61
TRIUMPHB	4.57	3.83	4.20
Mean	4.66	4.64	4.65

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

VARIETY	N* VARIETY
0.337	0.476

* Within the same level of **N** only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	24	0.476	10.2

GRAIN MEAN DM% 81.4

SUB PLOT AREA HARVESTED 0.00220

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88/R/B/10

SPRING BARLEY

HARVEST DATES AND MALTING QUALITY

Object: To investigate the effects of harvest date on yield and malting quality of spring barley - Bones Close.

Sponsor: J.F. Jenkyn.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments:

HARVDATE	Date of harvest:
NOGRN	Green tissue virtually absent
NOGRN+10	Green tissue virtually absent + 10 days
OPT	Optimum maturity
OPT+10	Optimum maturity + 10 days
OPT+20	Optimum maturity + 20 days

NOTE: Above stages were targets. Actual dates of harvest were 12 Aug, 1988, 18 Aug, 26 Aug, 5 Sept, 13 Sept.

Basal applications: Manures: 'Nitram' at 220 kg. Weedkillers: Mecoprop at 2.4 kg with clopyralid at 0.05 kg and bromoxynil at 0.24 kg in 200 l. Fungicides: Fenpropimorph at 0.75 kg in 200 l. Propiconazole at 0.12 kg and tridemorph at 0.25 kg in 200 l.

Seed: Triumph, dressed triadimenol and fuberidazole, sown at 160 kg.

Cultivations, etc.:- Cultivated by rotary digger and deep-tine cultivated with vibrating tines about 60 cm apart, 45 cm deep: 12 Dec, 1987. Heavy spring-tine cultivated, N applied, rotary harrowed, seed sown: 7 Mar, 1988. Weedkillers applied: 11 May. Fenpropimorph applied: 17 May. Remaining fungicides applied: 16 June. Previous crops: W. barley 1986, potatoes 1987.

NOTE: Malting quality was assessed on the grain.

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88/R/B/10

GRAIN TONNES/HECTARE

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

HARVDATE	
NOGRN	8.70
NOGRN+10	8.57
OPT	8.17
OPT+10	7.86
OPT+20	7.81
Mean	8.22

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

HARVDATE
0.334

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.472	5.7

GRAIN MEAN DM% 79.7

PLOT AREA HARVESTED 0.00378

https://doi.org/10.23637/ERADOC-1-43