ROTHAMSTED RESEARCH

Yields of the Field Experiments 1989

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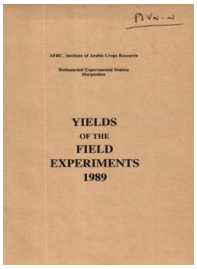

Barley

Rothamsted Research

Rothamsted Research (1990) *Barley ;* Yields Of The Field Experiments 1989, pp 136 - 161 **- DOI: https://doi.org/10.23637/ERADOC-1-40**

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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 Knott I.

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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 18.2.

Treatments: All combinations of the following, all sown early (20 Sept, 1988) and given cypermethrin at 0.025 kg in 220 l on 28 Oct:

1. **PREVCROP**	Previous cropping:	
	BARLEY	Potatoes 1986, w. wheat 1987, w. barley 1988
	OATS	Potatoes 1986, w. wheat 1987, w. oats 1988
2. **WINTER N**	Nitrogen fertilizer in winter (kg N) as urea (46% N):	
	0	None
	NOV+FEB	On 16 Nov, 1988 20 to BARLEY, 49 to OATS, on 20 Feb, 1989 25 to BARLEY and OATS
3. **SPRING N**	Nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk':	
	85	
	160	
4. **N TIME**	Timing of spring nitrogen application:	
	14 MAR	14 March, 1989
	10 APR	10 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 0.38 kg in 220 l on 12 Apr, 1989. Propiconazole at 0.125 kg and tridemorph at 0.22 kg in 220 l on 19 May

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plus all combinations of the following, all after barley and given late fungicides and 85 kg N in spring, not given cypermethrin in the autumn:

1. **SOWDATEV** Sowing dates:

20 SEPT	20 September, 1988
17 OCT	17 October

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

0	None
20+25	20 on 16 Nov, 1988, 25 on 20 Feb, 1989

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, 1989
10 APR	10 April

plus 2 extra treatments following fallow, sown 20 September and given early and late fungicides, cypermethrin, 85 kg spring nitrogen but not given winter nitrogen:

N TIMEF Timing of spring nitrogen application:

14 MAR	14 March, 1989 (duplicated)
10 APR	10 April (duplicated)

plus 1 extra treatment following barley, sown 20 September given early and late fungicides, cypermethrin, 160 kg spring nitrogen in April:

WINTER NX Extra winter nitrogen (kg N):

45+25	45 kg on 16 Nov, 1988, 25 kg on 20 Feb, 1989 (duplicated)

plus 1 extra treatment following barley, sown 20 September, and given early and late fungicides, cypermethrin but no nitrogen:

EXTRA NO

0+0+0	No nitrogen (duplicated)

Basal applications: Manure: Magnesian limestone at 5.0 t. Weedkillers: Glyphosate at 0.27 kg in 200 l. Paraquat at 0.60 kg ion in 200 l. Chlortoluron at 3.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with isoproturon at 1.5 kg in 200 l. Growth regulators: 2-chloroethyl-phosphonic acid at 0.31 kg and mepiquat chloride at 0.61 kg with a wetting agent ('Citowett' at 0.08 l) in 200 l.

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

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Cultivations, etc.:- Rotary cultivated : 10 Aug, 1988. Glyphosate applied, magnesian limestone applied: 6 Sept. Paraquat applied: 19 Sept. Cultivated with rotary grubber, rotary harrowed, first sowing date plots rotary harrowed again, seed sown: 20 Sept. Second sowing date plots rotary harrowed, seed sown: 17 Oct. Chlortoluron applied: 15 Nov. Growth regulators with wetting agent applied: 19 Apr, 1989. Metsulfuron-methyl with isoproturon applied: 26 Apr. Combine harvested: 13 July. Previous crops: S. barley, w. wheat 1987, w. barley, w. oats, fallow 1988.

NOTES: (1) Soil was sampled to measure nitrate and ammonium contents in October, 1988 and February, 1989. Crop samples were taken from November to June to measure nitrate N concentrations.
(2) Plants were sampled in March, April, May 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 numbers were assessed.

GRAIN TONNES/HECTARE

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

WINTER N	0	NOV+FEB	Mean
PREVCROP			
BARLEY	6.98	7.75	7.36
OATS	7.36	7.95	7.65
Mean	7.17	7.85	7.51

E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	7.22	7.51	7.36
OATS	7.64	7.67	7.65
Mean	7.43	7.59	7.51

E FUNG	NONE	TFSD	Mean
WINTER N			
0	7.05	7.28	7.17
NOV+FEB	7.81	7.90	7.85
Mean	7.43	7.59	7.51

L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	6.94	7.79	7.36
OATS	7.27	8.04	7.65
Mean	7.10	7.92	7.51

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GRAIN TONNES/HECTARE

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

L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	6.90	7.44	7.17
NOV+FEB	7.31	8.40	7.85
Mean	7.10	7.92	7.51

L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	6.99	7.87	7.43
TFSD	7.21	7.97	7.59
Mean	7.10	7.92	7.51

SPRING N	85	160	Mean
PREVCROP			
BARLEY	7.11	7.62	7.36
OATS	7.48	7.83	7.65
Mean	7.30	7.72	7.51

SPRING N	85	160	Mean
WINTER N			
0	6.89	7.44	7.17
NOV+FEB	7.70	8.00	7.85
Mean	7.30	7.72	7.51

SPRING N	85	160	Mean
E FUNG			
NONE	7.22	7.64	7.43
TFSD	7.37	7.81	7.59
Mean	7.30	7.72	7.51

SPRING N	85	160	Mean
L FUNG			
NONE	6.89	7.32	7.10
SPRAYS	7.71	8.13	7.92
Mean	7.30	7.72	7.51

N TIME	14 MAR	10 APR	Mean
PREVCROP			
BARLEY	7.48	7.25	7.36
OATS	7.67	7.64	7.65
Mean	7.58	7.44	7.51

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GRAIN TONNES/HECTARE

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

N TIME / WINTER N	14 MAR	10 APR	Mean
0	7.32	7.01	7.17
NOV+FEB	7.83	7.87	7.85
Mean	7.58	7.44	7.51

N TIME / E FUNG	14 MAR	10 APR	Mean
NONE	7.59	7.27	7.43
TFSD	7.56	7.62	7.59
Mean	7.58	7.44	7.51

N TIME / L FUNG	14 MAR	10 APR	Mean
NONE	7.09	7.12	7.10
SPRAYS	8.07	7.77	7.92
Mean	7.58	7.44	7.51

N TIME / SPRING N	14 MAR	10 APR	Mean
85	7.29	7.30	7.30
160	7.86	7.59	7.72
Mean	7.58	7.44	7.51

	E FUNG	NONE	TFSD
PREVCROP	WINTER N		
BARLEY	0	6.74	7.22
	NOV+FEB	7.69	7.81
OATS	0	7.37	7.35
	NOV+FEB	7.92	7.99

	L FUNG	NONE	SPRAYS
PREVCROP	WINTER N		
BARLEY	0	6.74	7.22
	NOV+FEB	7.13	8.37
OATS	0	7.05	7.66
	NOV+FEB	7.48	8.43

	L FUNG	NONE	SPRAYS
PREVCROP	E FUNG		
BARLEY	NONE	6.70	7.73
	TFSD	7.17	7.86
OATS	NONE	7.27	8.01
	TFSD	7.26	8.08

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GRAIN TONNES/HECTARE

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

	L FUNG	NONE	SPRAYS
WINTER N	E FUNG		
0	NONE	6.80	7.31
	TFSD	7.00	7.57
NOV+FEB	NONE	7.18	8.43
	TFSD	7.43	8.36

	SPRING N	85	160
PREVCROP	WINTER N		
BARLEY	0	6.65	7.31
	NOV+FEB	7.57	7.93
OATS	0	7.14	7.58
	NOV+FEB	7.82	8.08

	SPRING N	85	160
PREVCROP	E FUNG		
BARLEY	NONE	6.93	7.51
	TFSD	7.30	7.72
OATS	NONE	7.52	7.76
	TFSD	7.44	7.90

	SPRING N	85	160
WINTER N	E FUNG		
0	NONE	6.80	7.31
	TFSD	6.99	7.58
NOV+FEB	NONE	7.65	7.96
	TFSD	7.75	8.05

	SPRING N	85	160
PREVCROP	L FUNG		
BARLEY	NONE	6.68	7.19
	SPRAYS	7.55	8.04
OATS	NONE	7.09	7.44
	SPRAYS	7.87	8.22

	SPRING N	85	160
WINTER N	L FUNG		
0	NONE	6.66	7.13
	SPRAYS	7.13	7.75
NOV+FEB	NONE	7.11	7.50
	SPRAYS	8.28	8.51

	SPRING N	85	160
E FUNG	L FUNG		
NONE	NONE	6.74	7.23
	SPRAYS	7.71	8.04
TFSD	NONE	7.03	7.40
	SPRAYS	7.71	8.23

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GRAIN TONNES/HECTARE

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

N TIME	14 MAR	10 APR
PREVCROP WINTER N		
BARLEY 0	7.15	6.81
NOV+FEB	7.82	7.68
OATS 0	7.49	7.22
NOV+FEB	7.84	8.06

N TIME	14 MAR	10 APR
PREVCROP E FUNG		
BARLEY NONE	7.42	7.01
TFSD	7.54	7.48
OATS NONE	7.75	7.53
TFSD	7.58	7.75

N TIME	14 MAR	10 APR
WINTER N E FUNG		
0 NONE	7.29	6.82
TFSD	7.35	7.21
NOV+FEB NONE	7.89	7.73
TFSD	7.77	8.02

N TIME	14 MAR	10 APR
PREVCROP L FUNG		
BARLEY NONE	7.04	6.83
SPRAYS	7.92	7.66
OATS NONE	7.13	7.41
SPRAYS	8.21	7.88

N TIME	14 MAR	10 APR
WINTER N L FUNG		
0 NONE	7.00	6.79
SPRAYS	7.64	7.24
NOV+FEB NONE	7.17	7.44
SPRAYS	8.49	8.30

N TIME	14 MAR	10 APR
E FUNG L FUNG		
NONE NONE	7.19	6.79
SPRAYS	7.99	7.75
TFSD NONE	6.98	7.44
SPRAYS	8.14	7.79

N TIME	14 MAR	10 APR
PREVCROP SPRING N		
BARLEY 85	7.13	7.10
160	7.84	7.40
OATS 85	7.46	7.50
160	7.88	7.78

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GRAIN TONNES/HECTARE

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

WINTER N	N TIME SPRING N	14 MAR	10 APR
0	85	6.98	6.81
	160	7.66	7.22
NOV+FEB	85	7.61	7.79
	160	8.05	7.96

E FUNG	N TIME SPRING N	14 MAR	10 APR
NONE	85	7.29	7.16
	160	7.89	7.38
TFSD	85	7.30	7.44
	160	7.83	7.80

L FUNG	N TIME SPRING N	14 MAR	10 APR
NONE	85	6.87	6.90
	160	7.30	7.33
SPRAYS	85	7.71	7.70
	160	8.42	7.84

WINTR NV SOWDATEV	0	20+25	Mean
20 SEPT	6.31	6.29	6.30
17 OCT	6.39	6.66	6.53
Mean	6.35	6.48	6.41

E FUNGV SOWDATEV	NONE	TFSD	Mean
20 SEPT	6.19	6.41	6.30
17 OCT	6.41	6.65	6.53
Mean	6.30	6.53	6.41

E FUNGV WINTR NV	NONE	TFSD	Mean
0	6.21	6.50	6.35
20+25	6.39	6.57	6.48
Mean	6.30	6.53	6.41

N TIMEV SOWDATEV	14 MAR	10 APR	Mean
20 SEPT	6.43	6.18	6.30
17 OCT	6.52	6.54	6.53
Mean	6.47	6.36	6.41

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GRAIN TONNES/HECTARE

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

N TIMEV / WINTR NV	14 MAR	10 APR	Mean
0	6.51	6.20	6.35
20+25	6.44	6.52	6.48
Mean	6.47	6.36	6.41

N TIMEV / E FUNGV	14 MAR	10 APR	Mean
NONE	6.29	6.31	6.30
TFSD	6.66	6.41	6.53
Mean	6.47	6.36	6.41

N TIMEF	14 MAR	10 APR	Mean
	9.04	8.24	8.64

WINTR NX	45+25
	8.69

EXTRA N0	0+0+0
	4.19

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

(not including extra plots)

Margin of two factor tables	0.052
Two factor tables	0.074
Three factor tables	0.105

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

Stratum	d.f.	s.e.	cv%
WP	22	0.210	2.8

GRAIN MEAN DM% 86.3

PLOT AREA HARVESTED 0.00245

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STRAW TONNES/HECTARE

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

WINTER N	0	NOV+FEB	Mean
PREVCROP			
BARLEY	2.85	3.40	3.13
OATS	3.27	3.94	3.60
Mean	3.06	3.67	3.37

E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	2.95	3.30	3.13
OATS	3.57	3.64	3.60
Mean	3.26	3.47	3.37

E FUNG	NONE	TFSD	Mean
WINTER N			
0	2.98	3.15	3.06
NOV+FEB	3.54	3.80	3.67
Mean	3.26	3.47	3.37

L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	2.82	3.43	3.13
OATS	3.33	3.87	3.60
Mean	3.08	3.65	3.37

L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	2.87	3.25	3.06
NOV+FEB	3.28	4.06	3.67
Mean	3.08	3.65	3.37

L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	2.96	3.56	3.26
TFSD	3.20	3.74	3.47
Mean	3.08	3.65	3.37

SPRING N	85	160	Mean
PREVCROP			
BARLEY	2.91	3.34	3.13
OATS	3.40	3.81	3.60
Mean	3.16	3.58	3.37

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STRAW TONNES/HECTARE

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

SPRING N	85	160	Mean
WINTER N			
0	2.85	3.28	3.06
NOV+FEB	3.47	3.87	3.67
Mean	3.16	3.58	3.37

SPRING N	85	160	Mean
E FUNG			
NONE	3.08	3.44	3.26
TFSD	3.23	3.72	3.47
Mean	3.16	3.58	3.37

SPRING N	85	160	Mean
L FUNG			
NONE	2.93	3.23	3.08
SPRAYS	3.38	3.92	3.65
Mean	3.16	3.58	3.37

N TIME	14 MAR	10 APR	Mean
PREVCROP			
BARLEY	3.39	2.87	3.13
OATS	3.74	3.46	3.60
Mean	3.57	3.17	3.37

N TIME	14 MAR	10 APR	Mean
WINTER N			
0	3.27	2.86	3.06
NOV+FEB	3.87	3.47	3.67
Mean	3.57	3.17	3.37

N TIME	14 MAR	10 APR	Mean
E FUNG			
NONE	3.48	3.04	3.26
TFSD	3.66	3.29	3.47
Mean	3.57	3.17	3.37

N TIME	14 MAR	10 APR	Mean
L FUNG			
NONE	3.20	2.96	3.08
SPRAYS	3.93	3.37	3.65
Mean	3.57	3.17	3.37

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STRAW TONNES/HECTARE

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

N TIME	14 MAR	10 APR	Mean
SPRING N			
85	3.31	3.01	3.16
160	3.83	3.32	3.58
Mean	3.57	3.17	3.37

	E FUNG	NONE	TFSD
PREVCROP	WINTER N		
BARLEY	0	2.69	3.02
	NOV+FEB	3.22	3.58
OATS	0	3.27	3.27
	NOV+FEB	3.86	4.01

	L FUNG	NONE	SPRAYS
PREVCROP	WINTER N		
BARLEY	0	2.65	3.05
	NOV+FEB	3.00	3.81
OATS	0	3.10	3.44
	NOV+FEB	3.57	4.30

	L FUNG	NONE	SPRAYS
PREVCROP	E FUNG		
BARLEY	NONE	2.57	3.34
	TFSD	3.08	3.52
OATS	NONE	3.35	3.78
	TFSD	3.32	3.96

	L FUNG	NONE	SPRAYS
WINTER N	E FUNG		
0	NONE	2.86	3.09
	TFSD	2.89	3.40
NOV+FEB	NONE	3.05	4.03
	TFSD	3.51	4.08

	SPRING N	85	160
PREVCROP	WINTER N		
BARLEY	0	2.60	3.10
	NOV+FEB	3.22	3.58
OATS	0	3.09	3.45
	NOV+FEB	3.71	4.16

	SPRING N	85	160
PREVCROP	E FUNG		
BARLEY	NONE	2.63	3.28
	TFSD	3.20	3.41
OATS	NONE	3.54	3.59
	TFSD	3.26	4.02

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STRAW TONNES/HECTARE

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

	SPRING N	85	160
WINTER N	E FUNG		
0	NONE	2.81	3.14
	TFSD	2.88	3.41
NOV+FEB	NONE	3.36	3.73
	TFSD	3.58	4.02

	SPRING N	85	160
PREVCROP	L FUNG		
BARLEY	NONE	2.69	2.96
	SPRAYS	3.14	3.72
OATS	NONE	3.18	3.49
	SPRAYS	3.62	4.12

	SPRING N	85	160
WINTER N	L FUNG		
0	NONE	2.76	2.99
	SPRAYS	2.93	3.56
NOV+FEB	NONE	3.11	3.46
	SPRAYS	3.83	4.28

	SPRING N	85	160
E FUNG	L FUNG		
NONE	NONE	2.84	3.07
	SPRAYS	3.33	3.80
TFSD	NONE	3.02	3.38
	SPRAYS	3.44	4.05

	N TIME	14 MAR	10 APR
PREVCROP	WINTER N		
BARLEY	0	3.13	2.57
	NOV+FEB	3.64	3.16
OATS	0	3.40	3.14
	NOV+FEB	4.09	3.79

	N TIME	14 MAR	10 APR
PREVCROP	E FUNG		
BARLEY	NONE	3.22	2.69
	TFSD	3.56	3.04
OATS	NONE	3.73	3.40
	TFSD	3.75	3.53

	N TIME	14 MAR	10 APR
WINTER N	E FUNG		
0	NONE	3.17	2.79
	TFSD	3.36	2.93
NOV+FEB	NONE	3.78	3.30
	TFSD	3.95	3.65

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STRAW TONNES/HECTARE

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

	N TIME	14 MAR	10 APR
PREVCROP	L FUNG		
BARLEY	NONE	3.07	2.58
	SPRAYS	3.70	3.16
OATS	NONE	3.33	3.34
	SPRAYS	4.16	3.59

	N TIME	14 MAR	10 APR
WINTER N	L FUNG		
0	NONE	3.02	2.73
	SPRAYS	3.52	2.98
NOV+FEB	NONE	3.38	3.18
	SPRAYS	4.35	3.76

	N TIME	14 MAR	10 APR
E FUNG	L FUNG		
NONE	NONE	3.15	2.77
	SPRAYS	3.80	3.32
TFSD	NONE	3.25	3.15
	SPRAYS	4.06	3.42

	N TIME	14 MAR	10 APR
PREVCROP	SPRING N		
BARLEY	85	3.12	2.71
	160	3.66	3.02
OATS	85	3.50	3.30
	160	3.99	3.63

	N TIME	14 MAR	10 APR
WINTER N	SPRING N		
0	85	2.99	2.70
	160	3.54	3.02
NOV+FEB	85	3.62	3.32
	160	4.12	3.63

	N TIME	14 MAR	10 APR
E FUNG	SPRING N		
NONE	85	3.24	2.93
	160	3.71	3.16
TFSD	85	3.37	3.09
	160	3.94	3.49

	N TIME	14 MAR	10 APR
L FUNG	SPRING N		
NONE	85	3.05	2.82
	160	3.36	3.10
SPRAYS	85	3.57	3.20
	160	4.30	3.55

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STRAW TONNES/HECTARE

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

WINTR NV	0	20+25	Mean
SOWDATEV			
20 SEPT	2.87	3.25	3.06
17 OCT	3.37	3.86	3.62
Mean	3.12	3.55	3.34

E FUNGV	NONE	TFSD	Mean
SOWDATEV			
20 SEPT	3.09	3.03	3.06
17 OCT	3.56	3.67	3.62
Mean	3.33	3.35	3.34

E FUNGV	NONE	TFSD	Mean
WINTR NV			
0	3.09	3.15	3.12
20+25	3.56	3.55	3.55
Mean	3.33	3.35	3.34

N TIMEV	14 MAR	10 APR	Mean
SOWDATEV			
20 SEPT	3.41	2.71	3.06
17 OCT	3.71	3.52	3.62
Mean	3.56	3.11	3.34

N TIMEV	14 MAR	10 APR	Mean
WINTR NV			
0	3.44	2.81	3.12
20+25	3.69	3.42	3.55
Mean	3.56	3.11	3.34

N TIMEV	14 MAR	10 APR	Mean
E FUNGV			
NONE	3.58	3.07	3.33
TFSD	3.54	3.16	3.35
Mean	3.56	3.11	3.34

N TIMEF	14 MAR	10 APR	Mean
	4.96	3.94	4.45

WINTR NX	45+25
	4.30

EXTRA N0	0+0+0
	1.25

STRAW MEAN DM% 94.0

PLOT AREA HARVESTED 0.00245

https://doi.org/10.23637/ERADOC-1-40

89/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.J. Gutteridge, J.F. Jenkyn, R.T. Plumb.

Design: 4 randomised blocks of 10 plots.

Whole plot dimensions: 3.0 x 23.0 N.BLOCKS.
3.0 x 18.0 S.BLOCKS.

Treatments: All combinations of:-

1. **SOWDATE** Dates of sowing:

12 SEPT	12 September, 1988
22 SEPT	22 September
3 OCT	3 October
17 OCT	17 October
27 OCT	27 October

2. **APHICIDE** Aphicide:

NONE	None
CYPERMET	Cypermethrin at 0.025 kg in 380 l on 7 Nov, 1988 except on SOWDATE 27 OCT, applied on 11 Jan, 1989

NOTE: All SOWDATE treatments were cultivated by rotary grubber on 12 Sept, 1988 and rotary harrowed on the day of sowing.

Basal applications: Manures: 'Nitram' at 480 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Chlortoluron at 3.5 kg in 200 l. Isoproturon at 1.5 kg with mecoprop at 2.2 kg, ioxynil at 0.28 kg and bromoxynil at 0.28 kg in 200 l. Fungicides: Propiconazole at 0.12 kg with tridemorph at 0.38 kg in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.:- Rotary cultivated: 11 Aug, 1988, and 15 Aug. Glyphosate applied: 6 Sept. Chlortoluron applied: 16 Nov. N applied: 19 Apr, 1989. Remaining weedkillers applied: 2 May. Fungicides applied: 10 May. Combine harvested: 14 July. Previous crops: W. barley 1987 and 1988.

NOTE: Aphids were sampled from late September to June. Visual estimates of BYDV were made throughout the season, a more detailed estimate was made at the end of April. Components of yield were measured. Take-all was assessed in summer.

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89/R/B/2

GRAIN TONNES/HECTARE

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

APHICIDE / SOWDATE	NONE	CYPERMET	Mean
12 SEPT	3.22	3.79	3.50
22 SEPT	3.54	4.26	3.90
3 OCT	3.49	3.75	3.62
17 OCT	2.92	3.37	3.14
27 OCT	3.42	3.68	3.55
Mean	3.32	3.77	3.54

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

SOWDATE	APHICIDE	SOWDATE APHICIDE
0.166	0.105	0.235

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.332	9.4

GRAIN MEAN DM% 85.0

PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-40

89/R/B/3

WINTER BARLEY

VARIETIES

Object: To study the yields of some of the newer winter barley varieties and to compare them with a standard and a naked oat - Great Knott I.

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

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

VARIETY	Varieties and crops:
HALCYO B	Halcyon, barley
IGRI B	Igri, barley
MAGIE B	Magie, barley (duplicated)
MG S600 B	Magie with 'Seamac 600' spray
MARINKA B	Marinka, barley
VIXEN B	Vixen, barley
IMAGE SO	Image, standard oat
KYNON NO	Kynon, naked oat

NOTE: The 'Seamac 600' was applied at 5.6 l in 220 l on 28 Apr, 1989.

Basal applications: Manures: Magnesian limestone at 5.0 t. 'Nitram' at 360 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Isoproturon at 2.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.20 kg in 200 l. Growth regulators: 2-chloroethylphosphonic acid at 0.31 kg and mepiquat chloride at 0.61 kg with a wetting agent ('Citowett' at 0.08 l) in 200 l.

Seed: Barley varieties sown at 150 kg.
Oat varieties sown at 190 kg.

Cultivations, etc.:- Magnesian limestone applied: 6 Sept, 1988. Rotary cultivated: 14 Sept. Glyphosate applied: 19 Oct. Heavy spring-tine cultivated: 29 Oct. Rotary harrowed, seed sown: 2 Nov. Isoproturon applied: 16 Nov. N applied, growth regulators with wetting agent applied: 19 Apr, 1989. Metsulfuron-methyl with fluroxypyr applied: 26 Apr. Combine harvested: 21 July (barley), 25 July (oats). Previous crops: S. barley 1987, w. wheat 1988.

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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89/R/B/3

GRAIN TONNES/HECTARE

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

VARIETY	
HALCYO B	5.88
IGRI B	5.06
MAGIE B	5.38
MG S600 B	5.38
MARINKA B	5.47
VIXEN B	2.58
IMAGE SO	3.99
KYNON NO	2.40
Mean	4.61

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

VARIETY	
0.223	min.rep
0.193	max-min

	VARIETY
max-min	MAGIE B v any of the remainder
min.rep	any of the remainder

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	25	0.315	6.8

GRAIN MEAN DM% 83.7

PLOT AREA HARVESTED 0.00204

https://doi.org/10.23637/ERADOC-1-40

89/R/B/4

WINTER BARLEY

VARIETIES AND BYDV

Object: To measure the relative rates of spread of three strains of barley yellow dwarf virus (BYDV) on two varieties of winter barley and to measure their effects on yield - Delafield.

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

Design: 5 randomised blocks of 6 plots split into 4 sub plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments: All combinations of:-

Whole plots

1. **VARIETY** Varieties:

   IGRI
   VIXEN

2. **INS DATE** Insecticide and date of application:

CYPER E	Cypermethrin at 0.02 kg in 260 l on 28 October, 1988
CYPER M	Cypermethrin at 0.02 kg in 260 l on 5 December
PIRIM L	Pirimicarb at 0.14 kg in 200 l on 28 March, 1989

Sub plots

3. **V STRAIN** BYDV strain:

NONE	Uninoculated
MAV	Sitobion (Macrosiphum) avenae virus
PAV	Padi and avenae virus
RPV	Rhopalosiphum padi virus

NOTES: (1) On 3 Oct, 1988, aphids were introduced to the centre of relevant plots to spread the three isolates of BYDV as above.
(2) The aphid species Sitobion avenae was used for MAV, and Rhopalosiphum padi for RPV and PAV.

Basal applications: Manures: Magnesian limestone at 5.0 t. 'Nitram' at 480 kg. Weedkillers: Diquat at 0.60 kg ion with a wetting agent ('Enhance' at 0.50 l) in 520 l. Isoproturon at 2.5 kg with mecoprop at 1.7 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.15 kg in 400 l. Glyphosate at 0.36 kg with a wetting agent, tallow amine ethoxylate at 0.80 kg, in 200 l. Fungicide: Propiconazole at 0.12 kg in 200 l.

Seed: Varieties, sown at 150 kg.

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89/R/B/4

Cultivations, etc.:- Straw chopped: 10 Aug, 1988. Rotary cultivated: 15 Aug. Magnesian limestone applied: 22 Aug. Diquat with wetting agent applied: 9 Sept. Cultivated with rotary grubber twice, rotary harrowed, seed sown: 10 Sept. Isoproturon and mecoprop applied: 3 Nov. N applied: 12 Apr, 1989. Metsulfuron-methyl with fluroxypyr applied: 15 Apr. Fungicide applied: 10 May. Glyphosate with tallow amine ethoxylate applied: 6 July. Combine harvested: 13 July. Previous crops: W. wheat 1987, w. oilseed rape 1988.

NOTE: Aphid survival was monitored for one to two weeks after release. Visual symptoms of BYDV were assessed throughout the season and a more detailed assessment was made in early February.

GRAIN TONNES/HECTARE

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

INS DATE / **VARIETY**	CYPER E	CYPER M	PIRIM L	Mean
IGRI	7.83	7.85	5.63	7.10
VIXEN	8.36	8.11	8.38	8.28
Mean	8.10	7.98	7.00	7.69

V STRAIN / **VARIETY**	NONE	MAV	PAV	RPV	Mean
IGRI	7.28	7.10	7.13	6.92	7.10
VIXEN	8.24	8.43	8.34	8.11	8.28
Mean	7.76	7.76	7.73	7.51	7.69

V STRAIN / **INS DATE**	NONE	MAV	PAV	RPV	Mean
CYPER E	8.32	8.07	8.18	7.81	8.10
CYPER M	7.89	8.13	7.95	7.94	7.98
PIRIM L	7.07	7.09	7.06	6.78	7.00
Mean	7.76	7.76	7.73	7.51	7.69

VARIETY	**V STRAIN** / **INS DATE**	NONE	MAV	PAV	RPV
IGRI	CYPER E	8.02	7.66	7.98	7.68
	CYPER M	7.77	7.82	8.00	7.83
	PIRIM L	6.04	5.81	5.40	5.25
VIXEN	CYPER E	8.62	8.48	8.39	7.95
	CYPER M	8.02	8.44	7.90	8.06
	PIRIM L	8.10	8.38	8.72	8.31

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89/R/B/4

GRAIN TONNES/HECTARE

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

VARIETY	INS DATE	V STRAIN	VARIETY INS DATE
0.144	0.177	0.140	0.250

VARIETY V STRAIN	INS DATE V STRAIN	VARIETY INS DATE V STRAIN
0.224	0.274	0.388

Except when comparing means with the same level(s) of

VARIETY	0.198
INS DATE	0.242
VARIETY.INS DATE	0.343

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	20	0.395	5.1
BLOCK.WP.SP	72	0.542	7.0

GRAIN MEAN DM% 85.8

SUB PLOT AREA HARVESTED 0.00047

https://doi.org/10.23637/ERADOC-1-40

89/R/B/5

WINTER BARLEY

CONTROL OF VOLUNTEERS

Object: To compare methods of volunteer control in winter barley - Black Horse I S.

Sponsors: R. Moffitt, D.G. Christian.

Design: 3 replicates of 6 x 3 criss-cross.

Column plot dimensions: 6.0 x 23.0.

Treatments: All combinations of:-

1. **PRIMCULT** Primary cultivations:

NONE	None until just before sowing
DYNDRIVE	'Bomford Dynadrive'
DISC	Disc
PLOUGH	Plough
ROTAVATE	Rotary cultivate
TINE	Tine

2. **PRSOWCON** Pre-sowing volunteer control:

GLYPHOS	Glyphosate at 0.27 kg in 200 l on 17 Oct, 1988
PARAQUAT	Paraquat at 0.60 kg ion in 200 l on 17 Oct
ROT HARR	Rotary harrow on 18 Oct

NOTES: (1) Primary cultivation treatments were carried out on 13 Sept, 1988.
(2) All plots were disced twice and seed sown on 18 Oct.
(3) The 'Bomford Dynadrive' has a frame similar to a rotary cultivator but it has two rotating shafts containing flat, slightly twisted, spade-shaped tines. The front shaft drives the rear, it is fitted with twice the number of blades and rotates at about one third the speed of the rear shaft.

Basal applications: Manure: 'Nitram' at 420 kg. Weedkillers: Chlortoluron at 3.5 kg in 200 l. Metsulfuron-methyl at 6.0 g in 400 l. Fungicide: Propiconazole at 0.12 kg in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.:- Chlortoluron applied: 22 Oct, 1988. N applied: 12 Apr, 1989. Metsulfuron-methyl applied: 3 May. Fungicide applied: 17 May. Combine harvested: 14 July. Previous crops: W. wheat 1987 and 1988.

NOTES: (1) Volunteer plants were assessed in October after sowing and before crop emergence.
(2) Ears of volunteer plants were counted at anthesis of the sown crop.
(3) Percentage contamination of harvested grain by volunteer grain was measured.

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89/R/B/5

GRAIN TONNES/HECTARE

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

PRSOWCON	GLYPHOS	PARAQUAT	ROT HARR	Mean
PRIMCULT				
NONE	6.05	6.17	5.81	6.01
DYNDRIVE	5.73	5.99	5.98	5.90
DISC	6.18	5.94	6.05	6.06
PLOUGH	5.63	6.00	6.02	5.89
ROTAVATE	6.24	5.71	5.51	5.82
TINE	6.16	5.84	5.91	5.97
Mean	6.00	5.94	5.88	5.94

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

	PRIMCULT	PRSOWCON	PRIMCULT PRSOWCON
	0.223	0.151	0.335
Except when comparing means with the same level(s) of			
PRIMCULT			0.298
PRSOWCON			0.321

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP1	4	0.185	3.1
BLOCK.WP2	10	0.274	4.6
BLOCK.WP1.WP2	20	0.345	5.8

GRAIN MEAN DM% 85.7

SUB PLOT AREA HARVESTED 0.00161

https://doi.org/10.23637/ERADOC-1-40

89/R/B/7

SPRING BARLEY

VARIETIES AND N

Object: To compare the quality, yield and dormancy of two varieties of s. barley at two rates of nitrogen - Bones Close.

Sponsors: D.G. Christian, R. Moffitt.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments: All combinations of:-

Whole plots

1. **VARIETY** Varieties:

   KLAXON
   NATASHA

2. **N** Nitrogen fertilizer (kg N), as 'Nitram' on 29 Mar, 1989:

   100
   140

Basal applications: Weedkillers: Mecoprop at 1.6 kg, bromoxynil at 0.20 kg and ioxynil at 0.20 kg in 200 l.

Seed: Varieties, sown at 160 kg.

Cultivations, etc.:- Ploughed: 17 Nov, 1988. Rotary harrowed: 28 Mar, 1989. Rotary harrowed, seed sown: 29 Mar. Weedkillers applied: 17 May. Combine harvested: 15 Aug. Previous crops: Potatoes 1987, s. barley 1988.

NOTES: (1) Plants were sampled in mid-June and early August to measure total dry matter and N.
(2) From late June until maturity ears were sampled fortnightly from certain plots, to measure grain growth, N content, grain viability and dormancy.
(3) Volunteer plants were assessed in October after sowing and before emergence.
(4) Ears of volunteers were counted at crop anthesis.
(5) Percentage contamination of harvested grain was measured.

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89/R/B/7

GRAIN TONNES/HECTARE

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

	N	100	140	Mean
VARIETY				
KLAXON		3.24	3.16	3.20
NATASHA		3.05	3.14	3.10
Mean		3.15	3.15	3.15

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

VARIETY	N	VARIETY N
0.198	0.198	0.281

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.344	10.9

GRAIN MEAN DM% 81.9

PLOT AREA HARVESTED 0.00204

https://doi.org/10.23637/ERADOC-1-40