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ROTHAMSTED
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Yields of the Field Experiments 1987

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Barley

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87/R/B/1

WINTER BARLEY

FACTORS LIMITING YIELD

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

Sponsors: J.F. Jenkyn, R.J.Gutteridge, R.T. Plumb, D.G. Christian, R.J. Darby, S.H.T. Harper, L.A. Mullen, N. Carter, G.J.S. Ross.

Associate sponsors: B.R. Kerry, W.Day.

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 (18 Sept, 1986) and given cypermethrin at 0.025 kg in 220 l on 31 Oct:

1. PREVCROP Previous cropping:

BARLEY	W. wheat 1984, s. barley 1985, w. barley 1986
OATS	W. wheat 1984, s. barley 1985, w. oats ploughed out and resown to s. oats 1986

2. WINTER N Nitrogen fertilizer in winter (kg N) as prilled urea (46% N):

0	None
26+25	26 on 17 Nov, 1986, 25 on 16 Feb, 1987

3. SPRING N Nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk':

105	
155	

4. N TIME Timing of spring nitrogen application:

16 MARCH	16 March, 1987
13 APRIL	13 April

5. E FUNG Early fungicides:

NONE	None
TFSD	Triadimenol and fuberidazole seed dressing

6. L FUNG Late fungicides:

NONE	None
SPRAYS	Prochloraz at 0.40 kg, carbendazim at 0.15 kg and tridemorph at 0.52 kg in 220 l on 15 Apr, 1987. 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 105 kg N in spring, not given cypermethrin in the autumn:

1. SOWDATEV

18 SEPT	18 September, 1986
17 OCT	17 October

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

0	None
26+25	26 on 17 Nov, 1986, 25 on 16 Feb, 1987

3. E FUNGV Early fungicides:

NONE	None
TFSD	Triadimenol and fuberidazole seed dressing

4. N TIMEV Timing of spring nitrogen application:

16 MARCH	16 March, 1987
13 APRIL	13 April

plus 2 extra treatments following fallow, sown 18 September and given early and late fungicides, cypermethrin, 105 kg spring nitrogen but not given winter nitrogen:

N TIMEF Timing of spring nitrogen application:

16 MARCH	16 March, 1987 (duplicated)
13 APRIL	13 April (duplicated)

plus 1 extra treatment following barley, sown 18 September given early and late fungicides, cypermethrin, 155 kg spring nitrogen in April:

WINTER NX Extra winter nitrogen (kg N):

51+25	51 kg on 17 Nov, 1986, 25 kg on 16 Feb, 1987 (duplicated)
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plus 1 extra treatment following barley, sown 18 September, and given early and late fungicides, cypermethrin but no nitrogen:

EXTRA NO

0+0+0	No nitrogen (duplicated)
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Basal applications: Weedkillers: Paraquat at 0.60 kg ion in 200 l on two occasions. Isoproturon at 2.5 kg, clopyralid at 0.07 kg, bromoxynil at 0.34 kg and mecoprop at 2.5 kg in 200 l. Glyphosate at 1.4 kg in 220 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.:- Paraquat applied: 12 Aug, 1986. Heavy spring-tine cultivated, cultivated by rotary grubber: 18 Aug. Paraquat applied: 10 Sept. SOWDATE 18 SEPT plots spring-tine cultivated, rotary harrowed and seed sown: 18 Sept. SOWDATE 17 OCT plots rotary harrowed and seed sown: 17 Oct. Isoproturon, clopyralid, bromoxynil and mecoprop applied: 16 Apr, 1987. Growth regulators with wetting agent applied: 27 Apr. Glyphosate applied: 30 July. Combine harvested: 6 Aug. Previous crops: S. barley 1985, w. barley, s oats, fallow 1986.

- NOTES: (1) Soil samples were taken to measure nitrate and ammonium contents in September, 1986, November and February, 1987. Crop samples were taken to measure nitrate N concentrations from November to April.
- (2) Plants were sampled in March, April and June, 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	26+25	Mean
PREVCROP			
BARLEY	4.83	5.63	5.23
OATS	6.33	7.07	6.70
Mean	5.58	6.35	5.96
E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	5.21	5.25	5.23
OATS	6.74	6.66	6.70
Mean	5.97	5.95	5.96
E FUNG	NONE	TFSD	Mean
WINTER N			
0	5.58	5.58	5.58
26+25	6.36	6.33	6.35
Mean	5.97	5.95	5.96
L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	4.89	5.57	5.23
OATS	6.21	7.18	6.70
Mean	5.55	6.38	5.96

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GRAIN TONNES/HECTARE

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

L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	5.18	5.98	5.58
26+25	5.92	6.77	6.35
Mean	5.55	6.38	5.96
L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	5.56	6.39	5.97
TFSD	5.55	6.36	5.95
Mean	5.55	6.38	5.96
SPRING N	105	155	Mean
PREVCROP			
BARLEY	5.07	5.39	5.23
OATS	6.47	6.93	6.70
Mean	5.77	6.16	5.96
SPRING N	105	155	Mean
WINTER N			
0	5.30	5.86	5.58
26+25	6.23	6.46	6.35
Mean	5.77	6.16	5.96
SPRING N	105	155	Mean
E FUNG			
NONE	5.81	6.14	5.97
TFSD	5.73	6.18	5.95
Mean	5.77	6.16	5.96
SPRING N	105	155	Mean
L FUNG			
NONE	5.43	5.67	5.55
SPRAYS	6.10	6.65	6.38
Mean	5.77	6.16	5.96
N TIME	16 MARCH	13 APRIL	Mean
PREVCROP			
BARLEY	5.81	4.65	5.23
OATS	6.97	6.43	6.70
Mean	6.39	5.54	5.96

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GRAIN TONNES/HECTARE

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

N TIME	16 MARCH	13 APRIL	Mean
WINTER N			
0	6.16	5.00	5.58
26+25	6.61	6.08	6.35
Mean	6.39	5.54	5.96
N TIME	16 MARCH	13 APRIL	Mean
E FUNG			
NONE	6.38	5.57	5.97
TFSD	6.40	5.51	5.95
Mean	6.39	5.54	5.96
N TIME	16 MARCH	13 APRIL	Mean
L FUNG			
NONE	5.97	5.14	5.55
SPRAYS	6.81	5.95	6.38
Mean	6.39	5.54	5.96
N TIME	16 MARCH	13 APRIL	Mean
SPRING N			
105	6.18	5.36	5.77
155	6.60	5.73	6.16
Mean	6.39	5.54	5.96
	E FUNG	NONE	TFSD
PREVCROP	WINTER N		
BARLEY	0	4.80	4.86
	26+25	5.61	5.65
OATS	0	6.36	6.29
	26+25	7.12	7.02
	L FUNG	NONE	SPRAYS
PREVCROP	WINTER N		
BARLEY	0	4.48	5.18
	26+25	5.30	5.95
OATS	0	5.89	6.77
	26+25	6.54	7.60
	L FUNG	NONE	SPRAYS
PREVCROP	E FUNG		
BARLEY	NONE	4.90	5.51
	TFSD	4.88	5.62
OATS	NONE	6.22	7.27
	TFSD	6.21	7.10

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GRAIN TONNES/HECTARE

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

	L FUNG	NONE	SPRAYS
WINTER N	E FUNG		
0	NONE	5.19	5.98
	TFSD	5.18	5.97
26+25	NONE	5.93	6.80
	TFSD	5.91	6.75
	SPRING N	105	155
PREVCROP	WINTER N		
BARLEY	0	4.57	5.10
	26+25	5.57	5.69
OATS	0	6.04	6.62
	26+25	6.90	7.24
	SPRING N	105	155
PREVCROP	E FUNG		
BARLEY	NONE	5.10	5.31
	TFSD	5.03	5.47
OATS	NONE	6.52	6.96
	TFSD	6.42	6.89
	SPRING N	105	155
WINTER N	E FUNG		
0	NONE	5.35	5.81
	TFSD	5.25	5.90
26+25	NONE	6.27	6.46
	TFSD	6.20	6.46
	SPRING N	105	155
PREVCROP	L FUNG		
BARLEY	NONE	4.80	4.98
	SPRAYS	5.33	5.81
OATS	NONE	6.06	6.37
	SPRAYS	6.88	7.49
	SPRING N	105	155
WINTER N	L FUNG		
0	NONE	5.03	5.34
	SPRAYS	5.57	6.38
26+25	NONE	5.83	6.01
	SPRAYS	6.63	6.92
	SPRING N	105	155
E FUNG	L FUNG		
NONE	NONE	5.46	5.65
	SPRAYS	6.15	6.62
TFSD	NONE	5.40	5.69
	SPRAYS	6.05	6.67

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GRAIN TONNES/HECTARE

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

	N TIME	16 MARCH	13 APRIL
PREVCROP	WINTER N		
BARLEY	0	5.53	4.13
	26+25	6.08	5.17
OATS	0	6.79	5.87
	26+25	7.15	6.99
	N TIME	16 MARCH	13 APRIL
PREVCROP	E FUNG		
BARLEY	NONE	5.74	4.68
	TFSD	5.88	4.63
OATS	NONE	7.02	6.47
	TFSD	6.92	6.39
	N TIME	16 MARCH	13 APRIL
WINTER N	E FUNG		
0	NONE	6.14	5.02
	TFSD	6.18	4.97
26+25	NONE	6.61	6.12
	TFSD	6.62	6.05
	N TIME	16 MARCH	13 APRIL
PREVCROP	L FUNG		
BARLEY	NONE	5.43	4.36
	SPRAYS	6.19	4.95
OATS	NONE	6.51	5.91
	SPRAYS	7.42	6.94
	N TIME	16 MARCH	13 APRIL
WINTER N	L FUNG		
0	NONE	5.79	4.58
	SPRAYS	6.53	5.42
26+25	NONE	6.15	5.70
	SPRAYS	7.08	6.47
	N TIME	16 MARCH	13 APRIL
E FUNG	L FUNG		
NONE	NONE	5.98	5.14
	SPRAYS	6.78	6.00
TFSD	NONE	5.97	5.13
	SPRAYS	6.83	5.89
	N TIME	16 MARCH	13 APRIL
PREVCROP	SPRING N		
BARLEY	105	5.64	4.50
	155	5.98	4.81
OATS	105	6.73	6.21
	155	7.21	6.64

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GRAIN TONNES/HECTARE

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

	N TIME	16 MARCH	13 APRIL
WINTER N	SPRING N		
0	105	5.85	4.75
	155	6.47	5.24
26+25	105	6.51	5.96
	155	6.72	6.21

	N TIME	16 MARCH	13 APRIL
E FUNG	SPRING N		
NONE	105	6.24	5.38
	155	6.52	5.76
TFSD	105	6.13	5.33
	155	6.67	5.69

	N TIME	16 MARCH	13 APRIL
L FUNG	SPRING N		
NONE	105	5.85	5.02
	155	6.09	5.25
SPRAYS	105	6.51	5.69
	155	7.10	6.20

WINTR NV	0	26+25	Mean
SOWDATEV			
18 SEPT	4.70	5.90	5.30
17 OCT	5.25	5.60	5.42
Mean	4.97	5.75	5.36

N TIMEV	16 MARCH	14 APRIL	Mean
SOWDATEV			
18 SEPT	5.90	4.70	5.30
17 OCT	5.85	4.99	5.42
Mean	5.88	4.85	5.36

N TIMEV	16 MARCH	14 APRIL	Mean
WINTR NV			
0	5.63	4.31	4.97
26+25	6.12	5.38	5.75
Mean	5.88	4.85	5.36

E FUNGV	NONE	TFSD	Mean
SOWDATEV			
18 SEPT	5.35	5.24	5.30
17 OCT	5.38	5.47	5.42
Mean	5.37	5.36	5.36

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GRAIN TONNES/HECTARE

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

E FUNGV	NONE	TFSD	Mean
WINTR NV			
0	4.88	5.06	4.97
26+25	5.85	5.65	5.75
Mean	5.37	5.36	5.36
E FUNGV	NONE	TFSD	Mean
N TIMEV			
16 MARCH	5.88	5.88	5.88
14 APRIL	4.86	4.83	4.85
Mean	5.37	5.36	5.36
	N TIMEV	16 MARCH	14 APRIL
SOWDATEV	WINTR NV		
18 SEPT	0	5.34	4.05
	26+25	6.46	5.34
17 OCT	0	5.92	4.58
	26+25	5.79	5.41
	E FUNGV	NONE	TFSD
SOWDATEV	WINTR NV		
18 SEPT	0	4.42	4.97
	26+25	6.29	5.51
17 OCT	0	5.34	5.16
	26+25	5.42	5.78
	E FUNGV	NONE	TFSD
SOWDATEV	N TIMEV		
18 SEPT	16 MARCH	5.99	5.81
	14 APRIL	4.72	4.67
17 OCT	16 MARCH	5.77	5.94
	14 APRIL	4.99	5.00
	E FUNGV	NONE	TFSD
WINTR NV	N TIMEV		
0	16 MARCH	5.55	5.71
	14 APRIL	4.21	4.42
26+25	16 MARCH	6.20	6.04
	14 APRIL	5.50	5.25
	E FUNGV	NONE	TFSD
SOWDATEV	WINTR NV	N TIMEV	
18 SEPT	0	16 MARCH	4.91
		14 APRIL	3.93
	26+25	16 MARCH	7.06
		14 APRIL	5.51
17 OCT	0	16 MARCH	6.19
		14 APRIL	4.49
	26+25	16 MARCH	5.34
		14 APRIL	5.49

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GRAIN TONNES/HECTARE

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

	N TIMEF	16 MARCH	14 APRIL	Mean
		7.34	6.79	7.06
WINTR NX	51+25			
	6.36			
EXTRA NO	0+0+0			
	2.45			

Grand mean 5.83

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

(not including extra plots)

Margin of two factor tables	0.101
Two factor tables	0.143
Three factor tables	0.202

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

Stratum	d.f.	s.e.	cv%
WP	22	0.404	6.8

GRAIN MEAN DM% 85.3

STRAW TONNES/HECTARE

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

WINTER N	0	26+25	Mean
PREVCROP			
BARLEY	2.36	2.73	2.55
OATS	2.72	2.91	2.81
Mean	2.54	2.82	2.68
E FUNG	NONE	TFSD	Mean
PREVCROP			
BARLEY	2.55	2.55	2.55
OATS	2.83	2.79	2.81
Mean	2.69	2.67	2.68
E FUNG	NONE	TFSD	Mean
WINTER N			
0	2.56	2.52	2.54
26+25	2.83	2.81	2.82
Mean	2.69	2.67	2.68

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STRAW TONNES/HECTARE

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

L FUNG	NONE	SPRAYS	Mean
PREVCROP			
BARLEY	2.31	2.79	2.55
OATS	2.41	3.21	2.81
Mean	2.36	3.00	2.68
L FUNG	NONE	SPRAYS	Mean
WINTER N			
0	2.26	2.82	2.54
26+25	2.46	3.18	2.82
Mean	2.36	3.00	2.68
L FUNG	NONE	SPRAYS	Mean
E FUNG			
NONE	2.36	3.03	2.69
TFSD	2.37	2.97	2.67
Mean	2.36	3.00	2.68
SPRING N	105	155	Mean
PREVCROP			
BARLEY	2.48	2.62	2.55
OATS	2.77	2.85	2.81
Mean	2.63	2.73	2.68
SPRING N	105	155	Mean
WINTER N			
0	2.43	2.65	2.54
26+25	2.82	2.81	2.82
Mean	2.63	2.73	2.68
SPRING N	105	155	Mean
E FUNG			
NONE	2.67	2.71	2.69
TFSD	2.58	2.75	2.67
Mean	2.63	2.73	2.68
SPRING N	105	155	Mean
L FUNG			
NONE	2.34	2.38	2.36
SPRAYS	2.91	3.08	3.00
Mean	2.63	2.73	2.68
N TIME	16 MARCH	13 APRIL	Mean
PREVCROP			
BARLEY	2.62	2.48	2.55
OATS	2.75	2.87	2.81
Mean	2.68	2.68	2.68

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STRAW TONNES/HECTARE

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

N TIME	16 MARCH	13 APRIL	Mean
WINTER N			
0	2.61	2.47	2.54
26+25	2.75	2.88	2.82
Mean	2.68	2.68	2.68
N TIME	16 MARCH	13 APRIL	Mean
E FUNG			
NONE	2.69	2.69	2.69
TFSD	2.67	2.66	2.67
Mean	2.68	2.68	2.68
N TIME	16 MARCH	13 APRIL	Mean
L FUNG			
NONE	2.34	2.39	2.36
SPRAYS	3.03	2.97	3.00
Mean	2.68	2.68	2.68
N TIME	16 MARCH	13 APRIL	Mean
SPRING N			
105	2.68	2.57	2.63
155	2.68	2.78	2.73
Mean	2.68	2.68	2.68
PREVCROP	E FUNG	NONE	TFSD
BARLEY	WINTER N		
	0	2.33	2.40
	26+25	2.77	2.69
OATS	0	2.78	2.65
	26+25	2.88	2.93
PREVCROP	L FUNG	NONE	SPRAYS
BARLEY	WINTER N		
	0	2.14	2.59
	26+25	2.49	2.98
OATS	0	2.39	3.05
	26+25	2.44	3.37
PREVCROP	L FUNG	NONE	SPRAYS
BARLEY	E FUNG		
	NONE	2.27	2.83
	TFSD	2.35	2.74
OATS	NONE	2.44	3.23
	TFSD	2.38	3.19
WINTER N	L FUNG	NONE	SPRAYS
0	E FUNG		
	NONE	2.25	2.86
	TFSD	2.27	2.78
26+25	NONE	2.46	3.20
	TFSD	2.46	3.15

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STRAW TONNES/HECTARE

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

	SPRING N	105	155
PREVCROP	WINTER N		
BARLEY	0	2.21	2.52
	26+25	2.75	2.72
OATS	0	2.64	2.79
	26+25	2.90	2.91
	SPRING N	105	155
PREVCROP	E FUNG		
BARLEY	NONE	2.49	2.61
	TFSD	2.47	2.62
OATS	NONE	2.86	2.81
	TFSD	2.69	2.88
	SPRING N	105	155
WINTER N	E FUNG		
0	NONE	2.44	2.67
	TFSD	2.42	2.63
26+25	NONE	2.91	2.75
	TFSD	2.74	2.88
	SPRING N	105	155
PREVCROP	L FUNG		
BARLEY	NONE	2.27	2.35
	SPRAYS	2.69	2.88
OATS	NONE	2.41	2.41
	SPRAYS	3.13	3.29
	SPRING N	105	155
WINTER N	L FUNG		
0	NONE	2.16	2.36
	SPRAYS	2.69	2.94
26+25	NONE	2.52	2.40
	SPRAYS	3.13	3.23
	SPRING N	105	155
E FUNG	L FUNG		
NONE	NONE	2.36	2.35
	SPRAYS	2.98	3.07
TFSD	NONE	2.32	2.41
	SPRAYS	2.84	3.10
	N TIME	16 MARCH	13 APRIL
PREVCROP	WINTER N		
BARLEY	0	2.48	2.25
	26+25	2.76	2.71
OATS	0	2.74	2.69
	26+25	2.75	3.06
	N TIME	16 MARCH	13 APRIL
PREVCROP	E FUNG		
BARLEY	NONE	2.63	2.48
	TFSD	2.61	2.48
OATS	NONE	2.75	2.91
	TFSD	2.74	2.83

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STRAW TONNES/HECTARE

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

	N TIME	16 MARCH	13 APRIL
WINTER N	E FUNG		
0	NONE	2.60	2.51
	TFSD	2.62	2.42
26+25	NONE	2.78	2.88
	TFSD	2.73	2.89
	N TIME	16 MARCH	13 APRIL
PREVCROP	L FUNG		
BARLEY	NONE	2.38	2.24
	SPRAYS	2.85	2.72
OATS	NONE	2.29	2.54
	SPRAYS	3.21	3.21
	N TIME	16 MARCH	13 APRIL
WINTER N	L FUNG		
0	NONE	2.34	2.19
	SPRAYS	2.89	2.75
26+25	NONE	2.34	2.59
	SPRAYS	3.17	3.18
	N TIME	16 MARCH	13 APRIL
E FUNG	L FUNG		
NONE	NONE	2.31	2.40
	SPRAYS	3.07	2.99
TFSD	NONE	2.36	2.37
	SPRAYS	2.99	2.94
	N TIME	16 MARCH	13 APRIL
PREVCROP	SPRING N		
BARLEY	105	2.59	2.37
	155	2.65	2.59
OATS	105	2.78	2.76
	155	2.71	2.98
	N TIME	16 MARCH	13 APRIL
WINTER N	SPRING N		
0	105	2.54	2.32
	155	2.69	2.62
26+25	105	2.83	2.82
	155	2.68	2.95
	N TIME	16 MARCH	13 APRIL
E FUNG	SPRING N		
NONE	105	2.80	2.54
	155	2.58	2.85
TFSD	105	2.56	2.60
	155	2.79	2.72
	N TIME	16 MARCH	13 APRIL
L FUNG	SPRING N		
NONE	105	2.44	2.25
	155	2.23	2.53
SPRAYS	105	2.93	2.89
	155	3.13	3.04

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STRAW TONNES/HECTARE

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

WINTR NV	0	26+25	Mean
SOWDATEV			
18 SEPT	2.45	2.95	2.70
17 OCT	3.15	3.29	3.22
Mean	2.80	3.12	2.96
N TIMEV	16 MARCH	14 APRIL	Mean
SOWDATEV			
18 SEPT	2.99	2.41	2.70
17 OCT	3.45	2.99	3.22
Mean	3.22	2.70	2.96
N TIMEV	16 MARCH	14 APRIL	Mean
WINTR NV			
0	3.13	2.47	2.80
26+25	3.31	2.94	3.12
Mean	3.22	2.70	2.96
E FUNGV	NONE	TFSD	Mean
SOWDATEV			
18 SEPT	2.81	2.59	2.70
17 OCT	3.11	3.34	3.22
Mean	2.96	2.96	2.96
E FUNGV	NONE	TFSD	Mean
WINTR NV			
0	2.71	2.89	2.80
26+25	3.21	3.04	3.12
Mean	2.96	2.96	2.96
E FUNGV	NONE	TFSD	Mean
N TIMEV			
16 MARCH	3.29	3.14	3.22
14 APRIL	2.62	2.79	2.70
Mean	2.96	2.96	2.96
SOWDATEV	N TIMEV	16 MARCH	14 APRIL
18 SEPT	WINTR NV		
	0	2.79	2.10
	26+25	3.18	2.73
17 OCT	0	3.46	2.84
	26+25	3.44	3.15
SOWDATEV	E FUNGV	NONE	TFSD
18 SEPT	WINTR NV		
	0	2.36	2.53
	26+25	3.25	2.66
17 OCT	0	3.05	3.25
	26+25	3.16	3.43

87/R/B/1

STRAW TONNES/HECTARE

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

	E FUNGV	NONE	TFSD
SOWDATEV	N TIMEV		
18 SEPT	16 MARCH	3.21	2.76
	14 APRIL	2.40	2.43
17 OCT	16 MARCH	3.37	3.53
	14 APRIL	2.84	3.14

	E FUNGV	NONE	TFSD
WINTR NV	N TIMEV		
0	16 MARCH	3.10	3.15
	14 APRIL	2.31	2.63
26+25	16 MARCH	3.48	3.14
	14 APRIL	2.93	2.95

	WINTR NV	E FUNGV	NONE	TFSD
SOWDATEV	N TIMEV			
18 SEPT	0	16 MARCH	2.83	2.75
		14 APRIL	1.89	2.31
	26+25	16 MARCH	3.60	2.76
		14 APRIL	2.91	2.55
17 OCT	0	16 MARCH	3.37	3.55
		14 APRIL	2.74	2.94
	26+25	16 MARCH	3.37	3.51
		14 APRIL	2.95	3.34

N TIMEF	16 MARCH	14 APRIL	Mean
	3.37	3.28	3.32

WINTR NX 51+25
3.45

EXTRA NO 0+0+0
0.84

Grand mean 2.74

STRAW MEAN DM% 88.0

PLOT AREA HARVESTED 0.00245

87/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 18.0.

Treatments: All combinations of:-

- | | |
|-------------|---|
| 1. SOWDATE | Dates of sowing: |
| 12 SEPT | 12 September, 1986 |
| 22 SEPT | 22 September |
| 1 OCT | 1 October |
| 10 OCT | 10 October |
| 24 OCT | 24 October |
| 2. APHICIDE | Aphicide: |
| NONE | None |
| CYPERMET | Cypermethrin at 0.025 kg in 380 l on 12 Nov, 1986 |

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 460 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Isoproturon at 2.5 kg with clopyralid at 0.07 kg, bromoxynil at 0.34 kg and mecoprop at 2.5 kg in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l. Triadimenol at 0.12 kg in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.:- Cultivated by rotary grubber: 13 Aug, 1986. Heavy spring-tine cultivated: 28 Aug. Paraquat applied: 10 Sept. Heavy spring-tine cultivated, rotary harrowed: 11 Sept. N applied: 21 Mar, 1987. Remaining weedkillers applied: 16 Apr. Prochloraz and carbendazim applied: 21 Apr. Triadimenol applied: 27 May. Combine harvested: 7 Aug. Previous crops: S. barley 1985, w. barley 1986.

NOTE: Aphids were counted from late September to January 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.

87/R/B/2

GRAIN TONNES/HECTARE

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

APHICIDE	NONE	CYPERMET	Mean
SOWDATE			
12 SEPT	5.28	5.20	5.24
22 SEPT	5.14	5.46	5.30
1 OCT	5.54	5.63	5.58
10 OCT	5.47	5.39	5.43
24 OCT	5.61	5.64	5.63
Mean	5.41	5.46	5.44

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

Table	SOWDATE	APHICIDE	SOWDATE APHICIDE
s.e.d.	0.159	0.101	0.225

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.319	5.9

GRAIN MEAN DM% 86.3

PLOT AREA HARVESTED 0.00230

87/R/B/3

WINTER BARLEY

ANTI-FEEDANTS AND BYDV

Object: To study the effects of insecticides and insect anti-feedants and their interaction with control of autumn volunteers on the incidence of BYDV - Scout N.

Sponsors: D.C. Griffiths, R.T. Plumb.

Design: 3 blocks of 2 whole plots, split into 6 sub-plots.

Whole plot dimensions: 15.0 x 30.0.

Treatments: All combinations of:-

Whole plots

- | | |
|-------------|---|
| 1. VOLNTEER | Control of volunteers prior to sowing: |
| KILLED | Control of all green plant matter |
| PRESENT | Volunteer germination and survival encouraged |

Sub plots

- | | |
|-------------|---|
| 2. SPRY INS | Sprays of insecticides and pheromone derivatives applied electrostatically in 10 l: |
| NONE | None |
| CYP | Cypermethrin at 25 g on 29 Oct, 1986 |
| POLYG R1 | Polygodial, racemic, one spray on 29 Oct |
| POLYG R2 | Polygodial, racemic, two sprays, on 15 Oct and 29 Oct |
| POLYG R3 | Polygodial, racemic, three sprays, on 3 Oct, 15 Oct and 29 Oct |
| POLYG N3 | Polygodial, normal, three sprays, on 3 Oct, 15 Oct and 29 Oct |

NOTE: VOLNTEER KILLED plots were sprayed with paraquat at 0.60 kg ion in 280 l on 9 Sept, 1986.

Basal applications: Manures: (0:18:36) at 690 kg. 'Nitram' at 460 kg. Weedkillers: Isoproturon at 2.5 kg with clopyralid at 0.07 kg, bromoxynil at 0.34 kg and mecoprop at 2.5 kg in 500 l. Fungicides: Carbendazim at 0.15 kg and prochloraz at 0.40 kg in 200 l. Propiconazole at 0.25 kg in 200 l. Desiccant: Diquat at 0.80 kg ion with a wetting agent ('Agral' at 0.20 l) in 200 l.

Seed: Igri, sown at 150 kg.

Cultivations, etc.: - PK applied, cultivated by rotary grubber: 7 Aug, 1986. Spring-tine cultivated: 11 Sept. Rotary harrowed, seed sown: 12 Sept. N applied: 20 Mar, 1987. Weedkillers applied: 15 Apr. Carbendazim and prochloraz applied: 29 Apr. Propiconazole applied: 27 May. Diquat with wetting agent applied: 31 July. Combine harvested: 7 Aug. Previous crops: W. barley 1985 and 1986.

87/R/B/3

NOTES: (1) Aphid counts were made in early November 1986, late November and early April, 1987.
 (2) VOLNTEER PRESENT plots were severely infested with blackgrass.

GRAIN TONNES/HECTARE

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

SPRY INS VOLNTEER	NONE	CYP	POLYG R1	POLYG R2	POLYG R3	POLYG N3	Mean
KILLED	6.96	7.35	7.14	7.24	7.27	7.38	7.22
PRESENT	4.75	4.19	4.71	2.43	5.10	4.25	4.24
Mean	5.85	5.77	5.92	4.83	6.19	5.81	5.73

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

Table	SPRY INS	VOLNTEER*
s.e.d.	0.657	0.930

* Within the same level of VOLNTEER only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	20	1.139	19.9

GRAIN MEAN DM% 85.9

SUB PLOT AREA HARVESTED 0.00163

87/R/B/5

WINTER BARLEY

VARIETIES

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

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

Design: 4 randomised blocks of 11 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

VARIETY	Varieties:
GERBEL	Gerbel
IGRI	Igri
KASKADE	Kaskade
MAGIE	Magie
MG 26+0	Magie with 26 kg extra N applied on 17 Nov, 1986
MG 0+25	Magie with 25 kg extra N applied on 16 Feb, 1987
MG 26+25	Magie with extra N applied on both the above dates
MG S600	Magie with 'Seamac 600' spray
MARINKA	Marinka
PIRATE	Pirate
PLAISANT	Plaisant

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 14 Apr, 1987.

Basal applications: Manures: 'Nitram' at 450 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Isoproturon at 2.5 kg with clopyralid at 0.07 kg, bromoxynil at 0.34 kg and mecoprop at 2.5 kg in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l. Triadimenol at 0.12 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.: - Heavy spring-tine cultivated, disced: 18 Aug, 1986. Paraquat applied: 10 Sept. Rotary harrowed, seed sown: 22 Sept. N applied: 19 Mar, 1987. Remaining weedkillers applied: 16 Apr. Prochloraz and carbendazim applied, growth regulators with the wetting agent applied: 27 Apr. Triadimenol applied: 27 May. Combine harvested: 7 Aug. Previous crops: S. barley 1985, w. barley 1986.

NOTE: Leaf samples were taken for disease assessment in June.

87/R/B/5

GRAIN TONNES/HECTARE

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

VARIETY	
GERBEL	8.32
IGRI	7.29
KASKADE	7.42
MAGIE	7.95
MG 26+0	8.28
MG 0+25	7.72
MG 26+25	8.58
MG S600	7.77
MARINKA	8.19
PIRATE	7.87
PLAISANT	7.69
Mean	7.92

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

Table	VARIETY
s.e.d.	0.197

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.279	3.5
GRAIN MEAN DM%	85.2		
PLOT AREA HARVESTED	0.00204		

87/R/B/6 and 87/W/B/6

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 IV and Woburn (W), Lansome II.

Sponsor: R. Moffitt.

Design: 3 randomised blocks of 2 plots split into 10.

Sub-plot dimensions: (R) 3.0 x 10.0. (W) 4.0 x 9.0.

Treatments: All combinations of:-

Whole plots

1. N		Nitrogen fertilizer:
	(R)	(W)
	125	80
	125+46	120
		125 kg N on 20 Mar, 1987 (R), 80 kg N on 5 May (W)
		125 kg N on 20 Mar plus 46 kg N on 29 Apr (R), 120 kg N on 5 May (W)

Sub plots

2. VARIETY	Varieties:
BLENHEIM	Blenheim
CAMEO	Cameo
CORNICHE	Corniche
DIGGER	Digger
DOUBLET	Doublet
KLAXON	Klaxon
KLAXON B	Klaxon with 'Baytan' seed dressing
NATASHA	Natasha
REGATTA	Regatta
TRIUMPH	Triumph

NOTE: Nitrogen fertilizer was applied as 'Nitram'.

Basal applications:

Highfield IV (R): Weedkillers: Clopyralid at 0.07 kg, bromoxynil at 0.34 kg with mecoprop at 2.5 kg in 200 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

Lansome II (W): Fungicides: Tridemorph at 0.19 kg with propiconazole at 0.12 kg in 200 l. Desiccant: Diquat at 0.60 kg ion applied with a wetting agent ('Agral' at 0.10 l) in 200 l.

Seed: Highfield IV (R), and Lansome II (W): Sown at 160 kg.

Cultivations, etc.:-

Highfield IV (R): Ploughed: 5 Nov, 1986. Spring-tine cultivated, rotary harrowed, seed sown, harrowed: 20 Mar, 1987. Rolled: 21 Mar. Weedkillers applied: 6 May. Fungicide applied: 23 June. Combine harvested: 20 Aug. Previous crops: Potatoes 1985, w. wheat 1986.

87/R/B/6 and 87/W/B/6

Cultivations, etc.:-

Lansome II (W): Deep-tine cultivated: 30 Jan, 1987. Spike harrowed with crumbler attached, seed sown: 30 Mar. Fungicides applied: 3 July. Desiccant applied: 21 Aug. Combine harvested: 10 Sept. Previous crops: W. oats 1985, potatoes 1986.

87/R/B/6 HIGHFIELD IV (R)

GRAIN TONNES/HECTARE

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

	N	125	125+46	Mean
VARIETY				
BLENHEIM		6.20	6.59	6.39
CAMEO		6.99	7.63	7.31
CORNICHE		6.61	6.62	6.62
DIGGER		5.99	7.96	6.97
DOUBLET		6.81	7.52	7.17
KLAXON		6.24	6.55	6.39
KLAXON B		6.10	7.19	6.64
NATASHA		6.67	6.85	6.76
REGATTA		7.55	7.58	7.57
TRIUMPH		5.67	6.67	6.17
Mean		6.48	7.12	6.80

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

Table	VARIETY	N*
s.e.d.	0.270	0.382

* Within the same level of N only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	36	0.467	6.9

GRAIN MEAN DM% 86.7

SUB PLOT AREA HARVESTED 0.00204

87/W/B/6 LANSOME II (W)

GRAIN TONNES/HECTARE

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

	N	80	120	Mean
VARIETY				
BLENHEIM		4.92	4.78	4.85
CAMEO		5.00	4.22	4.61
CORNICHE		5.17	4.63	4.90
DIGGER		5.94	6.68	6.31
DOUBLET		4.85	5.23	5.04
KLAXON		5.39	4.44	4.91
KLAXON B		5.02	4.86	4.94
NATASHA		4.57	4.22	4.39
REGATTA		5.43	5.17	5.30
TRIUMPH		5.26	4.03	4.64
Mean		5.15	4.83	4.99

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

Table	VARIETY	N*
s.e.d.	0.236	0.334

* Within the same level of N only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	36	0.409	8.2
GRAIN MEAN DM%	85.5		
SUB PLOT AREA HARVESTED	0.00247		