

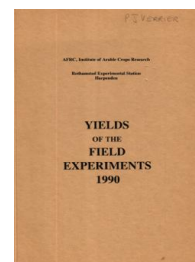
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# Yields of the Field Experiments 1990

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## Barley

### Rothamsted Research

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90/R/B/1

**WINTER BARLEY**

**CONTROL OF VOLUNTEERS**

**Object:** To compare methods of volunteer control in winter barley after w. wheat - Whittlocks.

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

**Design:** 3 replicates of 8 x 3 criss-cross.

**Column plot dimensions:** 6.0 x 20.0.

**Treatments:** All combinations of:-

Column plots

1. <b>PRIMCULT</b>	Primary cultivations:
NONE	None until just before sowing
DYNDRIVE	'Bomford Dynadrive'
PLOUGH	Plough
TINE	Tine

2. <b>CULTDATE</b>	Dates of cultivation:
--------------------	-----------------------

EARLY	17 Aug, 1989
LATER	7 Sept

Row plots

3. <b>PRROWCON</b>	Pre-sowing volunteer control:
GLYPHOS	Glyphosate at 0.27 kg in 200 l on 18 Oct, 1989
PARAQUAT	Paraquat at 0.60 kg ion in 200 l on 18 Oct
NONE	None

**NOTES:** (1) 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.

(2) A 1 m strip of Squarehead's Master, w. wheat, was broadcast on the surface at one end of each plot, at 100 kg, on 17 Aug, 1989 before any primary cultivations.

(3) All plots were heavy spring-tine cultivated on 1 Nov, 1989, then rotary harrowed, the seed was sown and spring-tine cultivated in on 14 Nov.

**Basal applications:** Manure: 'Nitram' at 120 kg and later at 350 kg.  
Weedkiller: Chlorotoluron at 3.5 kg in 200 l.

**Seed:** Magie, sown at 160 kg.

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**Cultivations, etc.:-** Weedkiller applied: 21 Nov, 1989. First N applied: 9 Mar, 1990. Second N applied: 17 Apr. Combine harvested: 24 July. Previous crops: W. oilseed rape 1988, w. wheat 1989.

- NOTES:** (1) Ears of volunteer plants were counted at anthesis of the sown crop.  
 (2) Percentage contamination of harvested grain by volunteer grain was measured.

**GRAIN TONNES/HECTARE**

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

<b>CULTDATE</b>	<b>EARLY</b>	<b>LATER</b>	<b>Mean</b>	
<b>PRIMCULT</b>				
NONE	4.43	4.44	4.44	
DYNDRIVE	4.42	4.56	4.49	
PLOUGH	4.70	4.53	4.61	
TINE	4.65	4.71	4.68	
Mean	4.55	4.56	4.56	
<b>PRROWCON</b>				
	<b>GLYPHOS</b>	<b>PARAQUAT</b>	<b>NONE</b>	<b>Mean</b>
<b>PRIMCULT</b>				
NONE	4.61	4.37	4.33	4.44
DYNDRIVE	4.49	4.64	4.34	4.49
PLOUGH	4.64	4.51	4.69	4.61
TINE	4.65	4.77	4.62	4.68
Mean	4.60	4.57	4.49	4.56
<b>PRROWCON</b>				
	<b>GLYPHOS</b>	<b>PARAQUAT</b>	<b>NONE</b>	<b>Mean</b>
<b>CULTDATE</b>				
EARLY	4.55	4.64	4.46	4.55
LATER	4.64	4.51	4.53	4.56
Mean	4.60	4.57	4.49	4.56
<b>PRIMCULT</b>				
	<b>PRROWCON</b>	<b>GLYPHOS</b>	<b>PARAQUAT</b>	<b>NONE</b>
<b>CULTDATE</b>				
NONE	EARLY	4.49	4.44	4.38
	LATER	4.74	4.30	4.28
DYNDRIVE	EARLY	4.37	4.62	4.28
	LATER	4.60	4.66	4.41
PLOUGH	EARLY	4.62	4.76	4.71
	LATER	4.66	4.26	4.67
TINE	EARLY	4.73	4.75	4.47
	LATER	4.57	4.79	4.77

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GRAIN TONNES/HECTARE

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

	PRIMCULT	CULTDATE	PRSOWCON	PRIMCULT CULTDATE
	0.155	0.110	0.074	0.219
	PRIMCULT PRSOWCON	CULTDATE PRSOWCON	PRIMCULT CULTDATE PRSOWCON	
	0.187	0.136	0.259	
Except when comparing means with the same level(s) of	PRIMCULT			
	0.123			
	CULTDATE	0.093		
	PRSOWCON	0.180	0.127	0.255
	PRIMCULT.CULTDATE			0.167

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP1	4	0.091	2.0
BLOCK.WP2	14	0.268	5.9
BLOCK.WP1.WP2	28	0.196	4.3

GRAIN MEAN DM% 89.6

PLOT AREA HARVESTED 0.00080



90/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 barley yellow dwarf virus (BYDV) on winter barley sown on a range of dates - Highfield IV.

**Sponsors:** G.M. Tatchell, R.T. Plumb.

**Design:** 4 randomised blocks of 10 plots.

**Whole plot dimensions:** 3.0 x 21.0.

**Treatments:** All combinations of:-

1. **SOWDATE**                      Dates of sowing:

5 SEPT	5 September, 1989
18 SEPT	18 September
29 SEPT	29 September
9 OCT	9 October
18 OCT	18 October

2. **APHICIDE**                      Aphicide:

NONE	None
CYPERMET	Cypermethrin at 0.025 kg in 300 l on 6 Nov, 1989

- NOTES:** (1) All **SOWDATE** treatments were heavy spring-tine cultivated on 19 Aug, 1989, rotary cultivated on 22 Aug, rotary harrowed on 5 Sept and rotary harrowed again on the day of sowing.
- (2) **SOWDATE** 5 SEPT and 18 SEPT had fenpropimorph at 0.75 kg in 200 l on 19 Oct, 1989 as well as the basal application on 3 May, 1990.
- (3) The experiment was netted from mid-May to mid-July to prevent damage by birds.

**Basal applications:** Manures: (0:18:36) at 930 kg. 'Nitram' at 460 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Isoproturon at 1.7 kg in 200 l. Bromoxynil at 0.24 kg, clopyralid at 0.05 kg with mecoprop at 2.4 kg applied with the carbendazim and prochloraz in 200 l. Fungicides: Carbendazim at 0.15 kg and prochloraz at 0.40 kg. Fenpropimorph at 0.75 kg in 300 l.

**Seed:** Magie, sown at 160 kg.

**Cultivations, etc.:-** PK applied: 30 Aug, 1989. Glyphosate applied: 4 Sept. Isoproturon applied: 23 Nov. N applied: 22 Mar, 1990. Remaining weedkillers with carbendazim and prochloraz applied: 28 Mar. Fenpropimorph applied: 3 May. Combine harvested: 20 July. Previous crops: W. oats 1988, w. wheat 1989.

- NOTES:** (1) Aphid numbers were sampled from September to May.
- (2) BYDV was assessed by enzyme-linked immunosorbent assay from November to May and by visual symptoms during May.
- (3) Components of yield were measured.

90/R/B/2

GRAIN TONNES/HECTARE

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

APHICIDE	NONE	CYPERMET	Mean
<b>SOWDATE</b>			
5 SEPT	4.42	5.95	5.18
18 SEPT	6.51	7.77	7.14
29 SEPT	7.29	7.75	7.52
9 OCT	7.40	7.69	7.54
18 OCT	7.02	7.42	7.22
Mean	6.53	7.32	6.92

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

SOWDATE	APHICIDE	SOWDATE APHICIDE
0.209	0.132	0.295

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.418	6.0
GRAIN MEAN DM%	90.5		
PLOT AREA HARVESTED	0.00204		

90/R/B/3

SPRING BARLEY

SPRAY TIMINGS AND BYDV

**Object:** To investigate the optimum strategy for controlling barley yellow dwarf virus (BYDV) in spring barley in relation to sowing date, aphid immigration and subsequent population development - Long Hoos I/II.

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

**Design:** 3 randomised blocks of 16 plots.

**Whole plot dimensions:** 3.0 x 10.0.

**Treatments:**

S P DATE	Dates of sowing and of applying pirimicarb, at 0.14 kg in 300 l on each occasion:
E 0	Sown 15 March, 1990 no pirimicarb
E D1	" " " pirimicarb applied 9 Apr
E D2	" " " " " 2 May
E D3	" " " " " 14 May
E D1 D2	" " " " " 9 Apr and 2 May
E D1 D3	" " " " " 9 Apr and 14 May
E D2 D3	" " " " " 2 May and 14 May
E D1D2D3	" " " " " 9 Apr, 2 May and 14 May
L 0	Sown 11 April, no pirimicarb
L D2	" " " pirimicarb applied 2 May
L D3	" " " " " 14 May
L D4	" " " " " 22 May
L D2 D3	" " " " " 2 May and 14 May
L D2 D4	" " " " " 2 May and 22 May
L D3 D4	" " " " " 14 May and 22 May
L D2D3D4	" " " " " 2 May, 14 May and 22 May

**Basal applications:** Manure: 'Nitram' at 350 kg. Weedkillers: Bromoxynil at 0.20 kg, ioxynil at 0.20 kg and mecoprop at 1.6 kg applied with the fungicide in 200 l. Fungicide: Fenpropimorph at 0.75 kg.

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

**Cultivations, etc.:-** Ploughed: 2 Nov, 1989. N applied: 13 Mar, 1990. Spring-tine cultivated: 14 Mar. Early-sown plots rotary harrowed, seed sown: 15 Mar. Late-sown plots rotary harrowed, seed sown: 11 Apr. Weedkillers with the fungicide applied: 14 May. Combine harvested: 14 Aug. Previous crops: S. beans 1988, potatoes 1989.

- NOTES:**
- (1) Aphids were sampled from early April until early July.
  - (2) Shoot samples were taken from some plots to identify and count shoot borers.
  - (3) BYDV was assessed visually on five occasions during May and June and leaves from some plots were tested by enzyme-linked immunosorbent assay to determine virus strains present.
  - (4) Components of yield were measured.

90/R/B/3

GRAIN TONNES/HECTARE

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

S P DATE	
E 0	5.98
E D1	5.82
E D2	5.78
E D3	6.28
E D1 D2	6.16
E D1 D3	6.17
E D2 D3	6.25
E D1D2D3	6.18
L 0	4.51
L D2	4.82
L D3	5.00
L D4	4.99
L D2 D3	4.61
L D2 D4	5.22
L D3 D4	5.07
L D2D3D4	5.37
Mean	5.51

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

S P DATE  
0.401

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.491	8.9
GRAIN MEAN DM%	88.7		
PLOT AREA HARVESTED	0.00204		



90/R/B/4

**SPRING BARLEY**

**VARIETIES AND N**

**Object:** To compare the quality, yield and dormancy of two varieties of s. barley at two rates of nitrogen - Long Hoos I/II.

**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  
TRIUMPH

2. **N** Nitrogen fertilizer (kg N), as 'Nitram' on 8 Mar, 1990:

100  
140

**Basal applications:** Weedkillers: Bromoxynil at 0.20 kg, ioxynil at 0.20 kg and mecoprop at 1.6 kg with the fungicide in 200 l.  
Fungicide: Fenpropimorph at 0.75 kg.

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

**Cultivations, etc.:-** Ploughed: 2 Nov, 1989. Spring-tine cultivated, rotary harrowed, seed sown: 8 Mar, 1990. Weedkillers applied with the fungicide: 14 May. Combine harvested: 14 Aug. Previous crops: S. beans 1988, sunflowers 1989.

**NOTES:** (1) Crop samples were taken from June to maturity to measure shoot numbers, dry weights and nitrogen uptakes.  
(2) Ear samples were taken from June to maturity for measurements of grain growth and assessment of grain dormancy.  
(3) Components of yield were measured at maturity.

90/R/B/4

GRAIN TONNES/HECTARE

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

	N	100	140	Mean
<b>VARIETY</b>				
KLAXON		5.37	5.73	5.55
TRIUMPH		5.24	5.51	5.38
Mean		5.30	5.62	5.46

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

VARIETY	N	VARIETY
		N
0.068	0.068	0.096

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.118	2.2
GRAIN MEAN DM%	88.6		
PLOT AREA HARVESTED	0.00204		