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# Yields of the Field Experiments 1992

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## Winter and Spring Barley

### Rothamsted Research

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92/R/BW/1

WINTER BARLEY

COMPANION CROPPING

**Object:** To measure the effect of companion cropping on pests and diseases, growth, yield and nutrient uptake of cereals - Highfield IV/Road Piece E.

**Sponsor:** D.G. Christian.

**Design:** 3 randomised blocks of 5 plots.

**Whole plot dimensions:** 6.0 x 10.0.

**Treatments:**

<b>COMPCROP</b>	Companion crops sown by broadcasting:
NONE	None
WCLOVER	White clover at 20 kg after previous harvest, subsequently ploughed and w. barley drilled
WMUSTL	White mustard at 1.5 kg before drilling w. barley
WMUSTM	White mustard at 3.0 kg before drilling w. barley
OILRADSH	Oil radish at 1.5 kg before drilling w. barley

**Experimental diary:**

14-Aug-91 : B : PK as (0:16:36) at 1040 kg.  
21-Aug-91 : T : **COMPCROP** WCLOVER: Rotary cultivated with Bomford Dynadrive, New Zealand white clover broadcast at 20 kg.  
09-Sep-91 : B : Ploughed and furrow pressed.  
12-Sep-91 : B : Rolled.  
18-Sep-91 : B : Rotary harrowed.  
18-Sep-91 : T : **COMPCROP** WMUSTL: White mustard (cv. Tilney) broadcast at 1.5 kg.  
                  : T : **COMPCROP** WMUSTM: White mustard (cv. Tilney) broadcast at 3.0 kg.  
                  : T : **COMPCROP** OILRADSH: Oil radish (cv. Trick) broadcast at 1.5 kg.  
18-Sep-91 : B : Rotary harrowed, Magie drilled at 140 kg, rolled.  
06-Mar-92 : B : 34.5% N at 120 kg.  
02-Apr-92 : B : 34.5% N at 340 kg.  
19-Apr-92 : B : Duplosan New System CMPP at 2.0 l and Vindex at 1.4 l in 200 l.  
03-May-92 : B : Calixin at 0.50 l and Radar at 0.50 l in 260 l.  
23-Jul-92 : B : Combine harvested.

Previous crops: W. barley 1990 and 1991.

**NOTES:** (1) Plant samples were taken in December for growth analysis.  
(2) Subsequently in December severe frosts killed all the companion crops.

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GRAIN TONNES/HECTARE

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

COMPCROP	
NONE	4.49
WCLOVER	4.69
WMUSTL	4.71
WMUSTM	4.52
OILRADSH	5.27
Mean	4.73

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

COMPCROP
0.874

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	1.071	22.6

GRAIN MEAN DM% 84.1

PLOT AREA HARVESTED 0.00230

92/R/BW/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:

ERLYSEPT	Early September
MIDSEPT	Mid September
LATESEPT	Late September
ERLYOCT	Early October
MIDOCT	Mid October

2. **APHICIDE**                      Aphicide in autumn:

NONE	None
CYPERMET	Cypermethrin

**Experimental diary:**

05-Aug-91 : B : Straw baled.  
14-Aug-91 : B : PK as (0:16:36) at 1040 kg.  
23-Aug-91 : B : Ploughed.  
26-Aug-91 : B : Rolled.  
02-Sep-91 : T : **SOWDATE** ERLYSEPT: Rotary harrowed, Magie drilled at 140 kg, rolled.  
12-Sep-91 : T : **SOWDATE** MIDSEPT: Rotary harrowed, Magie drilled at 140 kg, rolled.  
19-Sep-91 : T : **SOWDATE** LATESEPT, ERLYOCT, MIDOCT: Heavy spring-tine cultivated.  
26-Sep-91 : T : **SOWDATE** LATESEPT: Rotary harrowed, Magie drilled at 141 kg.  
10-Oct-91 : T : **SOWDATE** ERLYOCT: Rotary harrowed, Magie drilled at 141 kg.  
24-Oct-91 : T : **SOWDATE** MIDOCT: Rotary harrowed, Magie drilled at 141 kg.  
14-Nov-91 : T : **APHICIDE** CYPERMET: Ripcord at 0.25 l in 220 l.  
22-Nov-91 : B : Stefes IPU at 1.0 l and Stomp 400 at 2.5 l in 220 l.  
06-Mar-92 : B : 34.5% N at 120 kg.  
02-Apr-92 : B : 34.5% N at 340 kg.  
19-Apr-92 : B : Duplosan New System CMPP at 2.0 l and Vindex at 1.4 l in 200 l.  
03-May-92 : B : Calixin at 0.50 l and Radar at 0.50 l in 260 l.  
22-May-92 : B : Calirus at 2.0 kg and Calixin at 0.70 l in 200 l.

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**Experimental diary:**

08-Jun-92 : B : Netted yield areas.  
 20-Jul-92 : B : Removed net from yield areas.  
 23-Jul-92 : B : Combine harvested.

Previous crops: W. barley 1990 and 1991.

**NOTES:** (1) Aphid numbers were counted at intervals between crop emergence and the beginning of the stem elongation. Leaf samples were collected for subsequent enzyme-linked immunosorbent assay to determine levels of BYDV infection.  
 (2) Plant height, thousand grain weights and number of grains per ear were determined at harvest.

**GRAIN TONNES/HECTARE**

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

APHICIDE	NONE	CYPERMET	Mean
<b>SOWDATE</b>			
ERLYSEPT	6.59	7.19	6.89
MIDSEPT	7.10	7.34	7.22
LATESEPT	8.36	8.56	8.46
ERLYOCT	8.35	8.58	8.46
MIDDOCT	8.02	7.99	8.00
Mean	7.68	7.93	7.81

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

SOWDATE	APHICIDE	SOWDATE APHICIDE
0.219	0.138	0.309

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.437	5.6

GRAIN MEAN DM% 84.4

PLOT AREA HARVESTED 0.00204 (0.00192 ERLYSEPT only)



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SPRING BARLEY

INSECTICIDES AND APHIDS

**Object:** To compare the effects of a range of insecticides on the control of aphids and barley yellow dwarf virus (BYDV) and on the yield of spring barley - Little Hoos.

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

**Design:** 4 blocks of 5 plots, with external dummy plots and arranged to allow estimation of the effects of neighbouring plots.

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

**Treatments:**

<b>INSECTCDE</b>	Insecticides:
NONE	None
IMIDA SD	Imidacloprid seed dressing
DELTA SP	Deltamethrin spray
DEMET SP	Demeton-S-methyl spray
PIRIM SP	Pirimicarb spray

**NOTE:** Imidacloprid seed dressing applied as a 35% w/v formulation at 300 ml per 100 kg seed.

**Experimental diary:**

30-Aug-91 : B : Straw chopped.  
29-Oct-91 : B : Ploughed.  
22-Apr-92 : B : 34.5% N at 440kg.  
22-Apr-92 : T : Spring-tine cultivated, rotary harrowed. Alexis, dressed Cerevax (except **INSECTCDE** IMADA SD), drilled at 160kg.  
22-Apr-92 : T : **INSECTCDE** IMIDA SD: Spring-tine cultivated, rotary harrowed. Alexis, dressed imidacloprid, drilled at 160 kg.  
22-Apr-92 : B : Rolled.  
19-May-92 : B : Duplosan New System CMPP at 2.0 l, Vindex at 1.0 l and Calixin at 0.70 l in 200 l.  
19-May-92 : T : **INSECTCDE** DELTA SP: Decis at 0.20 l in 220 l.  
: T : **INSECTCDE** DEMET SP: Metasystox 55 at 0.42 l in 220 l.  
: T : **INSECTCDE** PIRIM SP: Aphox at 0.28 kg in 220 l.  
04-Jun-92 : T : **INSECTCDE** DELTA SP: Decis at 0.20 l in 300 l.  
: T : **INSECTCDE** DEMET SP: Metasystox 55 at 0.42 l in 300 l.  
: T : **INSECTCDE** PIRIM SP: Aphox at 0.28 kg in 300 l.  
09-Jun-92 : B : Radar at 0.50 l in 200 l.  
15-Jun-92 : T : **INSECTCDE** DELTA SP: Decis at 0.20 l in 200 l.  
: T : **INSECTCDE** DEMET SP: Metasystox 55 at 0.42 l in 220 l.  
: T : **INSECTCDE** PIRIM SP: Aphox at 0.28 kg in 220 l.  
18-Aug-92 : B : Combine harvested.

Previous crops: W. oilseed rape 1990, w. wheat 1991

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NOTE: Symptoms of BYDV were visually assessed in spring and summer and thousand grain weights measured at harvest.

**GRAIN TONNES/HECTARE**

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

<b>INSCDCDE</b>	
NONE	5.72
IMIDA SD	5.77
DELTA SP	5.81
DEMET SP	5.71
PIRIM SP	5.71
Mean	5.74

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

<b>INSCDCDE</b>
0.076

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.107	1.9
GRAIN MEAN DM%	83.8		
PLOT AREA HARVESTED	0.00230		

92/R/BS/2

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 - Little Hoos.

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

**Design:** 3 randomised blocks of 16 plots with external dummy plots and arranged to allow estimation of the effects of neighbouring plots.

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

**Treatments:**

S P DATE	Dates of sowing and of applying pirimicarb:
E 0	Sown March 1992, no pirimicarb
E D1	" " pirimicarb applied after emergence
E D2	" " " 10 days after emergence
E D3	" " " 20 " " "
E D1 D2	" " " after emergence and 10 days later
E D1 D3	" " " after emergence and 20 days later
E D2 D3	" " " 10 days and 20 days after emergence
E D1D2D3	" " " after emergence, 10 days and 20 days later
L 0	Sown April, no pirimicarb
L D2	" " pirimicarb applied after emergence
L D3	" " " 10 days after emergence
L D4	" " " 20 " " "
L D2 D3	" " " after emergence and 10 days later
L D2 D4	" " " after emergence and 20 days later
L D3 D4	" " " 10 days and 20 days after emergence
L D2D3D4	" " " after emergence, 10 days and 20 days later

**Experimental diary:**

- 30-Aug-91 : B : Straw chopped.
- 30-Oct-91 : B : Ploughed.
- 17-Mar-92 : T : S P DATE E 0, E D1, E D2, E D3, E D1 D2, E D1 D3, E D2 D3, E D1D2D3: Rotary harrowed. Alexis, dressed Cerevax, drilled at 160 kg.
- 19-Mar-92 : B : Rolled.
- 22-Apr-92 : B : 34.5% N at 440 kg.
- 22-Apr-92 : T : S P DATE L 0, L D2, L D3, L D4, L D2 D3, L D2 D4, L D3 D4, L D2D3D4: Spring-tine cultivated, rotary harrowed, Alexis, dressed Cerevax, drilled at 160 kg.



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**Experimental diary:**

24-Apr-92 : B : Rolled.  
05-May-92 : T : S P DATE E D1, E D1 D2, E D1 D3, E D1D2D3: Aphox at  
0.28 kg in 300 l.  
15-May-92 : T : S P DATE E D2, E D1 D2, E D2 D3, E D1D2D3, L D2,  
L D2 D3, L D2 D4, L D2D3D4: Aphox at 0.28 kg in  
300 l.  
19-May-92 : B : Duplosan New System CMPP at 2.0 l, Vindex at 1.0 l and  
Calixin at 0.70 l in 200 l.  
22-May-92 : T : S P DATE E D3, E D1 D3, E D2 D3, E D1D2D3, L D3,  
L D2 D3, L D3 D4, L D2D3D4: Aphox at 0.28 kg in  
300 l.  
04-Jun-92 : T : S P DATE L D4, L D2 D4, L D3 D4, L D2D3D4: Aphox at  
0.28 kg in 300 l.  
09-Jun-92 : B : Radar at 0.50 l in 200 l.  
18-Aug-92 : B : Combine harvested.

Previous crops: W. oilseed rape 1990, w. wheat 1991.

- NOTES:** (1) Plant samples were taken to assess aphid numbers in spring and summer.  
(2) Symptoms of BYDV were visually assessed and leaf samples taken for enzyme-linked immunosorbent assay in spring and summer.  
(3) Number of ears was counted before harvest and thousand grain weights determined at harvest.

92/R/BS/2

GRAIN TONNES/HECTARE

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

S P DATE	
E 0	7.93
E D1	7.89
E D2	8.23
E D3	8.10
E D1 D2	7.89
E D1 D3	8.12
E D2 D3	8.13
E D1D2D3	7.92
L 0	5.50
L D2	5.48
L D3	5.51
L D4	5.42
L D2 D3	5.78
L D2 D4	5.62
L D3 D4	5.62
L D2D3D4	5.72
Mean	6.80

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

S P DATE
0.162

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.198	2.9
GRAIN MEAN DM%	85.0		
PLOT AREA HARVESTED	0.00230		