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# Yields of the Field Experiments 1993



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# Winter and Spring Barley

# **Rothamsted Research**

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## WINTER BARLEY

# COMPANION CROPPING

**Object:** To measure the effect of companion cropping on pests, diseases, growth, yield and nutrient uptake of cereals - Great Harpenden I.

Sponsor: D.G. Christian.

Design: 3 blocks of 8 plots.

Whole plot dimensions: 6.0 x 10.0.

## Treatments:

COMPCROP	Companion crops, broadcast before drilling w. barley:
NONE	None (quadruplicated)
MUST 1.5	White mustard at 1.5 kg
MUST 3.0	White mustard at 3.0 kg
MUST 6.0	White mustard at 6.0 kg
RADISH	Oil radish at 3.0 kg

# Experimental diary:

- 29-Aug-92 : B : Straw baled.
- 16-Sep-92 : B : Scythe at 2.0 1 with Farmon Blue at 0.20 1 in 200 1.
- 21-Sep-92 : B : Ploughed, furrow pressed.
- 28-Sep-92 : B : Rotary harrowed.
- 01-Oct-92 : B : Puffin, dressed Cerevax, drilled at 350 seeds per square metre.
  - : T : COMPCROP MUST 1.5: White mustard (cv. Tilney) broadcast at 1.5 kg.
  - : T : COMPCROP MUST 3.0: White mustard (cv. Tilney) broadcast at 3.0 kg.
  - : T : COMPCROP MUST 6.0: White mustard (cv. Tilney) broadcast at 6.0 kg.
  - : T : COMPCROP RADISH: Oil radish (cv. Trick) broadcast at 3.0 kg.
- 08-Mar-93 : B : 34.5% N at 120 kg.
- 15-Apr-93 : B : Tigress at 2.5 1 in 200 1.
- 21-Apr-93 : B : Ally at 30 g and Starane 2 at 1.0 l in 200 l. 18-May-93 : B : Calirus at 2.0 l and Corbel at 0.50 l in 200 l.
- 02-Aug-93 : B : Combine harvested.

Previous crops: Potatoes 1991, w. wheat 1992.

NOTE: Plant samples were taken in December and April for dry weight, plant population and nitrogen uptake measurements, and in July to measure ear numbers, dry weights, nitrogen uptake and thousand grain weights.

# GRAIN TONNES/HECTARE

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

# COMPCROP

NONE	7.11
MUST 1.5	6.93
MUST 3.0	6.54
MUST 6.0	6.81
RADISH	7.26
Mean	6.99

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

# COMPCROP

0.322 min.rep 0.255 max-min

# COMPCROP

max-min None 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 17 0.395 5.6

GRAIN MEAN DM% 85.2

PLOT AREA HARVESTED 0.00230

# 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 31.0.

Treatments: All combinations of:-

1.	SOWDATE	Dates	of	sowing:

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

2. APHICIDE Aphicide in autumn:

NONE None

CYPERMET Cypermethrin

# Experimental diary:

28-Jul-92 : B : Disced.

19-Aug-92 : B : Sting CT at 1.5 1 in 200 1.

02-Sep-92 : B : Ploughed.

07-Sep-92 : B : Rolled.

08-Sep-92 : T : SOWDATE ERLYSEPT: Rotary harrowed, Magie, dressed Cerevax, drilled at 350 seeds per square metre.

15-Sep-92 : T : SOWDATE MIDSEPT: Rotary harrowed, Magie, dressed

Cerevax, drilled at 350 seeds per square metre.

28-Sep-92 : T : SOWDATE LATESEPT: Rotary harrowed twice, Magie, dressed

Cerevax, drilled at 350 seeds per square metre.

12-Oct-92 : T : SOWDATE ERLYOCT: Rotary harrowed, Magie, dressed Cerevax, drilled at 350 seeds per square metre.

30-Oct-92 : T : SOWDATE LATEOCT: Spring-tine cultivated.

31-Oct-92 : T : SOWDATE LATEOCT: Rotary harrowed, Magie, dressed Cerevax, drilled at 350 seeds per square metre.

20-Nov-92 : T : APHICIDE CYPERMET (except SOWDATE LATEOCT plots):
Ripcord at 250 ml in 220 1.

10-Dec-92 : T : APHICIDE CYPERMET (SOWDATE LATEOCT plots only): Ripcord at 250 ml in 220 1.

05-Mar-93 : B : 34.5% N at 120 kg.

11-Mar-93 : B : Tigress at 2.5 1 in 200 1.

# Experimental diary:

14-Apr-93 : B : 34.5% N at 370 kg.

21-Apr-93 : B : Ally at 30 g and Starane 2 at 1.0 l in 200 l. 18-May-93 : B : Calirus at 2.0 kg and Corbel at 0.50 l in 200 l.

02-Aug-93 : B : Combine harvested.

Previous crops: W. barley 1991 and 1992.

NOTE: Visual assessments were made for BYDV infection from late March to late May and leaf samples taken during March and April for subsequent enzyme-linked immunosorbent assay to determine levels of BYDV infection and isolates present. Numbers of ears, grains per ear and thousand grain weights were measured at harvest.

# GRAIN TONNES/HECTARE

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

APHICIDE	NONE	CYPERMET	Mean
ERLYSEPT	4.98	5.57	5.28
MIDSEPT	5.14	5.53	5.33
LATESEPT	5.90	6.05	5.97
ERLYOCT	5.87	5.82	5.85
LATEOCT	5.67	5.55	5.61
Mean	5.51	5.70	5.61

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

SOWDATE	APHICIDE	SOWDATE
		APHICIDE
0.239	0.151	0.338

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

 Stratum
 d.f.
 s.e.
 cv%

 BLOCK.WP
 27
 0.479
 8.5

GRAIN MEAN DM% 86.0

PLOT AREA HARVESTED 0.00204

# 93/W/BS/1

# SPRING BARLEY

# SULPHUR AND SPRING BARLEY

Object: To measure the uptake of sulphur and effect of fertilizer sulphur on the yield of s. barley on light soil - Woburn, Lansome II.

Sponsors: S.P. McGrath, F. Zhao.

Design: 5 blocks of 2 plots, systematically arranged.

Whole plot dimensions: 5.0 x 10.0.

### Treatments:

SULPHUR	Rates	of	sulphur	(kg	s):
S0	0				
94	40				

**NOTE:** Sulphur was applied as  $K_2SO_4$ , plots not given sulphur were given KC1 to balance the potassium applied.

# Experimental diary:

```
12-Mar-93 : B : Rotary harrowed.

: B : Alexis dressed Cerevax Extra, drilled at 350 seeds per square metre, harrowed.

30-Mar-93 : T : SULPHUR S4: 40 kg S as K<sub>2</sub>SO<sub>4</sub>.

: T : SULPHUR S0: 97.4 kg K as KCl.

: B : 34.5% N at 350 kg.

18-May-93 : B : Deloxil at 1.5 l and Astix at 2.0 l in 200 l.

22-Jun-93 : B : Dorin at 1.0 l in 200 l.

16-Aug-93 : B : Combine harvested.
```

NOTE: Soil samples were taken in autumn and spring for sulphate measurements, plant samples were taken throughout the season to monitor nitrogen and sulphur levels. Grain and straw samples were analysed for N and S concentrations.

# 93/W/BS/1

# GRAIN TONNES/HECTARE

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

SULPHUR

s0 5.82 s4 5.85 S4

Mean 5.83

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

SULPHUR

0.203

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

d.f. Stratum

CV%

BLOCK.WP

4 0.321 5.5

s.e.

GRAIN MEAN DM% 88.9

# STRAW TONNES/HECTARE

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

SULPHUR

5.23 SO

S4 5.33

Mean 5.28

STRAW MEAN DM% 82.7

PLOT AREA HARVESTED 0.00040