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## Yields of the Field Experiments 1994

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### Winter and Spring Barley

#### Rothamsted Research

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94/R/BW/1

WINTER BARLEY

COMPANION CROPPING

**Object:** To measure the effects of white mustard (*Sinapsis alba*) and oil radish (*Raphanus sativus*), grown as companion or cover crops, on the pests, diseases, growth, yield and nutrient uptake of w. barley - West Barnfield II.

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

**Design:** 3 randomised blocks of 6 plots.

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

**Treatments:**

CROP	Crop, seed rate and time of sowing:
-	None
MC	White mustard, broadcast at 20 kg within one week of previous harvest
M1	White mustard, broadcast at 1.5 kg on the same day as drilling barley
M2	White mustard, broadcast at 3.0 kg on the same day as drilling barley
M3	White mustard, broadcast at 6.0 kg on the same day as drilling barley
R1	Oil radish, broadcast at 3.0 kg on the same day as drilling barley

**Experimental diary:**

10-Aug-93 : T : CROP MC: Shallow cultivated twice with Bomford Dynadrive, Thorney white mustard broadcast by hand at 20 kg.  
09-Sep-93 : B : Ploughed.  
22-Sep-93 : B : Rotary harrowed, Puffin, dressed Cerevax Extra, drilled at 350 seeds per m<sup>2</sup>.  
: T : CROP M1, M2, M3: Thorney white mustard broadcast by hand at 1.5 kg, 3.0 and 6.0 kg respectively.  
: T : CROP R1: Trick oil radish broadcast at 3.0 kg.  
28-Oct-93 : B : Draza at 5.5 kg.  
08-Mar-94 : B : 34.5% N at 87 kg.  
14-Apr-94 : B : 34.5% N at 435 kg.  
09-May-94 : B : Starane 2 at 0.75 l with Tigress at 2.5 l in 200 l.  
31-May-94 : B : Mistral at 0.5 l with Radar at 0.5 l in 200 l.  
26-Jul-94 : B : Combine harvested.

Previous crops: W. barley 1992 and 1993.

**NOTES:** (1) Previous w. barley was combine harvested on 3 August, 1993 and the straw was removed on 6 August.  
(2) Plant populations, dry weights and nutrient uptakes of both the w. barley and the cover crops were estimated in January and April.

94/R/BW/1

GRAIN TONNES/HECTARE

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

CROP	
-	7.04
MC	6.55
M1	7.04
M2	6.95
M3	6.48
R1	6.99
Mean	6.84

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

CROP  
0.430

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	10	0.527	7.7

GRAIN MEAN DM% 85.0

PLOT AREA HARVESTED 0.00230

94/R/BS/1

SPRING BARLEY

TRIASULFURON DOSE AND WEED DENSITY

**Object:** To study the effects of suppressed weeds on the growth and yield of s. barley - Webbs.

**Sponsor:** P.J.W. Lutman.

**Design:** 2 randomised blocks of 2 x 5 x 4 plots.

**Whole plot dimensions:** 3.0 x 14.0.

**Treatments:**

1. **WEED SP** Weed species sown:

SM	<i>Stellaria media</i> (chickweed)
SA	<i>Sinapis arvensis</i> (charlock)

2. **WEED DEN** Weed density, plants per m<sup>2</sup>:

	SM	SA
D0	0	0
D1	69	19
D2	125	32
D3	197	71
D4	454	143

3. **HERBICIDE** Rate of triasulfuron, g active ingredient:

H0	None
H1	2.5
H2	5.0
H3	7.5

**NOTE:** Target weed densities, plants per m<sup>2</sup>:

SM: 0, 100, 200, 400 and 800

SA: 0, 50, 100, 200 and 400

**Experimental diary:**

03-Nov-93 : B : Ploughed.  
18-Apr-94 : B : Rotary harrowed.  
: T : **WEED SP**: Weed seeds broadcast by hand.  
: B : Rotary harrowed, Alexis, dressed Panocrine Plus, drilled at 350 seeds per m<sup>2</sup>.  
10-May-94 : B : 34.5% N at 435 kg.  
02-Jun-94 : T : **HERBICIDE** H1: Logran 20 WG at 12.5 g in 220 l.  
: T : **HERBICIDE** H2: Logran 20 WG at 25.0 g in 220 l.  
: T : **HERBICIDE** H3: Logran 20 WG at 37.5 g in 220 l.  
23-Jun-94 : B : Derosal WDG at 312.5 g with Dorin at 1.0 l in 260 l.  
09-Aug-94 : B : Combine harvested.

Previous crops: S. barley 1992 and 1993.

94/R/BS/1

NOTES: (1) Crop and weed dry weights were measured in early and late June and in late July.  
 (2) Yields, cleaned of weed seeds, are presented.

GRAIN TONNES/HECTARE

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

WEED DEN	D0	D1	D2	D3	D4	Mean
WEED SP						
SM	5.35	5.09	5.36	5.03	5.14	5.19
SA	5.24	5.26	4.83	5.12	4.93	5.08
Mean	5.30	5.18	5.10	5.07	5.04	5.14

HERBCIDE	H0	H1	H2	H3	Mean
WEED SP					
SM	4.94	5.25	5.25	5.34	5.19
SA	4.72	5.23	5.23	5.12	5.08
Mean	4.83	5.24	5.24	5.23	5.14

HERBCIDE	H0	H1	H2	H3	Mean
WEED DEN					
D0	5.03	5.45	5.32	5.38	5.30
D1	4.93	5.49	5.01	5.27	5.18
D2	4.86	5.19	5.31	5.03	5.10
D3	4.80	4.94	5.31	5.23	5.07
D4	4.53	5.14	5.25	5.23	5.04
Mean	4.83	5.24	5.24	5.23	5.14

WEED SP	WEED DEN	HERBCIDE	H0	H1	H2	H3
SM	D0		5.14	5.42	5.42	5.42
	D1		4.79	5.34	4.96	5.26
	D2		5.15	5.51	5.46	5.32
	D3		4.69	4.79	5.21	5.41
	D4		4.91	5.19	5.18	5.27
SA	D0		4.92	5.49	5.21	5.34
	D1		5.06	5.63	5.07	5.29
	D2		4.56	4.87	5.16	4.75
	D3		4.92	5.10	5.41	5.05
	D4		4.14	5.09	5.32	5.18

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

WEED SP	WEED DEN	HERBCIDE	WEED SP
			WEED DEN
0.068	0.108	0.097	0.153
WEED SP	WEED DEN	WEED SP	
HERBCIDE	HERBCIDE	WEED DEN	HERBCIDE
0.137	0.216	0.306	

94/R/BS/1

GRAIN TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	39	0.306	6.0

GRAIN MEAN DM% 87.7

PLOT AREA HARVESTED 0.00276

94/W/BS/1

SPRING BARLEY

SULPHUR AND SPRING BARLEY

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

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

**Design:** 5 x 5 Latin square.

**Whole plot dimensions:** 4.8 x 6.0.

**Treatments:**

**SULPHUR** Sulphur fertilizer (kg S), as potassium sulphate:

S0	0
S1	10
S2	20
S3	30
S4	40

**NOTE:** The potassium was balanced by applying potassium chloride to the S0-S3 plots at rates equivalent to the potassium applied to the S4 plots.

**Experimental diary:**

- 09-Feb-94 : B : Ploughed.  
21-Mar-94 : B : Rotary harrowed, Alexis, dressed Panoctine Plus, drilled at 325 seeds per m<sup>2</sup>.  
25-Apr-94 : **T** : **SULPHUR** S1, S2, S3, S4: Potassium sulphate applied at 54.3, 108.7, 163.0 and 217.3 kg respectively.  
          : **T** : **SULPHUR** S0, S1, S2, S3: Potassium chloride applied at 186.3, 139.7, 93.0 and 46.7 kg respectively.  
          : B : 34.5% N at 348 kg.  
19-May-94 : B : Vindex at 1.1 l with Duplosan New System CMPP at 2.0 l in 200 l.  
12-Jun-94 : B : Radar at 0.5 l in 200 l.  
23-Aug-94 : B : Combine harvested.

Previous crops: W. rape 1992, s. barley 1993.

**NOTE:** Samples of plants, grain and straw were taken for chemical analysis, grain quality was assessed and soils were sampled for sulphur content.

94/W/BS/1

GRAIN TONNES/HECTARE

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

SULPHUR	S0	S1	S2	S3	S4	Mean
	4.58	4.82	5.00	4.84	4.55	4.76

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

SULPHUR  
0.169

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

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.266	5.6

GRAIN MEAN DM% 86.6

PLOT AREA HARVESTED 0.00128