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Yields of the Field Experiments 1994

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Beans

Rothamsted Research

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94/R/BEW/2

WINTER BEANS

WEED COMPETITION - BEANS AND WEEDS

Object: To investigate the effects of two weed species on each other and on the growth and yield of winter beans - Pastures.

Sponsors: R.C. Van Acker, P.J.W. Lutman.

Design: 3 randomised blocks of 5 x 5 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments:

1. **BRLY DEN** Number of established barley plants per m²:

B0	0
B1	13
B2	27
B3	81
B4	170

2. **MUST DEN** Number of established white mustard plants per m²:

M0	0
M1	18
M2	38
M3	66
M4	119

NOTES: (1) Target weed densities, number of established plants per m²:

BRLY DEN: 0, 50, 100, 200, 400

MUST DEN: 0, 50, 100, 200, 400

(2) Barley and mustard seeds were sown on restricted areas of each plot as follows:

BRLY DEN central 2m, **MUST DEN** central 2.5m.

Experimental diary:

29-Oct-93 : B : Ploughed, spring-tine cultivated.

01-Nov-93 : B : Rotary harrowed.

02-Nov-93 : B : Rotary harrowed, Punch drilled at 25 seeds per m².

: T : **BRLY DEN** B1, B2, B3, B4: Puffin, dressed Cerevax, broadcast by machine.

05-Nov-93 : B : 34.5% N at 145 kg.

23-Feb-94 : T : **MUST DEN** M1, M2, M3, M4: White mustard seed broadcast by hand.

01-Mar-94 : B : Basagran at 1.5 l in 200 l.

10-Mar-94 : B : Hoegrass at 3.0 l in 200 l.

06-May-94 : B : Bombardier at 1.5 l with Ronilan FL at 0.5 l in 300 l.

23-Aug-94 : B : Hand harvested.

Previous crops: W. rape 1992, w. wheat 1993.

94/R/BEW/2

- NOTES: (1) Chickweed, sown by hand after drilling the w. beans, failed to emerge due to subsequent cold, wet conditions. White mustard was sown instead in late winter.
- (2) Leaf area indices of barley, mustard and beans were measured on two occasions during the growing season. Percentage ground cover was assessed by visual and photographic methods on two occasions early in the growing season. Weed seed yield, as well as crop components of yield, were measured before harvest.

GRAIN TONNES/HECTARE

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

MUST DEN BRLY DEN	M0	M1	M2	M3	M4	Mean
B0	5.23	4.76	4.28	4.20	4.51	4.60
B1	5.03	4.72	4.16	3.92	4.07	4.38
B2	5.48	4.50	3.95	4.06	4.11	4.42
B3	4.35	4.22	4.23	3.81	4.29	4.18
B4	3.93	4.39	4.23	3.97	3.83	4.07
Mean	4.80	4.52	4.17	3.99	4.16	4.33

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

BRLY DEN	MUST DEN	BRLY DEN MUST DEN
0.191	0.191	0.426

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	48	0.522	12.1

GRAIN MEAN DM% *

PLOT AREA HARVESTED 0.00010

94/R/BEW/3

WINTER BEANS

PHEROMONE-BAITED TRAP CROP

Object: To investigate the use of pheromone-baited winter beans as a trap crop for migrants of the pea and bean weevil (*Sitona lineatus*) - Pastures.

Sponsors: L.E. Smart, M.M. Blight, R.T. Glinwood.

Design: 5 x 5 quasi-complete Latin square.

Whole plot dimensions: 6.0 x 6.0.

Treatments:

TREATMNT	Pheromone release and timing of insecticide applications:
-	None
P	Pheromone released, no insecticide
PI-1	Pheromone released, insecticide applied late
PI-2	Pheromone released, insecticide applied early
PI-3	Pheromone released, insecticide applied early and late

Experimental diary:

- 29-Oct-93 : B : Punch broadcast at 25 seeds per m², ploughed, spring-tine cultivated.
- 31-Jan-94 : B : Carbetamex at 3.0 kg in 200 l.
- 21-Apr-94 : T : TREATMNT PI-2, PI-3: Decis at 7.5 g in 200 l.
- 06-May-94 : B : Bombardier at 1.5 l with Ronilan FL at 0.5 l in 300 l.
- 19-May-94 : T : TREATMNT PI-1, PI-3: Decis at 7.5 g in 200 l.
- 18-Aug-94 : T : Combine harvested.

Previous crops: W rape 1992, w.wheat 1993.

- NOTES:** (1) From late February, pheromone was released from a point source, which was hung above the crop at the plot centre.
- (2) Assessments of damage to leaves by adult weevils were made during March and April.

94/R/BEW/3

GRAIN TONNES/HECTARE

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

TREATMNT	
-	3.78
P	4.01
PI-1	4.56
PI-2	4.38
PI-3	4.19
Mean	4.18

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

TREATMNT
0.341

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

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.540	12.9

GRAIN MEAN DM% 85.7

SUB PLOT AREA HARVESTED 0.00138

94/R/BES/2

SPRING BEANS

WEEVILS AND INSECTICIDE

Object: To relate numbers of overwintering *Sitona lineatus* to the most effective timing of insecticide applied to spring beans - Long Hoos V 7 & 8.

Sponsors: L.E. Smart, M.M. Blight, R.T. Glinwood.

Design: 5 x 5 quasi-complete Latin square.

Whole plot dimensions: 6.0 x 6.0.

Treatments:

DELT TIM	Timing of deltamethrin spray application:
NONE	None
EAR+LAT	Early and late
MID	Middle
LATE	Late
ERMIDLAT	Early, middle and late

Experimental diary:

01-Nov-93 : B : Roundup at 3.0 l in 200 l.
18-Nov-93 : B : Ploughed.
10-Mar-94 : B : Heavy spring-tine cultivated, rotary harrowed, Alfred drilled at 60 seeds per m².
11-Mar-94 : B : Opogard 500 SC at 3.4 l in 200 l.
25-Apr-94 : T : **DELT TIM** EAR+LAT, ERMIDLAT: Decis at 7.5 g in 200 l.
06-May-94 : T : **DELT TIM** MID, ERMIDLAT: Decis at 7.5 g in 200 l.
19-May-94 : T : **DELT TIM** EAR+LAT, LATE, ERMIDLAT: Decis at 7.5 g in 200 l.
11-Jul-94 : B : Bravo 500 at 1.0 l with Rovral Flo at 1.5 l and Pirimicarb 50 DG at 280 g in 300 l.
18-Aug-94 : B : Combine harvested.

Previous crops: S. barley 1992, potatoes 1993.

NOTE: Assessments of damage to leaves by adult weevils were made during April and May and the number of larvae in root nodules was assessed at the end of May.

94/R/BES/2

GRAIN TONNES/HECTARE

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

DELT TIM	NONE	EAR+LAT	MID	LATE	ERMIDLAT	Mean
	3.17	3.46	3.14	3.32	3.61	3.34

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

DELT TIM
0.101

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

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.159	4.8

GRAIN MEAN DM% 83.7

PLOT AREA HARVESTED 0.00138

94/R/BES/3

SPRING BEANS

BEAN FLOWER COLOUR AND PHEROMONE

Object: To compare the incidence of *Sitona lineatus* in purple and white flowered beans with and without insecticide and pheromone - Little Hoos.

Sponsors: L.E. Smart, M.M. Blight, R.T. Glinwood.

Design: 6 x 6 quasi-complete Latin square.

Whole plot dimensions: 6.0 x 6.0.

Treatments:

TREATMNT	Variety, insecticide and pheromone:
A-	Alfred
AI	Alfred with insecticide
AP	Alfred with pheromone
C-	Caspar
CI	Caspar with insecticide
CP	Caspar with pheromone

Experimental diary:

29-Nov-93 : B : Deep tine cultivated.
21-Mar-94 : B : Scythe at 2.0 l in 200 l.
26-Mar-94 : B : Oxytril CM at 1.5 l with Starane 2 at 1.0 l in 200 l.
30-Mar-94 : B : Heavy spring-tine cultivated, spring-tine cultivated.
 : T : TREATMNT A-, AI, AP: Alfred drilled at 60 seeds per m².
 : T : TREATMNT C-, CI, CP: Caspar drilled at 60 seeds per m².
12-May-94 : T : TREATMNT AI, CI: Decis at 7.5 g in 200 l.
08-Jul-94 : B : Bombardier at 1.0 l with Rovral Flo at 1.5 l and
 Pirimicarb 50 DG at 0.28 kg in 200 l.
18-Aug-94 : T : Combine harvested.

Previous crops : S. barley 1992, potatoes 1993.

NOTES: (1) From late April, pheromone was released from a point source, which was hung above the crop at the plot centre.
(2) Assessments were made of weevil larval numbers in root nodules at the end of May and of damage to leaves by adult weevils in April and May. Pitfall traps were used to assess weevil populations during the season.

94/R/BES/3

GRAIN TONNES/HECTARE

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

TREATMNT

A-	2.27
AI	2.36
AP	2.11
C-	2.47
CI	2.16
CP	1.71

Mean	2.18
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*** Standard errors of differences of means ***

TREATMNT

0.267

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

Stratum	d.f.	s.e.	cv%
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ROW.COL	20	0.463	21.2
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GRAIN MEAN DM% 80.3

PLOT AREA HARVESTED 0.00276

94/R/BES/4

SPRING BEANS

WEED COMPETITION AND SPRING BEANS

Object: To study the effect of time of emergence on the competition between beans and oats and to correlate assessments of competition and bean yields - Little Hoos.

Sponsor: P.J.W. Lutman.

Design: 3 randomised blocks of 2 x 5 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

1. **SOW DATE** Time of sowing oats:

S2 Same day as beans
S3 Ten days after sowing beans

2. **OAT DEN** Number of established oat plants per m²:

	S2	S3
D0	0	0
D1	23	17
D2	60	53
D3	127	84
D4	192	165

NOTE: Target oat densities, plants per m²: D0 0, D1 40, D2 120, D3 240, D4 480.

Experimental diary:

04-Nov-93 : B : Deep tine cultivated twice.
21-Mar-94 : B : Scythe at 2.0 l in 200 l.
26-Mar-94 : B : Oxytril CM at 1.5 l with Starane 2 at 1.0 l in 200 l.
31-Mar-94 : B : Heavy spring-tine cultivated.
19-Apr-94 : B : Spring-tine cultivated.
20-Apr-94 : B : Rotary harrowed.
 : T : **SOW DATE** S2: Oats broadcast by machine.
 : B : Rotary harrowed, Alfred drilled at 60 seeds per m².
28-Apr-94 : T : **SOW DATE** S3: Oats broadcast by machine.
 : B : Harrowed.
12-May-94 : B : Ripcord at 250 ml in 200 l.
02-Jun-94 : B : Basagran at 3.0 l in 200 l.
08-Jul-94 : B : Bombardier at 1.0 l with Rovral Flo at 1.5 l and
 Pirimicarb 50 DG at 0.28 kg in 200 l.
15-Aug-94 : B : Hand harvested.

Previous crops: S. barley 1992, potatoes 1993.

94/R/BES/4

NOTE: Dry weight, ground cover and leaf area of crop and weed were assessed throughout the summer with the main samples taken in June, July and August.

GRAIN TONNES/HECTARE

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

OAT DEN SOW DATE	D0	D1	D2	D3	D4	Mean
S2	2.42	1.83	1.41	1.03	0.42	1.42
S3	2.19	2.30	1.70	1.48	1.12	1.76
Mean	2.30	2.07	1.55	1.26	0.77	1.59

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

SOW DATE	OAT DEN	SOW DATE OAT DEN
0.150	0.238	0.336

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	18	0.411	25.9
MEAN DM% *			
PLOT AREA HARVESTED	0.00010		