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Yields of the Field Experiments 1993

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Beans

Rothamsted Research

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93/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 - Bylands.

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

Design: 3 blocks of 5 x 5 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments:

1. **BRLY DEN** Barley density (established plants per square metre):

B0	0
B1	13
B2	30
B3	72
B4	154

2. **CHCK DEN** Chickweed density (established plants per square metre):

C0	0
C1	9
C2	40
C3	186
C4	307

NOTES: (1) Target weed densities (established plants per square metre):

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

CHCK DEN: 0, 50, 200, 600, 1200

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

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

Experimental diary:

29-Sep-92 : B : Ploughed.

30-Oct-92 : B : Spring-tine cultivated.

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

: T : **CHCK DEN** C1, C2, C3, C4: Chickweed broadcast by hand.

31-Oct-92 : B : Rotary harrowed, Punch, undressed, drilled at 25 seeds per square metre.

17-Dec-92 : B : Draza at 5.5 kg.

10-Jun-93 : B : Fombardier at 2.0 l and Derosal WDG at 0.62 g in 300 l.

01-Sep-93 : B : Harvested by hand.

Previous crops: W. wheat 1991 and 1992.

93/R/BEW/2

NOTE: Leaf area was measured and ground cover assessed for each species on two occasions. Dry weights of all species and number of bean stems per square metre were determined on four occasions. On the fourth occasion components of yield of both barley and beans were measured.

GRAIN TONNES/HECTARE

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

CHCK DEN BRLY DEN	C0	C1	C2	C3	C4	Mean
B0	5.38	4.92	5.07	5.35	5.19	5.18
B1	5.08	5.08	4.41	5.28	5.13	5.00
B2	4.45	5.30	4.49	4.58	4.39	4.64
B3	4.58	4.95	5.43	4.57	4.91	4.89
B4	4.95	4.95	5.09	4.62	3.68	4.66
Mean	4.89	5.04	4.90	4.88	4.66	4.87

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

BRLY DEN	CHCK DEN	BRLY DEN CHCK DEN
0.169	0.169	0.379

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	48	0.464	9.5

GRAIN MEAN DM% *

PLOT AREA HARVESTED 0.00010

93/R/BES/2

SPRING BEANS

WEEVILS AND INSECTICIDE

Object: To relate numbers of overwintering *Sitona lineatus* to the most effective timing of application of insecticide to spring beans - White Horse II.

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
EARLY	Early
MID	Mid
LATE	Late
EAR+LAT	Early and Late

Experimental diary:

10-Feb-93 : B : Ploughed.
23-Mar-93 : B : Rotary harrowed.
24-Mar-93 : B : Rotary harrowed, Alfred, undressed, drilled at 60 seeds per square metre.
25-Mar-93 : B : Opogard 500 FW at 3.4 l in 200 l.
30-Apr-93 : T : **DELT TIM** EARLY, EAR+LAT: Deltamethrin at 7.5 g in 200 l.
10-May-93 : T : **DELT TIM** MID: Deltamethrin at 7.5 g in 200 l.
18-May-93 : T : **DELT TIM** LATE, EAR+LAT: Deltamethrin at 7.5 g in 200 l.
06-Sep-93 : B : Combine harvested.

Previous crops: Linseed 1991 and 1992.

NOTE: Assessments of adult and larval *Sitona lineatus* population size and feeding damage were made between April and June.

93/R/BES/2

GRAIN TONNES/HECTARE

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

DELT TIM	NONE	EARLY	MID	LATE	EAR+LAT	Mean
	5.12	5.23	5.25	5.45	5.41	5.29

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

DELT TIM
0.172

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

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.272	5.1

GRAIN MEAN DM% 83.3

SUB PLOT AREA HARVESTED 0.00138

93/R/BES/3

SPRING BEANS

PHEROMONE, FUNGAL PATHOGENS AND INSECTICIDE

Object: To test the most effective timing of application of insecticide and fungal pathogen to plots treated with *Sitona lineatus* aggregation pheromone - White Horse II.

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:

CHEMPATH	Pheromone and time of application of fungal pathogen and insecticide:
NONE	None
PHER+BEA	Pheromone plus fungal pathogen early and late
P+D E	Pheromone plus deltamethrin early
P+D E+L	Pheromone plus deltamethrin early and late
PHER	Pheromone alone

- NOTES:** (1) The pheromone was 4-methyl-3,5-heptanedione and was released slowly from a point source at the centre of the plot at approximately 100 µg per day per plot.
(2) The fungal pathogen was spores of *Beauveria bassiana* in surfactant solution. 6 x 10¹⁰ spores in 200 ml were applied to the centre square metre of each plot.

Experimental diary:

- 10-Feb-93 : B : Ploughed.
22-Feb-93 : B : Rotary harrowed.
23-Feb-93 : B : Rotary harrowed, Alfred, undressed, drilled at 60 seeds per square metre.
22-Mar-93 : T : **CHEMPATH:** PHER+BEA, P+D E, P+D E+L, PHER: Pheromone source applied.
08-Apr-93 : T : **CHEMPATH:** P+D E, P+D E+L: Deltamethrin (as Decis) at 7.5 g in 200 l.
14-Apr-93 : T : **CHEMPATH:** PHER+BEA: *Beauveria sp.* spores applied.
30-Apr-93 : T : **CHEMPATH:** P+D E+L: Deltamethrin (as Decis) at 7.5 g in 200 l.
18-May-93 : T : **CHEMPATH:** PHER+BEA: *Beauveria sp.* spores applied.
03-Sep-93 : T : Combine harvested.

Previous crops: Linseed 1991 and 1992.

NOTE: Assessments of adult and larval *Sitona lineatus* population size and feeding damage were made between April and June.

93/R/BES/3

GRAIN TONNES/HECTARE

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

CHEMPATH	NONE	PHER+BEA	P+D E	P+D E+L	PHER	Mean
	4.83	4.74	4.64	4.47	4.83	4.70

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

CHEMPATH
0.140

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

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.221	4.7

GRAIN MEAN DM% 83.3

PLOT AREA HARVESTED 0.00138