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# Yields of the Field Experiments 1981

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## 81/R/BE/8 Electrostatic Spray Study (Biological) - S. Beans

### Rothamsted Research

Rothamsted Research (1982) *81/R/BE/8 Electrostatic Spray Study (Biological) - S. Beans* ; Yields Of The Field Experiments 1981, pp 304 - 305 - DOI: <https://doi.org/10.23637/ERADOC-1-35>

81/R/BE/8

SPRING BEANS

ELECTROSTATIC SPRAY STUDY (BIOLOGICAL)

Object: To study the performance of an electrostatic sprayer on deposition of insecticide, control of pests and on yield of s. beans - Whittlocks.

Sponsors: D.C. Griffiths, A.J. Arnold, G.R. Cayley, P. Etheridge, F.T. Phillips, B.Pye, G.C. Scott.

Design: 3 randomised blocks of 13 plots.

Whole plot dimensions: 3.20 x 24.4.

Treatments: All combinations of:-

- |             |  |
|-------------|--|
| 1. SPR FORM | Sprayer and formulation:                           |
| EST OIL     | Electrostatic sprayer, oil formulation             |
| EST WATR    | Electrostatic sprayer, water formulation           |
| 2. INSCTCDE | Insecticide:                                       |
| DIMETH      | Dimethoate   |
| PERMETH     | Permethrin   |
| 3. INS RATE | Rates of insecticide:                              |
| STANDARD    | Standard rate (500 g dimethoate; 100 g permethrin) |
| HALF        | Half rate (250 g dimethoate; 50 g permethrin)      |

plus five extra treatments:

- |          |   |
|----------|---|
| EXTRA    |   |
| NONE     | Unsprayed   |
| S W DI S | Standard sprayer, water formulation of dimethoate at standard rate                |
| S W PE S | Standard sprayer, water formulation of permethrin at standard rate                |
| M PE O S | Microencapsulated formulation of permethrin at standard rate, particles uncharged |
| M PE C S | Microencapsulated formulation of permethrin at standard rate, particles charged   |

NOTE: Treatments were applied on 14 May, in 3.73 l of oil or water by electrostatic sprayer in 450 l of water by standard sprayer.

Basal applications: Manure: Chalk at 7.5 t. Weedkiller: Simazine at 1.2 l in 250 l. Fungicide: Benomyl at 0.55 kg applied with the insecticide in 250 l. Insecticide: Pirimicarb at 0.14 kg.

Seed: Minden, sown at 260 kg.

Cultivations, etc.: Chalk applied: 2 Sept, 1980. Ploughed: 29 Dec. Spring-tine cultivated twice: 19 Feb, 1981, 20 Feb. Seed sown: 20 Feb. Weedkiller applied: 8 Apr. Insecticide and fungicide applied: 18 June. Combine harvested: 9 Sept. Previous crops: W. wheat 1979, s. barley 1980.

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NOTE: Leaf notching by Sitona was counted, four times in May and early June and suction samples were examined for adult Sitona. The upper leaves of ten plants per plot were removed for laboratory examinations.

GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

INSCTCDE	DIMETH	PERMETH	MEAN
SPR FORM			
EST OIL	2.98	2.92	2.95
EST WATR	3.21	3.31	3.26

MEAN	3.10	3.11	3.10
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INS RATE	STANDARD	HALF	MEAN
SPR FORM			
EST OIL	3.01	2.89	2.95
EST WATR	3.23	3.28	3.26

MEAN	3.12	3.09	3.10
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INS RATE	STANDARD	HALF	MEAN
INSCTCDE			
DIMETH	3.13	3.06	3.10
PERMETH	3.11	3.12	3.11

MEAN	3.12	3.09	3.10
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SPR FORM	INS RATE	STANDARD	HALF
EST OIL	INSCTCDE		
	DIMETH	3.12	2.84
	PERMETH	2.89	2.94
EST WATR	DIMETH	3.14	3.27
	PERMETH	3.33	3.29

EXTRA	NONE	S W DI S	S W PE S	M PE O S	M PE C S	MEAN
GRAND MEAN	2.83	3.02	3.11	2.97	3.14	3.01

\*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

TABLE	EXTRA	SPR FORM	INSCTCDE	INS RATE
SED	0.218	0.109	0.109	0.109

TABLE	SPR FORM	SPR FORM	INSCTCDE	SPR FORM
	INSCTCDE	INS RATE	INS RATE	INSCTCDE
				INS RATE
				& EXTRA
SED	0.514	0.514	0.514	0.218

\*\*\*\*\* STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION \*\*\*\*\*

STRATUM	DF	SE	CV%
BLOCK.WP	24	0.267	8.7
GRAIN MEAN DM%	87.5	PLOT AREA HARVESTED	0.00520