ROTHAMSTED RESEARCH

# Yields of the Field Experiments 1974

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## Beans

*Beans*, Rothamsted Research (1975) Yields Of The Field Experiments 1974, pp 323 - 334 **- DOI: https://doi.org/10.23637/ERADOC-1-119**

74/R/BE/1

SPRING BEANS

VIRUS CONTROL

Object: To study the effects of heat treatment of seed, roguing and control of weevil vectors on yield and incidence of broad bean stain (BBSV) and broad bean true mosaic (BBTMV) viruses in field beans - Whittlocks.

Sponsor: A.J. Cockbain.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 4.27 x 15.2. Area harvested: 0.00488.

| Treatments: Virus control: | VRUSCONT |
|---|---|
| None | 0 |
| Seed heat treated (1 hour at 80°C), crop rogued | HR |
| Seed not heat treated, crop rogued | R |
| Seed heat treated, crop rogued and sprayed with methomyl | HRS |
| Seed not heat treated, crop rogued and sprayed with methomyl | RS |

NOTES: (1) Plants with symptoms of BBSV or BBTMV were removed from R plots on 1, 8, 16, 21 and 31 May, 7, 14 and 20 June.
(2) Methomyl was applied on 15, 30 May, 20 June at 1.0 kg in 500 l.

Basal applications: Manures: (0:14:28) at 400 kg placement drilled. Weedkiller: Simazine at 1.1 kg in 220 l. Insecticide: Demeton-s-methyl at 0.25 kg in 220 l.

Seed: Maris Bead, sown at 220 kg.

Cultivations, etc.:- Deep-tine cultivated: 19 and 20 Sept, 1973. Deep-tine cultivated: 26 Sept. Power harrowed: 27 Mar, 1974. Seed sown and spring-tine cultivated: 28 Mar. Simazine applied: 5 Apr. Insecticide applied: 13 June. Combine harvested: 26 Sept. Previous crops: Winter wheat 1972, barley 1973.

NOTE: Plant counts were made on 9 May. Damage by weevils (Sitona and Apion) was recorded on 9 May. Estimates of virus incidence were made on 7 and 20 June and 5 July. Seed samples were taken at harvest for assessment of virus infection.

Standard error per plot.
Grain, tonnes/hectare: 0.312 or 11.2% (12 d.f.)



*https://doi.org/10.23637/ERADOC-1-119* 

74/R/BE/1

TABLES OF MEANS

GRAIN: TONNES/HECTARE

VRUSCOFF

| 0 | HR | R | HRS | RS | Mean |
|---|---|---|---|---|---|
| 2.59 | 2.48 | 2.60 | 2.91 | 3.37 | 2.79 |

STANDARD ERROR OF DIFFERENCES

VRUSCOFF

0.221

Mean D.M. % 67.1



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74/R/BE/2

SPRING BEANS

INSECTICIDE AND BENEFICIAL INSECTS

Object: To study the effects of a range of rates of dimethoate on beneficial insects, particularly predators and parasites of aphids and the yield of field beans - Whittlocks.

Sponsor: J.H. Stevenson.

Design: 5 randomised blocks of 6 plots.

Whole plot dimensions: 21.3 x 22.9. Area harvested: 0.00439.

Treatments: Rates of dimethoate (g a.i.)

| | DIMETH |
|---|---|
| None | 0 |
| 26 | 26 |
| 52 | 52 |
| 105 | 105 |
| 210 | 210 |
| 420 | 420 |

NOTES: (1) Treatments were applied on 8 July in 390 l.
(2) The application of treatments was deliberately delayed to allow aphid infestations and associated parasites and predators to establish. Weather conditions then delayed spraying until 8 July, by which time aphids had caused appreciable damage to all plots.

Basal applications: Manures: Chalk at 7.5 tonnes. (0:14:28) at 400 kg placement drilled. Weedkillers: Paraquat at 0.56 kg ion in 220 l, and simazine at 1.1 kg in 220 l.

Seed: Minor, sown at 220 kg.

Cultivations, etc.:- Chalk applied: 6 Sept, 1973. Paraquat applied: 24 Oct. Chisel ploughed twice: 6 Dec and 10 Dec. Spring-tine cultivated: 23 Mar, 1974. Rotary harrowed, seed sown and spring-tine cultivated: 27 Mar. Simazine applied: 5 Apr. Combine harvested: 30 Sept. Previous crops: Winter wheat 1972, barley 1973.



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NOTES: (1) Insect populations were sampled by sweep nets and water traps, aphid (Aphis fabae) counts were made.
(2) There was evidence of a linear fertility trend across the site and yields adjusted for trend are presented.

Standard error per plot.
Grain, tonnes/hectare: 0.277 or 15.3% (19 d.f.)

TABLES OF MEANS

GRAIN: TONNES/HECTARE

DIMETH

| 0 | 26 | 52 | 105 | 210 | 420 | Mean |
|---|---|---|---|---|---|---|
| 1.36 | 1.39 | 1.64 | 1.89 | 2.49 | 2.09 | 1.81 |

STANDARD ERROR OF DIFFERENCES

DIMETH

0.176

Mean D.M.% 69.7



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74/R/BE/3

SPRING BEANS

VARIETIES AND VIRUSES

Object: To study the spread and effects on yield of broad bean stain and broad bean true mosaic viruses in different varieties of field bean - Long Hoos I/II.

Sponsor: A.J. Cockbain.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 6.40 x 15.2. Area harvested: 0.00488.

Treatments: Varieties (all healthy seed except where stated):

| | VARIETY |
|---|---|
| Herz Freya | Freya H |
| Maris Bead, seed infected with both viruses, two plots per block | Bead I |
| Maris Bead | Bead H |
| Minden | Minden H |
| Minor | Minor H |

NOTE: Examination of seedlings showed that Herz Freya had 0.01% of plants with virus infection from the seed and Maris Bead, Healthy 0.04%. Maris Bead, Infected had 3.2%. Minden and Minor had none.

Basal applications: Manures: (0:14:28) at 400 kg placement drilled. Weedkiller: Simazine at 1.1 kg in 220 l. Insecticide: Demeton-s-methyl at 0.25 kg in 450 l.

Seed: Sown at 220 kg.

Cultivations, etc.:- Ploughed: 19 Nov, 1973. Spring-tine cultivated: 8 and 9 Mar, 1974. Spring-tine cultivated: 26 Mar. Seed sown and spring-tine cultivated: 28 Mar. Weedkiller applied: 10 Apr. Insecticide applied: 19 June. Combine harvested: 26 Sept.

NOTE: Plant counts were made on 15 May. Seed-borne virus infection was recorded on 9 May and damage by Sitona and Apion weevils on 15 May. Incidence of viruses was assessed on 15 May, 13 June, 2 and 7 July. Estimates of the numbers of adult weevils were made on 13 June. Seed samples were taken at harvest to assess virus infection.

Standard error per plot.
Grain, tonnes/hectare: 0.447 or 12.7% (16 d.f.)



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TABLE OF MEANS

GRAIN: TONNES/HECTARE

VARIETY

| Freya H | Bead I | Bead E | Minden H | Minor H | Mean |
|---|---|---|---|---|---|
| 3.03 | 3.32 | 3.14 | 4.64 | 3.68 | 3.52 |

| STANDARD ERRORS OF DIFFERENCES | VARIETY |
|---|---|
| Bead I v any of remainder | 0.274 |
| Between any of remainder | 0.316 |

Mean D.M. % 72.7



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74/R/BE/4

SPRING BEANS

SYNTHETIC PYRETHROID

Object: To study the effects of the synthetic pyrethroid NRDC 143 on the control of bean weevils and the yield of field beans - Long Hoos I and II.

Sponsor: J.H. Stevenson.

Design: 3 randomised blocks of 3 plots.

Whole plot dimensions: 8.53 x 9.14. Area harvested: 0.00293.

Treatments: Insecticides:

| | INSCTCDE |
|---|---|
| None | None |
| Methomyl at 1.0 kg | Methomyl |
| NRDC 143 at 0.56 kg | NRDC 143 |

NOTE: Treatments were applied on 12 June in 390 l.

Basal applications: Manures: (0:14:28) at 400 kg placement drilled. Weedkiller: Simazine at 1.1 kg in 220 l.

Seed: Minor, sown at 220 kg.

Cultivations, etc.:- Ploughed: 19 Nov, 1973. Spring-tine cultivated twice: 8 and 9 Mar, 1974. Spring-tine cultivated: 26 Mar. Seed sown and spring-tine cultivated: 27 Mar. Weedkiller applied: 10 Apr. Combine harvested: 26 Sept. Previous crops: Winter wheat 1972, barley 1973.

NOTE: Counts were made of weevils (Sitona and Apion) just before spraying and daily for eight days after.

Standard error per plot.
Grain, tonnes/hectare: 0.489 or 15.4% (4 d.f.)



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TABLE OF MEANS

GRAIN: TONNES/HECTARE

| INSECTICIDE | | | |
|---|---|---|---|
| None | Methomyl | NRDC 143 | Mean |
| 1.89 | 3.74 | 3.89 | 3.17 |

STANDARD ERROR OF DIFFERENCES

INSECTICIDE

0.399

Mean D.M. % 75.9



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74/R/BE/6

SPRING BEANS

CONTROL OF WEEVILS

Object: To study the effects of several insecticides on the yield and control of weevils and weevil-transmitted viruses of field beans - Dell Piece.

Sponsors: A.J. Cockbain, P. Etheridge.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 8.53 x 12.2. Area harvested: 0.00390.

Treatments: All combinations of insecticides:

| | | |
|---|---|---|
| 1. | Sprays to foliage | SPRAY |
| | None | None |
| | Fenitrothion at 0.75 kg | Fenitro |
| | Malathion at 1.0 kg | Malathio |
| | Methomyl at 1.0 kg | Methomyl |
| 2. | Granules to foliage | GRANULE |
| | None | None |
| | Phorate at 1.0 kg | Phorate |

NOTE: Sprays, in 500 l, and granules were applied on 15 May, 30 May and 19 June.

Basal applications: Manures: (0:14:28) at 400 kg. Weedkiller: Simazine at 1.1 kg in 220 l. Insecticides: Demeton-s-methyl at 0.25 kg in 220 l.

Seed: Maris Bead, sown at 220 kg.

Cultivations, etc.:- Ploughed: 3 Jan, 1974. Spring-tine cultivated twice: 27 Mar. Rotary harrowed: 1 Apr. Seed sown and spring-tine cultivated: 2 Apr. Simazine applied: 5 Apr. Demeton-s-methyl applied: 13 June. Combine harvested: 26 Sept. Previous crops: Fallow 1972, winter wheat 1973.



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NOTE: Amounts of damage by weevils (Apion and Sitona) were recorded on 9 May and 25 May. Numbers of adults were estimated on 12 June. Incidence of viruses was assessed on 25 April, 12 June, 4 and 23 July and samples of seed were taken at harvest to assess virus infection.

Standard error per plot.
Grain, tonnes/hectare: 0.472 or 12.1% (14 d.f.)

TABLES OF MEANS

GRAIN: TONNES/HECTARE

| | SPRAY | | | | |
|---|---|---|---|---|---|
| | None | Fenitro | Malathio | Methomyl | Mean |
| GRANULE | | | | | |
| None | 3.55 | 3.84 | 4.41 | 3.45 | 3.82 |
| Phorate | 4.42 | 3.58 | 3.89 | 4.10 | 4.00 |
| Mean | 3.98 | 3.71 | 4.15 | 3.78 | 3.91 |

STANDARD ERRORS OF DIFFERENCES

| GRANULE | SPRAY | GRANULE SPRAY |
|---|---|---|
| 0.193 | 0.273 | 0.385 |

Mean D.M.% 65.2



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74/R/BE/7

SPRING BEANS

CONTROL OF STEM EELWORM

Object: To study the effects of a range of rates of aldicarb, applied in the row, on yield and the control of stem eelworm (Ditylenchus dipsaci) in a seed-infested stock of field beans - Garden Plot 7.

Sponsor: D.J. Hooper.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 1.52 x 9.14. Area harvested: 0.00139.

Treatments: Rates of aldicarb (kg):

| | ALDICARB |
|---|---|
| None | 0 |
| 1 | 1 |
| 2 | 2 |
| 4 | 4 |

NOTE: Aldicarb was applied in bands approx. 7.5 cm wide over the seed in rows spaced 50 cm apart.

Basal applications: Manures: (0:20:20) at 1000 kg. Weedkiller: Simazine at 0.84 kg in 340 l. Insecticide: Demeton-s-methyl at 0.25 kg in 340 l.

Seed: Minor, sown at 220 kg.

Cultivations, etc.:- PK applied: 20 Nov, 1973. Ploughed: 11 Dec. Rotary cultivated: 1 Apr, 1974. Seed sown and treatments applied: 2 Apr. Weedkiller applied: 5 Apr. Insecticide applied: 20 June and 19 July. Combine harvested: 30 Sept. Previous crops: Potatoes 1972, fallow 1973.

NOTES: Number of stems infested with stem eelworm were assessed in mid August. Samples of seed were taken at harvest to assess incidence of stem eelworm.

Standard error per plot.
Grain, tonnes/hectare: 0.534 or 11.7% (9 d.f.)



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74/R/BE/7

TABLE OF MEANS

GRAIN: TONNES/HECTARE

ALDICARB

| 0 | 1 | 2 | 4 | Mean |
|---|---|---|---|---|
| 4.52 | 4.48 | 4.53 | 4.68 | 4.55 |

STANDARD ERROR OF DIFFERENCES

ALDICARB

0.377

Mean D.M. % 71.3



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