ROTHAMSTED RESEARCH

Yields of the Field Experiments 1984

Full Table of Content

Field Beans

Rothamsted Research

Rothamsted Research (1985) *Field Beans ;* Yields Of The Field Experiments 1984, pp 280 - 308 **-**
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84/R/BE/1

WINTER BEANS

EFFECTS OF PESTS AND PATHOGENS

Object: To assess the effects of three amounts of pest and disease control on w. beans - Highfield IV.

Sponsors: J. McEwen, R. Bardner, A.J. Cockbain, D.C. Griffiths, D.H. Lapwood, R.M. Webb, D.P. Yeoman.

Design: 6 randomised blocks of 3 plots.

Whole plot dimensions: 5.33 x 15.0.

Treatments:

PATHCONT	Pest and pathogen control (in addition to basals):
STANDARD	None
ENHANCED	Seed dressed with carbendazim and thiram (1.1 g of each per kg of seed)
	Phorate at 1.7 kg as granules to foliage on 12 Apr, 1984
FULL	Seed dressed with carbendazim and thiram
	Aldicarb at 10 kg on 29 Sept, 1983
	Fosetyl-Al at 1.6 kg on 14 Mar, 1984
	Benomyl at 0.56 kg and chlorothalonil at 0.98 kg in 340 l on 4 Apr
	Carbofuran at 1.7 kg on 12 Apr
	Propiconazole at 0.12 kg on 4 July

NOTES: (1) Treatment sprays were applied in 220 l except where stated.
(2) Sides of plots were separated by strips of w. beans 5.33 m wide plus 0.66 m fallow paths, ends of plots were separated by strips of w. beans 9.2 m wide plus 0.9 m fallow paths. The separating crops received basal applications as for the plots.

Basal applications: Weedkillers: Paraquat at 0.42 kg ion in 250 l. Propyzamide at 0.85 kg with simazine at 1.2 l in 250 l. Fungicides: Benomyl at 0.50 kg with chlorothalonil at 1.0 kg and 'Agral', a wetting agent at 0.08 l, in 250 l on the first two occasions and in 200 l on the third occasion.

Seed: Banner, sown at 220 kg.

Cultivations, etc.:- Heavy spring-tine cultivated: 1 Sept, 1983. Chisel ploughed twice: 2 Sept. Paraquat applied: 20 Sept. Heavy spring-tine cultivated: 24 Sept. Aldicarb treatment applied, rotary harrowed, seed sown: 29 Sept. Propyzamide and simazine applied: 30 Sept. Basal fungicides applied: 24 May, 5 June, 26 June, 1984. Combine harvested: 30 Aug. Previous crops: W. wheat 1982, s. barley 1983.

NOTE: Plant counts were made after establishment and components of yield were measured at maturity. Migratory nematodes, root and foliar fungi, aphids and weevils were counted at intervals during the season. Total above-ground dry matter and N content were measured in July. N content of grain was measured.

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84/R/BE/1

GRAIN TONNES/HECTARE

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

PATHCONT	STANDARD	ENHANCED	FULL	MEAN
	4.15	4.34	4.26	4.25

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

TABLE	PATHCONT
SED	0.230

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

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.398	9.4

GRAIN MEAN DM% 85.9

PLOT AREA HARVESTED 0.00320

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84/R/BE/2

WINTER BEANS

SOWING METHODS, DATES AND SEED RATES

Object: To study the effects of drilling or ploughing in seed, on three dates and at three seed rates, on the yield of w. beans - Geescroft.

Sponsors: J. McEwen, D.P. Yeoman, G. Inions.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 6.0 x 10.0.

Treatments: All combinations of:-

1. SOW METH — Methods of sowing:

DRILL	By drill sowing rows 12 cm apart
PLOUGH	Seed broadcast on soil surface and ploughed in

2. SOW DATE — Dates of sowing:

23 SEP	23 September, 1983
19 OCT	19 October
18 NOV	18 November

3. POPULATN — Plant populations per hectare:

	Target Population	Mean population achieved
120	120,000	100,000
240	240,000	170,000
360	360,000	240,000

Basal applications: Weedkillers: Paraquat at 0.42 kg ion in 250 l. Propyzamide at 0.85 kg with simazine at 1.2 l in 250 l. Fungicides: Benomyl at 0.50 kg with chlorothalonil at 1.0 kg and 'Agral', a wetting agent, at 0.08 l, in 250 l on the first two occasions and in 200 l on the third. Insecticides: Permethrin at 0.12 kg in 250 l on the first occasion and 0.05 kg in 500 l on the second.

Seed: Banner, dressed with carbendazim and thiram.

Cultivations, etc.:- Heavy spring-tine cultivated once: 30 Aug, 1983 and twice more: 31 Aug. Chisel ploughed twice: 2 Sept. Paraquat applied: 20 Sept. SOWDATE 23 SEPT plots heavy spring-tine cultivated, spring-tine cultivated, rotary harrowed, seed sown or broadcast, broadcast plots ploughed: 23 Sept. SOWDATE 23 SEPT PLOUGH plots harrowed in: 30 Sept. Propyzamide with simazine applied to SOWDATE 23 SEPT plots: 30 Sept. SOWDATE 19 OCT and SOWDATE 18 NOV plots heavy spring-tine cultivated: 19 Oct. SOWDATE 19 OCT plots rotary harrowed, seed sown or broadcast, broadcast plots ploughed: 19 Oct. SOWDATE 19 OCT PLOUGH plots harrowed in: 21 Oct. Propyzamide with simazine applied to SOWDATE 19 OCT plots: 21 Oct. SOWDATE 18 NOV plots rotary harrowed, seed sown or broadcast, broadcast plots ploughed: 18 Nov. SOWDATE 18 NOV PLOUGH plots harrowed in, propyzamide and simazine applied to SOWDATE 18 NOV plots: 21 Nov. Permethrin applied: 18 Apr, 1984 and 9 May. Benomyl, chlorothalonil and 'Agral' applied: 24 May, 6 June, 26 June. Combine

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84/R/BE/2

harvested: 30 Aug. Previous crops: W. wheat 1982, s. barley 1983.

NOTE: Plant emergence counts were made and numbers of stems assessed in April and at maturity. Flowering dates were recorded. Chocolate spot and lodging were assessed. Components of yield were measured at maturity.

GRAIN TONNES/HECTARE

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

SOW DATE	23 SEP	19 OCT	18 NOV	MEAN
SOW METH				
DRILL	5.07	5.07	4.49	4.88
PLOUGH	5.21	5.25	4.78	5.08
MEAN	5.14	5.16	4.64	4.98

POPULATN	120	240	360	MEAN
SOW METH				
DRILL	4.60	5.04	4.99	4.88
PLOUGH	4.81	5.02	5.41	5.08
MEAN	4.70	5.03	5.20	4.98

POPULATN	120	240	360	MEAN
SOW DATE				
23 SEP	5.57	4.94	4.90	5.14
19 OCT	4.60	5.45	5.44	5.16
18 NOV	3.94	4.71	5.26	4.64
MEAN	4.70	5.03	5.20	4.98

POPULATN		120	240	360
SOW METH	SOW DATE			
DRILL	23 SEP	5.57	5.06	4.58
	19 OCT	4.47	5.50	5.25
	18 NOV	3.75	4.57	5.15
PLOUGH	23 SEP	5.57	4.83	5.22
	19 OCT	4.72	5.40	5.63
	18 NOV	4.13	4.84	5.38

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

TABLE	SOW METH	SOW DATE	POPULATN	SOW METH SOW DATE
SED	0.104	0.127	0.127	0.180

TABLE	SOW METH POPULATN	SOW DATE POPULATN	SOW METH SOW DATE POPULATN
SED	0.180	0.221	0.312

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84/R/BE/2

GRAIN TONNES/HECTARE

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.312	6.3

GRAIN MEAN DM% 85.5

PLOT AREA HARVESTED 0.00305

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84/R/BE/3

WINTER BEANS

CONTROL OF SITONA

Object: To study the effects of six insecticides on the numbers of Sitona and on the yield of w. beans - Road Piece East.

Sponsors: R. Bardner, D.C. Griffiths.

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: 5.33 x 13.7.

Treatments:

INSCTCDE	Forms, rates and methods of applying insecticides:
NONE	None (duplicated)
CF 1 G	Carbofuran at 0.425 kg, as granules, applied on 13 April, 1984
CF 2 G	Carbofuran at 0.850 kg, as granules, applied on 13 April, 1984
CF 4 G	Carbofuran at 1.700 kg, as granules, applied on 13 April, 1984
CY DS	Cyfluthrin at 0.050 kg as a divided spray, half applied on 30 April, half on 23 May, in 200 l
PE DS	Permethrin at 0.050 kg as a divided spray, half applied on 30 April, half on 23 May, in 200 l
PH G	Phorate at 1.700 kg, as granules, applied on 13 April
TR SS	Triazophos at 0.353 kg, as a single spray applied on 30 April in 200 l

Basal applications: Weedkillers: Paraquat at 0.42 kg ion in 250 l. Propyzamide at 0.85 kg with simazine at 1.2 l in 250 l. Fungicides: Benomyl at 0.50 kg with chlorothalonil at 1.0 kg and 'Agral', a wetter, at 0.08 l on two occasions, the first in 250 l, the second in 200 l.

Seed: Banner, dressed thiram and carbendazim, sown at 220 kg.

Cultivations, etc.:- Heavy spring-tine cultivated: 1 Sept, 1983. Chisel ploughed twice: 3 Sept. Paraquat applied: 20 Sept. Heavy spring-tine cultivated: 24 Sept. Seed sown: 29 Sept. Propyzamide and simazine applied: 30 Sept. Fungicides with wetter applied: 5 June, 26 June. Combine harvested: 30 Aug. Previous crops: W. wheat 1982, s. barley 1983.

NOTE: Leaf damage by Sitona was assessed in May, and larval and pupal counts were made in late June. Soil cores were taken at the end of June for assessment of soil animals.

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84/R/BE/3

GRAIN TONNES/HECTARE

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

INSCTCDE	
NONE	4.88
CF 1 G	4.69
CF 2 G	4.81
CF 4 G	5.07
CY DS	4.63
PE DS	5.17
PH G	4.82
TR SS	4.67
MEAN	4.85

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

TABLE	INSCTCDE	
SED	0.197	MIN REP
	0.171	MAX-MIN

	INSCTCDE
MAX-MIN	NONE V ANY OF THE REMAINDER
MIN REP	ANY OF THE REMAINDER

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

STRATUM	DF	SE	CV%
BLOCK.WP	25	0.279	5.7

GRAIN MEAN DM% 85.8

PLOT AREA HARVESTED 0.00293

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84/R/BE/7

WINTER BEANS

VARIETIES

Object: To compare agronomic characters and yields of four varieties of w. beans - Long Hoos V 6.

Sponsors: J. McEwen, D.P. Yeoman.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments:

VARIETY	Varieties:
BANNER	Banner
BEAGLE	Maris Beagle
BULLDOG	Bulldog
THROWS	Throws MS

NOTE: Seed was sown by hand in rows 51 cm apart, seed spaced 5 cm apart in the row.

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Trietazine at 1.2 kg with simazine at 0.17 kg, and paraquat at 0.28 kg ion in 340 l. Fungicides: Benomyl at 0.56 kg on three occasions, the first in 220 l, the second with the permethrin in 220 l and the third with the chlorothalonil in 340 l. Chlorothalonil at 0.98 kg, in 340 l on the first occasion, with the benomyl on the second. Propiconazole at 0.12 kg in 220 l. Insecticide: Permethrin at 0.14 kg with the benomyl.

Cultivations, etc.:- Ploughed: 29 July, 1983. Chalk applied: 25 Aug. Power harrowed, seed sown: 27 Sept. Weedkillers applied: 28 Sept. Benomyl applied: 14 Mar, 1984. Benomyl with permethrin applied: 13 Apr. Chlorothalonil applied: 25 May. Chlorothalonil with benomyl applied: 27 June. Propiconazole applied: 4 July. Harvested by hand: 22 Aug. Previous crops: Potatoes 1982, fallow 1983.

NOTES: (1) Plant counts were made after establishment. Components of yield were measured at maturity. N content of grain was measured.
(2) An examination of the results showed a fertility trend. The yields presented have been adjusted for this trend.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/7

GRAIN TONNES/HECTARE

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

VARIETY	BANNER	BEAGLE	BULLDOG	THROWS	MEAN
	5.35	5.41	4.88	4.60	5.06

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

TABLE	VARIETY
SED	0.144

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

STRATUM	DF	SE	CV%
BLOCK.WP	8	0.201	4.0

GRAIN MEAN DM% 88.5

PLOT AREA HARVESTED 0.00015

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84/R/BE/8

WINTER BEANS

SOWING METHODS AND NEMATODE CONTROL

Object: To study the effects of aldicarb and carbofuran, applied to the seed furrows during sowing behind a plough or behind a rotary harrow, on the control of stem nematode (Ditylenchus dipsaci) and on the yield of w. beans - Highfield 0 & E III.

Sponsor: A.G. Whitehead.

Design: 3 randomised blocks of 16 plots.

Whole plot dimensions: SOW METH DRILL 2.13 x 4.57.
SOW METH PLOUGH 2.74 x 4.57.

Treatments: All combinations of:-

1. SOW METH — Methods of sowing:

   DRILL — By drill sowing rows 30 cm apart
   PLOUGH — From a box attached to the plough, sowing into furrows 30 cm apart

2. NEMACIDE — Nematicides, applied to the seed furrow:

   ALDICARB — Aldicarb
   CARBOFUR — Carbofuran

3. NEM RATE — Rates of nematicides (kg):

   1.25
   2.50
   5.00

plus two extra treatments:

   EXTRA

   DRILL 0 — Sown by drill, no nematicide (duplicated)
   PLOUGH 0 — Sown by plough, no nematicide (duplicated)

Basal applications: Manures: (0:20:20) at 620 kg. Weedkillers: Glyphosate at 1.4 kg in 250 l. Simazine at 1.1 l in 560 l. Fungicide: Benomyl at 0.56 kg on four occasions, in 560 l, 220 l, 280 l and 280 l respectively. Insecticide: Pirimicarb at 0.14 kg on two occasions, in 340 l and 280 l respectively.

Seed: Throws MS, sown at 290 kg.

Cultivations, etc.:- Glyphosate applied: 20 Oct, 1983. Shallow rotary cultivated, PK applied: 25 Oct. Seed sown SOW METH PLOUGH plots, treatments applied: 27 Oct. Rotary harrowed, seed sown SOW METH DRILL plots, treatments applied: 28 Oct. Simazine applied: 20 Feb, 1984. Fungicide applied: 17 Apr, 16 May, 19 June, 2 July. Insecticide applied: 13 June, 18 July. Harvested by hand: 14 Aug. Previous crops: W. beans 1982 and 1983.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/8

NOTE: The percentage of stems infected with stem nematode was assessed in mid-July.

GRAIN TONNES/HECTARE

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

NEMACIDE SOW METH	ALDICARB	CARBOFUR	MEAN
DRILL	3.72	4.80	4.26
PLOUGH	3.03	3.25	3.14
MEAN	3.37	4.02	3.70

NEM RATE SOW METH	1.25	2.50	5.0	MEAN
DRILL	3.85	4.37	4.55	4.26
PLOUGH	3.16	3.15	3.10	3.14
MEAN	3.51	3.76	3.82	3.70

NEM RATE NEMACIDE	1.25	2.50	5.0	MEAN
ALDICARB	3.25	3.35	3.51	3.37
CARBOFUR	3.76	4.17	4.13	4.02
MEAN	3.51	3.76	3.82	3.70

NEMACIDE	ALDICARB			CARBOFUR		
NEM RATE SOW METH	1.25	2.50	5.0	1.25	2.50	5.0
DRILL	3.29	3.55	4.31	4.42	5.18	4.79
PLOUGH	3.21	3.15	2.72	3.11	3.15	3.48

EXTRA	DRILL 0	PLOUGH 0	MEAN
	3.74	2.99	3.37

GRAND MEAN 3.61

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

TABLE	EXTRA	SOW METH	NEMACIDE	NEM RATE
SED	0.369	0.213	0.213	0.261

TABLE	SOW METH NEMACIDE	SOW METH NEM RATE	NEMACIDE NEM RATE	SOW METH NEMACIDE NEM RATE
SED	0.302	0.369	0.369	0.522

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

STRATUM	DF	SE	CV%
BLOCK.WP	32	0.640	17.7

GRAIN MEAN DM% 83.7 PLOT AREA HARVESTED 0.00042

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84/R/BE/9

SPRING BEANS

EFFECTS OF PESTS AND PATHOGENS

Object: To assess the effects of three amounts of pest and disease control on irrigated and unirrigated s. beans - Fosters Corner.

Sponsors: J. McEwen, R. Bardner, A.J. Cockbain, D.H. Lapwood, R.M. Webb, D.P. Yeoman.

Design: 4 randomised blocks of 2 plots split into 3.

Whole plot dimensions: 4.27 x 13.7.

Treatments: All combinations of:-

Whole plots

1. IRRIGATN	Irrigation:	
	NONE	None
	FULL	Full (total 150 mm)

Sub plots

2. PATHCONT	Pest and pathogen control:	
	STANDARD	None
	ENHANCED	Phorate at 2.2 kg, applied to seed furrows Pirimicarb at 0.14 kg on 4 June, 1984 Maneb at 0.8 kg with mancozeb at 0.8 kg on 1 Aug Benomyl at 0.56 kg on 16 Aug
	FULL	Aldicarb at 10 kg on 20 Mar Phorate at 2.2 kg applied to seed furrows Fosetyl-Al at 1.6 kg on 16 May Pirimicarb at 0.14 kg on 4 June Benomyl at 0.56 kg on 6 July and 16 Aug Maneb at 0.8 kg with mancozeb at 0.8 kg on 1 Aug and 16 Aug

NOTES: (1) A planned application of pirimicarb to all plots was omitted because black aphids were few.

(2) Irrigation was applied as follows (mm water):

3 May	25
15 May	25
15 June	25
24 July	25
1 Aug	25
15 Aug	25
Total	150 mm

(3) Treatment sprays were applied in 220 l.

Basal applications: Weedkillers: Simazine at 1.2 kg in 250 l.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/9

Seed: Minden, sown at 200 kg.

Cultivations, etc.:- Ploughed: 6 Dec, 1983. Heavy spring-tine cultivated, aldicarb broadcast, rotary harrowed, phorate applied and seed sown: 20 Mar, 1984. Weedkiller applied: 22 Mar. Combine harvested: 31 Aug. Previous crops: W. wheat 1982, s. barley 1983.

NOTE: Plant counts were made after establishment and components of yield were measured at maturity. Total above ground dry matter and N content were measured in August. Migratory nematodes, root and foliar fungi, aphids, weevils and viruses were counted at intervals during the season. N content of grain was measured.

GRAIN TONNES/HECTARE

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

PATHCONT IRRIGATN	STANDARD	ENHANCED	FULL	MEAN
NONE	3.46	4.13	4.57	4.05
FULL	4.69	5.39	5.59	5.22
MEAN	4.08	4.76	5.08	4.64

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

TABLE	PATHCONT	IRRIGATN* PATHCONT
SED	0.118	0.167

* WITHIN THE SAME LEVEL OF IRRIGATN ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	12	0.235	5.1

GRAIN MEAN DM% 85.7

SUB PLOT AREA HARVESTED 0.00293

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84/R/BE/10

SPRING BEANS

CONTROL OF PRATYLENCHUS

Object: To study the effects of aldicarb and carbofuran on numbers of Pratylenchus nematodes and on the yield of s. beans - Highfield VI.

Sponsor: R.M. Webb.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 5.33 x 13.7.

Treatments:

NEMACIDE	Nematicides, rates and methods of application:
NONE	None
AL BC	Aldicarb at 10 kg, worked into seedbed
	Carbofuran applied to seed furrows at sowing:
CA 1 CD	At 1.7 kg
CA 2 CD	At 2.2 kg
CA 3 CD	At 3.2 kg

Basal applications: Weedkiller: Simazine at 1.2 kg in 250 l.

Seed: Minden, sown at 240 kg.

Cultivations, etc.:- Heavy spring-tine cultivated: 12 Sept, 1983. Ploughed: 15 Dec. Heavy spring-tine cultivated: 19 Mar, 1984. Aldicarb treatment applied, rotary harrowed, seed sown: 21 Mar. Weedkiller applied: 22 Mar. Combine harvested: 31 Aug. Previous crops: W. wheat 1982, s. barley 1983.

NOTE: Soil was sampled for nematodes just before treatments were applied, soil and plants were sampled in late May, and soils and roots in mid-June.

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84/R/BE/10

GRAIN TONNES/HECTARE

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

NEMACIDE	NONE	AL BC	CA 1 CD	CA 2 CD	CA 3 CD	MEAN
	5.03	5.84	6.22	5.90	5.54	5.71

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

TABLE	NEMACIDE
SED	0.178

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

STRATUM	DF	SE	CV%
BLOCK.WP	12	0.252	4.4

GRAIN MEAN DM% 87.6

PLOT AREA HARVESTED 0.00293

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84/R/BE/11

SPRING BEANS

ERYNIA AND APHID CONTROL

Object: To study the effects of applying two amounts of the aphid-pathogenic fungus Erynia neoaphidis to two s. bean cultivars differing in susceptibility to black aphids (Aphis fabae) - Sawyers I East.

Sponsor: S.K. Mardell.

Design: 4 randomised blocks of 2 plots split into 4.

Whole plot dimensions: 2.67 x 2.13.

Treatments: All combinations of:-

Whole plots

1. VARIETY — Varieties and susceptibility to black aphids:

BEAD VS	Maris Bead, very susceptible
HERRA LS	Herra, less susceptible

Sub plots

2. APH CONT — Biological and chemical aphid control:

NONE	None
	E. neoaphidis applied as a powder of mummified aphids on 11 June and on 24 June, 1984:
E NEO 1	At 0.5 mg per plant on each occasion
E NEO 2	At 5.0 mg per plant on each occasion
PIRIMICA	Pirimicarb applied at 0.44 kg in 530 l on 11 June

NOTE: Basal irrigation was applied as follows (mm water):

4 May	25	3 July	12.5
9 May	16	6 July	12.5
15 May	25	13 July	12.5
15 June	20	20 July	12
19 June	12.5	25 July	12
29 June	12.5	27 July	12.5
		Total	185 mm

Basal applications: Manures: Chalk at 5.0 t. Weedkiller: Simazine at 1.2 l in 250 l.

Seed: Sown at 200 kg.

Cultivations, etc.:- Chalk applied: 24 Oct, 1983. Heavy spring-tine cultivated twice: 11 Nov. Ploughed: 8 Dec. Heavy spring-tine cultivated, rotary harrowed: 20 Mar, 1984. Seed sown: 22 Mar. Weedkiller applied: 23 Mar. Harvested by hand: 12 Sept. Previous crops: S. barley 1982 and 1983.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/11

NOTES: (1) Samples of live aphids were examined for infection with Erynia and other fungal pathogens at weekly intervals during June and July.
(2) Aphid numbers were assessed weekly from mid-June to early August.

GRAIN TONNES/HECTARE

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

APH CONT / VARIETY	NONE	E NEO 1	E NEO 2	PIRIMICA	MEAN
BEAD VS	3.81	4.34	4.50	4.82	4.37
HERRA LS	5.08	4.69	3.89	5.75	4.85
MEAN	4.44	4.51	4.19	5.29	4.61

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

TABLE	APH CONT	VARIETY* APH CONT
SED	0.472	0.667

* WITHIN THE SAME LEVEL OF VARIETY ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	18	0.944	20.5

GRAIN MEAN DM% 89.3

SUB PLOT AREA HARVESTED 0.00024

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84/R/BE/12

SPRING BEANS

CONTROL OF STEM NEMATODE

Object: To study the effects of two chemicals, applied at three rates and at two times, on the control of seed-borne infestations of stem nematode (Ditylenchus dipsaci) in a spring and a winter variety of field bean sown in spring - ex-Allotments.

Sponsors: A.G. Whitehead.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 2.3 x 4.6.

Treatments: All combinations of:-

1. VARIETY — Varieties:

BEAD	Maris Bead, spring variety
THROWS	Throws M.S., winter variety

2. NEMACIDE — Nematicides:

ALDICARB	Aldicarb
CARBOFUR	Carbofuran

3. NEM RATE — Rates and times of applying nematicides:

1	1 kg to seed furrow at sowing
2	2 kg to seed furrow at sowing
4	4 kg to seed furrow at sowing
2+2	2 kg to seed furrow at sowing plus 2 kg on 30 May, 1984 to foliage

plus two extra treatments:

EXTRA

BEAD 0	Maris Bead given no nematicide
THROWS 0	Throws M.S. given no nematicide

Basal applications: Manures: (0:14:28) at 450 kg. Weedkiller: Simazine at 1.1 kg in 560 l. Fungicide: Benomyl at 0.56 kg in 280 l on two occasions. Insecticide: Pirimicarb on two occasions, at 0.14 kg in 340 l on the first and in 280 l on the second.

Seed: Throws MS, sown at 240 kg.
Maris Bead, sown at 260 kg.

Cultivations, etc.:- PK applied: 5 Mar, 1984. Seed sown: 8 Mar. Weedkiller applied: 16 Mar. Pirimicarb applied: 13 June. Fungicide applied: 19 June, 2 July. Pirimicarb applied: 18 July. Combine harvested VARIETY BEAD: 13 Aug. Combine harvested VARIETY THROWS: 28 Aug. Previous crops: S. barley 1982, fallow 1983.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/12

GRAIN TONNES/HECTARE

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

NEMACIDE VARIETY	ALDICARB	CARBOFUR	MEAN
BEAD	3.88	3.75	3.82
THROWS	3.79	3.90	3.84
MEAN	3.83	3.83	3.83

NEM RATE VARIETY	1	2	4	2+2	MEAN
BEAD	3.71	3.46	3.78	4.32	3.82
THROWS	3.73	3.84	3.68	4.13	3.84
MEAN	3.72	3.65	3.73	4.22	3.83

NEM RATE NEMACIDE	1	2	4	2+2	MEAN
ALDICARB	3.66	3.59	3.79	4.28	3.83
CARBOFUR	3.77	3.71	3.67	4.16	3.83
MEAN	3.72	3.65	3.73	4.22	3.83

VARIETY	NEM RATE NEMACIDE	1	2	4	2+2
BEAD	ALDICARB	3.90	3.36	3.86	4.40
	CARBOFUR	3.51	3.56	3.70	4.24
THROWS	ALDICARB	3.42	3.82	3.73	4.17
	CARBOFUR	4.03	3.86	3.63	4.08

EXTRA	BEAD 0	THROWS 0	MEAN
	3.45	3.63	3.54

GRAND MEAN 3.80

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

TABLE	EXTRA	VARIETY	NEMACIDE	NEM RATE
SED	0.322	0.117	0.117	0.166

TABLE	VARIETY NEMACIDE	VARIETY NEM RATE	NEMACIDE NEM RATE	VARIETY NEMACIDE NEM RATE & EXTRA
SED	0.166	0.235	0.235	0.332

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.332	8.7

GRAIN MEAN DM% 80.3 PLOT AREA HARVESTED 0.00070

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/14

SPRING BEANS

VARIETIES

Object: To compare agronomic characters and yields of four varieties of s. beans - Long Hoos III 7.

Sponsors: J. McEwen, D.P. Yeoman.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments:

VARIETY Varieties:

ALFRED
MINDEN
NABOR
TROY

Note: Seed was sown by hand in rows 51 cm apart, seed spaced 5 cm apart in the row.

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Glyphosate at 0.72 kg in 200 l; trietazine at 0.95 kg with simazine at 0.14 kg in 220 l. Fungicides: Benomyl at 0.56 kg in 220 l on two occasions, the first with pirimicarb; propiconazole at 0.12 kg in 220 l. Insecticides: Permethrin at 0.15 kg in 220 l; cypermethrin at 0.025 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l on three occasions, the second with the benomyl.

Cultivations, etc.:- Chalk applied: 26 Aug, 1983. Glyphosate applied: 16 Dec. Ploughed: 30 Jan, 1984. Power harrowed, seed sown: 16 Mar. Trietazine and simazine applied: 30 Mar. Permethrin applied: 1 May. Cypermethrin applied: 16 May, 6 June. Pirimicarb applied: 4 June, 26 July. Pirimicarb with benomyl applied: 6 July. Propiconazole applied: 1 Aug. Benomyl applied: 14 Aug. Harvested by hand: 24 Aug. Previous crops: S. wheat 1982, mixed cereals 1983.

NOTE: Plant counts were made after establishment. Components of yield were measured at maturity. N content of grain was measured.

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/14

GRAIN TONNES/HECTARE

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

VARIETY	ALFRED	MINDEN	NABOR	TROY	MEAN
	4.47	4.31	4.60	4.82	4.55

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

TABLE	VARIETY
SED	0.235

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

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.333	7.3

GRAIN MEAN DM% 87.7

PLOT AREA HARVESTED 0.00015

https://doi.org/10.23637/ERADOC-1-32 *pp 22*

84/R/BE/15

SPRING BEANS

SEED RATES AND PLANT HEALTH

Object: To study the effects of three seed rates and two standards of plant health on the yield of s. beans - Long Hoos III O and E.

Sponsors: J. McEwen, D.P. Yeoman.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 2.40 x 3.00.

Treatments: All combinations of:-

1. POPULATN — Plant populations per hectare:

	Target population	Mean Population achieved
200	200,000	210,000
400	400,000	420,000
600	600,000	560,000

2. PATHCONT — Pest and pathogen control:

STANDARD — Pirimicarb at 0.14 kg in 220 l on 6 July, 1984

ENHANCED — Permethrin at 0.15 kg in 220 l on 1 May
Cypermethrin at 0.025 kg in 220 l on 16 May, 6 June
Pirimicarb at 0.14 kg in 220 l on 4 June, 6 July
Benomyl at 0.56 kg in 220 l on 6 July, 14 Aug
Propiconazole at 0.12 kg in 220 l on 1 Aug

Basal applications: Weedkillers: Trietazine at 0.95 kg with simazine at 0.14 kg in 220 l.

Seed: Minden.

Cultivations, etc.:- Ploughed: 7 Dec, 1983. Spring-tine cultivated, seed sown: 20 Mar, 1984. Weedkillers applied: 2 Apr. Harvested by hand: 23 Aug. Previous crops: S. barley 1982 and 1983.

NOTE: Plant counts were made after establishment and components of yield were measured at maturity.

https://doi.org/10.23637/ERADOC-1-32 *pp 23*

84/R/BE/15

GRAIN TONNES/HECTARE

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

PATHCONT POPULATN	STANDARD	ENHANCED	MEAN
200	3.99	4.10	4.05
400	3.97	4.30	4.14
600	4.08	4.55	4.32
MEAN	4.01	4.32	4.17

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

TABLE	POPULATN	PATHCONT	POPULATN PATHCONT
SED	0.163	0.133	0.231

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

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.326	7.8

GRAIN MEAN DM% 88.8

PLOT AREA HARVESTED 0.00015

https://doi.org/10.23637/ERADOC-1-32 *pp 24*

84/R/BE/16

SPRING BEANS

CONTROL OF RUST

Object: To study the effects of fungicides on the control of rust (Uromyces viciae-fabae) and on the yield of unirrigated and irrigated s. beans - Long Hoos IV 3.

Sponsors: D.H. Lapwood, J. McEwen, D.P. Yeoman.

Design: 2 randomised blocks of 2 plots split into 12.

Whole plot dimensions: 2.03 x 2.13.

Treatments: All combinations of:-

Whole plots

1. IRRIGATN	Irrigation:	
	0	None
	I	Irrigated (86 mm)

Sub plots

2. C S FUNG	Fungicide to control chocolate spot but not rust:	
	NONE	None
	BENOMYL	Benomyl at 0.56 kg in 220 l on 6 July, 14 Aug, 1984
3. RUSTFUNG	Fungicides to control rust:	
	MAN+MANC	Maneb at 0.8 kg + mancozeb at 0.8 kg in 340 l
	PROPICON	Propiconazole at 0.12 kg in 340 l
4. RFNGTIME	Times of applying fungicides to control rust:	
	ONCE	Once on 1 Aug
	TWICE	Twice, on 1 Aug and 8 Aug

plus two extra sub plot treatments:

EXTRA	
NONE	No fungicides (duplicated)
BENOMYL	Benomyl at 0.56 kg in 220 l on 6 July, 14 Aug (duplicated)

NOTE: After two post-flowering applications totalling 38 mm irrigation was applied subsequently at 8 mm, on two occasions per week, unless 4 mm or more of rain had fallen since the last application.

https://doi.org/10.23637/ERADOC-1-32 *pp 25*

84/R/BE/16

Date	mm water
13 July	13
20 July	25
24 July	8
27 July	8
31 July	8
3 Aug	8
21 Aug	8
24 Aug	8
Total	86 mm

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Trietazine at 0.95 kg with simazine at 0.14 kg in 220 l. Insecticides: Permethrin at 0.15 kg in 220 l; cypermethrin at 0.025 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l on two occasions.

Seed: Minden, sown at 200 kg.

Cultivations, etc.:- Chalk applied: 25 Aug, 1983. Ploughed: 17 Nov. Spring-tine cultivated, seed sown: 19 Mar, 1984. Weedkillers applied: 2 Apr. Permethrin applied: 1 May. Cypermethrin applied: 16 May, 6 June. Pirimicarb applied: 4 June, 6 July. Harvested by hand: 23 Aug (unirrigated plots), 30 Aug (irrigated plots). Previous crops: Potatoes 1982, s. wheat 1983.

NOTE: Plant counts were made after establishment. The incidence of chocolate spot and rust were assessed from early July until maturity. Components of yield were measured at maturity.

GRAIN TONNES/HECTARE

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

C S FUNG	NONE	BENOMYL	MEAN
IRRIGATN			
0	4.78	4.47	4.63
I	5.37	5.27	5.32
MEAN	5.08	4.87	4.97

RUSTFUNG	MAN+MANC	PROPICON	MEAN
IRRIGATN			
0	4.77	4.48	4.63
I	5.43	5.21	5.32
MEAN	5.10	4.85	4.97

https://doi.org/10.23637/ERADOC-1-32 *pp 26*

84/R/BE/16

GRAIN TONNES/HECTARE

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

RUSTFUNG C S FUNG	MAN+MANC	PROPICON	MEAN
NONE	5.35	4.80	5.08
BENOMYL	4.85	4.89	4.87
MEAN	5.10	4.85	4.97

RFNGTIME IRRIGATN	ONCE	TWICE	MEAN
0	4.86	4.40	4.63
I	5.31	5.32	5.32
MEAN	5.09	4.86	4.97

RFNGTIME C S FUNG	ONCE	TWICE	MEAN
NONE	5.22	4.93	5.08
BENOMYL	4.95	4.78	4.87
MEAN	5.09	4.86	4.97

RFNGTIME RUSTFUNG	ONCE	TWICE	MEAN
MAN+MANC	5.26	4.94	5.10
PROPICON	4.91	4.78	4.85
MEAN	5.09	4.86	4.97

C S FUNG	NONE		BENOMYL	
RUSTFUNG IRRIGATN	MAN+MANC	PROPICON	MAN+MANC	PROPICON
0	5.09	4.48	4.45	4.49
I	5.61	5.13	5.24	5.29

C S FUNG	NONE		BENOMYL	
RFNGTIME IRRIGATN	ONCE	TWICE	ONCE	TWICE
0	5.04	4.53	4.68	4.26
I	5.41	5.33	5.22	5.31

RUSTFUNG	MAN+MANC		PROPICON	
RFNGTIME IRRIGATN	ONCE	TWICE	ONCE	TWICE
0	5.06	4.49	4.66	4.31
I	5.46	5.39	5.17	5.25

RUSTFUNG	MAN+MANC		PROPICON	
RFNGTIME C S FUNG	ONCE	TWICE	ONCE	TWICE
NONE	5.42	5.28	5.02	4.59
BENOMYL	5.09	4.60	4.81	4.97

https://doi.org/10.23637/ERADOC-1-32 *pp 27*

84/R/BE/16

GRAIN TONNES/HECTARE

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

	RUSTFUNG	MAN+MANC		PROPICON	
	RFNGTIME	ONCE	TWICE	ONCE	TWICE
IRRIGATN	C S FUNG				
0	NONE	5.29	4.89	4.78	4.17
	BENOMYL	4.82	4.08	4.54	4.44
I	NONE	5.56	5.66	5.25	5.00
	BENOMYL	5.36	5.12	5.08	5.50

EXTRA			
IRRIGATN	NONE	BENOMYL	MEAN
0	4.41	4.45	4.43
I	5.24	5.41	5.32
MEAN	4.82	4.93	4.87

GRAND MEAN 4.94

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

TABLE	EXTRA	C S FUNG	RUSTFUNG	RFNGTIME
SED	0.140	0.099	0.099	0.099

TABLE	IRRIGATN* C S FUNG	IRRIGATN* RUSTFUNG	C S FUNG RUSTFUNG	IRRIGATN* RFNGTIME
SED	0.140	0.140	0.140	0.140

TABLE	C S FUNG RFNGTIME	RUSTFUNG RFNGTIME	IRRIGATN* C S FUNG RUSTFUNG	IRRIGATN* C S FUNG RFNGTIME
SED	0.140	0.140	0.198	0.198

TABLE	IRRIGATN* RUSTFUNG RFNGTIME	C S FUNG RUSTFUNG RFNGTIME	IRRIGATN* C S FUNG RUSTFUNG RFNGTIME	IRRIGATN* EXTRA
SED	0.198	0.198	0.281	0.198

* WITHIN THE SAME LEVEL OF IRRIGATN

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

STRATUM	DF	SE	CV%
BLOCK.WP	26	0.281	5.7

GRAIN MEAN DM% 89.2

PLOT AREA HARVESTED 0.00015

https://doi.org/10.23637/ERADOC-1-32

84/R/BE/18

SPRING BEANS

FUNGICIDES FOR RUST CONTROL

Object: To study the effects of a range of fungicides on the control of rust (Uromyces viciae-fabae) and on the yield of s. beans - Long Hoos IV 3.

Sponsors: D.H. Lapwood, J. McEwen, D.P. Yeoman.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments: All combinations of:-

1. RUSTFUNG — Fungicides to control rust:

FENPROP	Fenpropimorph at 0.7 kg
MANEB	Maneb at 0.8 kg
MANCOZEB	Mancozeb at 0.8 kg
MAN+MANC	Maneb at 0.8 kg plus mancozeb at 0.8 kg
PROPICON	Propiconazole at 0.12 kg
THIRAM	Thiram at 2.5 kg
TRIADIME	Triadimefon at 0.5 kg
ZIN+TRID	Zineb polyethylene thiram disulphide at 1.6 kg plus tridemorph at 0.53 kg

2. RFNGTIME — Times of applying fungicides to control rust:

ONCE	Once on 1 Aug, 1984
TWICE	Twice, on 1 Aug and 8 Aug

plus one extra treatment:

EXTRA

NONE	No fungicides to control rust (duplicated)

NOTE: All sprays were applied in 340 l.

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Trietazine at 0.95 kg with simazine at 0.14 kg in 220 l. Fungicide: Benomyl at 0.56 kg in 220 l with pirimicarb. Insecticides: Permethrin at 0.15 kg in 220 l; cypermethrin at 0.025 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l on two occasions, the second with the benomyl.

Seed: Minden, sown at 200 kg.

Cultivations, etc.:- Chalk applied: 25 Aug, 1983. Ploughed: 17 Nov. Spring-tine cultivated, seed sown: 19 Mar, 1984. Weedkillers applied: 2 Apr. Permethrin applied: 1 May. Cypermethrin applied: 16 May, 6 June. Pirimicarb applied: 4 June. Pirimicarb with benomyl applied: 6 July. Harvested by hand: 6 Sept. Previous crops: Potatoes 1982, s. wheat 1983.

https://doi.org/10.23637/ERADOC-1-32 *pp 29*

84/R/BE/18

NOTES: (1) Plant counts were made after establishment. Amounts of chocolate spot and rust were assessed from early July until maturity. Components of yield were measured at maturity.
(2) One plot was accidentally damaged while laying out irrigation equipment, with treatment combination FENPROP ONCE, an estimated value was used in the analysis.

GRAIN TONNES/HECTARE

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

RFNGTIME RUSTFUNG	ONCE	TWICE	MEAN
FENPROP	5.08	5.53	5.30
MANEB	5.26	4.81	5.03
MANCOZEB	6.31	5.70	6.01
MAN+MANC	6.03	5.41	5.72
PROPICON	5.33	4.98	5.16
THIRAM	5.63	4.87	5.25
TRIADIME	5.25	5.70	5.48
ZIN+TRID	5.56	5.42	5.49
MEAN	5.55	5.30	5.43

NONE 5.53

GRAND MEAN 5.44

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

TABLE	RUSTFUNG	RFNGTIME	RUSTFUNG RFNGTIME
SED	0.386	0.193	0.546

SED FOR COMPARING NONE WITH ANY ITEM
IN RUSTFUNG.RFNGTIME TABLE IS 0.473

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

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.546	10.0

GRAIN MEAN DM% 89.8

PLOT AREA HARVESTED 0.00015

https://doi.org/10.23637/ERADOC-1-32