ROTHAMSTED RESEARCH

Yields of the Field Experiments 1985

Full Table of Content

Field Beans

Rothamsted Research

Rothamsted Research (1986) *Field Beans ;* Yields Of The Field Experiments 1985, pp 254 - 280 **- DOI: https://doi.org/10.23637/ERADOC-1-19**

85/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 - Appletree.

Sponsors: J. McEwen, 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 19 Apr, 1985
FULL	Seed dressed with carbendazim and thiram Aldicarb at 10 kg on 15 Oct, 1984 Fosetyl-Al at 1.6 kg, benomyl at 0.56 kg and chlorothalonil at 1.0 kg on 7 Mar, 1985 Carbofuran at 1.7 kg on 19 Apr Chlorothalonil at 1.0 kg, benomyl at 0.56 kg and deltamethrin at 0.0075 kg on 22 May Propiconazole at 0.12 kg, benomyl at 0.56 kg and pirimicarb at 0.14 kg on 23 July

NOTES: (1) Treatment sprays were applied in 220 l.
(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: Simazine at 1.2 kg with propyzamide at 0.85 kg in 250 l. Fungicides: Chlorothalonil at 1.0 kg with benomyl at 0.50 kg and a wetting agent ('Agral' at 0.075 l) on three occasions in 240 l, 500 l and 200 l respectively.

Seed: Banner, undressed seed sown at 150 kg, dressed seed sown at 140 kg.

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85/R/BE/1

Cultivations, etc.:- Heavy spring-tine cultivated: 5 Sept, 1984. Ploughed: 14 Sept. Rotary harrowed: 19 Sept. Aldicarb treatment applied, spring-tine cultivated, seed sown: 15 Oct. Weedkillers applied: 31 Oct. Basal fungicides applied: 29 May, 11 June, 3 July, 1985. Combine harvested: 24 Sept. Previous crops: S. wheat 1983, w. wheat 1984.

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

GRAIN TONNES/HECTARE

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

PATHCONT	STANDARD	ENHANCED	FULL	MEAN
	4.34	4.49	4.97	4.60

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

TABLE	PATHCONT
SED	0.245

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

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.425	9.2

GRAIN MEAN DM% 78.3

PLOT AREA HARVESTED 0.00320

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85/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 - Appletree.

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

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:

26 SEP	26 September, 1984
1 NOV	1 November

3. POPULATN — Plant populations per hectare:

	Target Population	Mean population achieved
120	120,000	130,000
240	240,000	250,000
360	360,000	340,000

plus three extra treatments, duplicated, all with seed broadcast and ploughed in on 11 December:

PL 11DEC	Target Population	Population achieved
120	120,000	100,000
240	240,000	160,000
360	360,000	240,000

NOTE: The extra treatments replaced those planned for a third level of SOW DATE which could not be achieved because conditions were too wet to permit drilling.

Basal applications: Weedkillers: Trietazine at 1.2 kg with simazine at 0.17 kg in 250 l on SOW DATE, 26 SEP and 1 NOV and in 500 l on SOW DATE PL 11DEC. Fungicides: Chlorothalonil at 1.0 kg with benomyl at 0.50 kg and a wetting agent ('Agral' at 0.075 l) on three occasions in 240 l, 500 l and 200 l respectively. Insecticides: Deltamethrin at 0.0079 kg on two occasions, in 500 l and 200 l respectively; pirimicarb at 0.14 kg in 200 l.

Seed: Banner, dressed with carbendazim and thiram.

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85/R/BE/2

Cultivations, etc.:- Heavy spring-tine cultivated: 5 Sept, 1984. Ploughed: 14 Sept. Rotary harrowed: 19 Sept. SOWDATE 26 SEP seed sown or broadcast: 26 Sept. SOW DATE 26 SEP PLOUGH plots ploughed: 27 Sept. Weedkillers applied to SOWDATE 26 SEP: 9 Oct. SOWDATE 1 NOV plots seed sown or broadcast, broadcast plots ploughed: 1 Nov. Weedkillers applied to SOWDATE 1 NOV: 2 Nov. PL 11DEC plots seed broadcast and ploughed in: 11 Dec. Weedkillers applied to PL 11DEC plots: 1 Feb, 1985. Deltamethrin applied: 3 May, 23 May. Fungicides applied: 29 May, 11 June, 3 July. Pirimicarb applied: 23 July. Combine harvested: 24 Sept. Previous crops: S. wheat 1983, w. wheat 1984.

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

GRAIN TONNES/HECTARE

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

SOW DATE	26 SEP	1 NOV	MEAN
SOW METH			
DRILL	4.15	4.30	4.23
PLOUGH	4.72	4.59	4.66
MEAN	4.43	4.45	4.44

POPULATN	120	240	360	MEAN
SOW METH				
DRILL	4.23	4.44	4.01	4.23
PLOUGH	4.97	4.49	4.51	4.66
MEAN	4.60	4.47	4.26	4.44

POPULATN	120	240	360	MEAN
SOW DATE				
26 SEP	4.64	4.52	4.15	4.43
1 NOV	4.55	4.41	4.38	4.45
MEAN	4.60	4.47	4.26	4.44

	POPULATN	120	240	360
SOW METH	SOW DATE			
DRILL	26 SEPT	4.31	4.37	3.77
	1 NOV	4.14	4.50	4.26
PLOUGH	26 SEPT	4.97	4.67	4.52
	1 NOV	4.96	4.32	4.50

PL 11DEC	120	240	360
	3.30	3.81	4.20

GRAND MEAN 4.22

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85/R/BE/2

GRAIN TONNES/HECTARE

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

TABLE	PL 11DEC	SOW METH	SOW DATE	POPULATN
SED	0.134	0.077	0.077	0.095

TABLE	SOW METH SOW DATE	SOW METH POPULATN	SOW DATE POPULATN	SOW DATE SOW METH POPULATN
SED	0.110	0.134	0.134	0.190

SED FOR COMPARING ANY ITEM IN
PL 11DEC TABLE WITH ANY ITEM IN
SOW DATE.SOW METH.POPULATN IS 0.164

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

STRATUM	DF	SE	CV%
BLOCK.WP	20	0.190	4.5

GRAIN MEAN DM% 73.9

PLOT AREA HARVESTED 0.00310

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85/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 - Appletree.

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

Design: 4 randomised blocks of 8 plots.

Whole plot dimensions: 5.33 x 13.7.

Treatments:

INSCTCDE	Forms, rates and methods of applying insecticides:
NONE	None
CF 1 G	Carbofuran at 0.425 kg, as granules, applied on 19 April, 1985
CF 2 G	Carbofuran at 0.850 kg, as granules, applied on 19 April
CY DS	Cyfluthrin at 0.050 kg as a divided spray, half applied on 10 May, half on 22 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
PE SS	Permethrin at 0.050 kg as a single spray applied on 10 May
PH 1 G	Phorate at 0.850 kg, as granules, applied on 19 April
PH 2 G	Phorate at 1.700 kg, as granules, applied on 19 April

Basal applications: Weedkillers: Simazine at 1.2 kg with propyzamide at 0.85 kg in 250 l. Fungicides: Chlorothalonil at 1.0 kg with benomyl at 0.50 kg and a wetting agent ('Agral' at 0.075 l) on three occasions in 240 l, 500 l and 200 l respectively.

Seed: Banner, dressed with carbendazim and thiram, sown at 150 kg.

Cultivations, etc.:- Heavy spring-tine cultivated: 5 Sept, 1984. Ploughed: 14 Sept. Rotary harrowed: 19 Sept. Spring-tine cultivated, seed sown: 15 Oct. Weedkillers applied: 31 Oct. Fungicides applied: 29 May, 1985, 11 June and 3 July. Combine harvested: 24 Sept. Previous crops: S. wheat 1983, w. wheat 1984.

NOTE: Leaf damage by Sitona was assessed in May.

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85/R/BE/3

GRAIN TONNES/HECTARE

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

INSCTCDE	
NONE	4.45
CF 1 G	4.61
CF 2 G	4.82
CY DS	4.40
PE DS	4.74
PE SS	4.45
PH 1 G	4.73
PH 2 G	4.58
MEAN	4.60

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

TABLE	INSCTCDE
SED	0.192

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

STRATUM	DF	SE	CV%
BLOCK.WP	21	0.271	5.9

GRAIN MEAN DM% 79.1

PLOT AREA HARVESTED 0.00293

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85/R/BE/4

WINTER BEANS

VARIETIES

Object: To compare agronomic characters and yields of three varieties of w. beans sown at two populations - Long Hoos VI/VII 1.

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

Design: 3 randomised blocks of 6 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments: All combinations of:-

1. VARIETY — Varieties:

BANNER	Banner
BEAGLE	Maris Beagle
BOURDON	Bourdon

2. POPULATN — Plant populations per hectare:

	Target population	Mean population achieved
130	130,000	120,000
390	390,000	360,000

NOTE: Seed was sown by hand in rows 51 cm apart.

Basal applications: Manures: Chalk at 2.9 t. Muriate of potash at 520 kg. Weedkillers: Glyphosate at 1.4 kg in 220 l; trietazine at 1.2 kg with simazine at 0.17 kg in 220 l. Fungicides: Benomyl at 0.56 kg plus chlorothalonil at 1.0 kg applied with the second application of deltamethrin; propiconazole at 0.12 kg in 220 l on two occasions. Insecticides: Deltamethrin at 0.0075 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l.

Cultivations, etc.:- Chalk applied: 11 Sept, 1984. K applied: 25 Sept. Glyphosate applied: 26 Sept. Ploughed: 15 Oct. Spring-tine cultivated twice, seed sown, trietazine and simazine applied: 16 Oct. Deltamethrin applied: 2 May, 1985. Deltamethrin with benomyl and chlorothalonil applied: 22 May. Propiconazole applied: 3 June. Pirimicarb applied: 20 June. Propiconazole applied: 9 July. Harvested by hand: 5 Sept. Previous crops: Potatoes 1983, s. barley 1984.

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

https://doi.org/10.23637/ERADOC-1-19

85/R/BE/4

GRAIN TONNES/HECTARE

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

POPULATN VARIETY	130	390	MEAN
BANNER	4.43	5.20	4.81
BEAGLE	5.23	5.03	5.13
BOURDON	5.23	5.48	5.36
MEAN	4.96	5.24	5.10

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

TABLE	VARIETY	POPULATN	VARIETY POPULATN
SED	0.365	0.298	0.515

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

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.631	12.4

GRAIN MEAN DM% 81.0

PLOT AREA HARVESTED 0.00015

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85/R/BE/6

SPRING BEANS

CONTROL OF PRATYLENCHUS

Object: To study the effects of aldicarb, carbofuran and phorate on numbers of Pratylenchus nematodes and on the yield of s. beans - Great Harpenden II.

Sponsor: R.M. Webb.

Design: 4 randomised blocks of 8 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
	Phorate applied to seed furrows at sowing:
PH 1 CD	At 3.0 kg
PH 2 CD	At 4.5 kg
PH 3 CD	At 6.0 kg

Basal applications: Manures: Chalk at 5.0 t. Weedkiller: Simazine at 1.2 kg in 200 l.

Seed: Minden, sown at 260 kg.

Cultivations, etc.:- Chalk applied: 23 Aug, 1984. Ploughed: 9 Nov. Heavy spring-tine cultivated, spring-tine cultivated: 18 Mar, 1985. Aldicarb treatment applied, harrowed in, seed sown: 20 Mar. Weedkiller applied: 25 Mar. Combine harvested: 25 Sept. Previous crops: S. wheat 1983, s. barley 1984.

NOTE: Soil was sampled for nematodes just before treatments were applied, and both soil and plant roots were sampled in April and June.

https://doi.org/10.23637/ERADOC-1-19 *pp 11*

85/R/BE/6

GRAIN TONNES/HECTARE

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

NEMACIDE	
NONE	4.90
AL BC	4.91
CA 1 CD	5.21
CA 2 CD	5.07
CA 3 CD	5.14
PH 1 CD	4.88
PH 2 CD	4.94
PH 3 CD	5.12
MEAN	5.02

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

TABLE	NEMACIDE
SED	0.136

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

STRATUM	DF	SE	CV%
BLOCK.WP	21	0.193	3.8

GRAIN MEAN DM% 83.2

PLOT AREA HARVESTED 0.00293

https://doi.org/10.23637/ERADOC-1-19

85/R/BE/7

SPRING BEANS

CONTROL OF STEM NEMATODE

Object: To study the effects of rates, times and methods of applying nematicides on the control of seed-borne infestation by stem nematode (Ditylenchus dipsaci) and on the yield of s. beans - Little Knott I.

Sponsor: A.G. Whitehead.

Design: 3 randomised blocks of 17 plots.

Whole plot dimensions: 2.29 x 4.57.

Treatments: All combinations of:-

1. NEMACIDE	Nematicides:
ALDICARB	Aldicarb
CARBOFUR	Carbofuran
2. NEM RATE	Rates of nematicides (kg):
1	1 to seed furrows at sowing
2	2 to seed furrows at sowing
4	4 to seed furrows at sowing
2+2	2 to seed furrows at sowing + 2 post emergence on 11 June, 1985

plus eight extra treatments:

EXTRA	
NONE	None (duplicated)
	Post-emergence sprays, applied at 1.5 kg, in addition to carbofuran at 2 kg to seed furrow at sowing:
CA2 TB C	Thiabendazole applied by conventional sprayer
CA2 TB E	Thiabendazole applied by electrostatic sprayer
CA2 CZ C	Carbendazim applied by conventional sprayer
CA2 CZ E	Carbendazim applied by electrostatic sprayer
CA2 TD C	Thiodicarb applied by conventional sprayer
CA2 TD E	Thiodicarb applied by electrostatic sprayer
CA2 DI C	Dimethoate applied by conventional sprayer

NOTE: Conventional sprayer treatments were applied in 310 l on 24 June, and electrostatic sprays in 5.7 l on 25 June.

Basal applications: Manures: (0:24:24) at 450 kg. Weedkiller: Simazine at 1.1 kg in 620 l. Fungicide: Benomyl at 0.56 kg in 280 l. Insecticide: Pirimicarb at 0.14 kg in 280 l on two occasions.

Seed: Maris Bead, sown at 260 kg.

Cultivations, etc.:- Cultivated by rotary digger: 18 Dec, 1984. PK applied: 11 Mar, 1985. Seed sown and seedbed treatments applied: 12 Mar. Weedkiller applied: 15 Mar. Pirimicarb applied: 2 July, 25 July. Benomyl applied: 3 July. Harvested by hand: 4 Sept. Previous crops: W. wheat 1983, sugar beet 1984.

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85/R/BE/7

NOTES: (1) Because of a harvesting error yields of four plots were lost. Those with treatment combinations

NEMACIDE	CARBOFUR	ALDICARB	ALDICARB
NEM RATE	2	4	2+2

and EXTRA CA2 TD C. Estimated values were used in the analysis.

(2) Stem nematode infestations were assessed in the stems after flowering and in the seed after harvest.

GRAIN TONNES/HECTARE

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

NEM RATE	1	2	4	2+2	MEAN
NEMACIDE					
ALDICARB	5.77	5.78	5.47	6.53	5.89
CARBOFUR	5.93	6.02	5.86	5.35	5.79
MEAN	5.85	5.90	5.67	5.94	5.84

EXTRA	
NONE	5.34
CA2 TB C	5.56
CA2 TB E	5.76
CA2 CZ C	5.62
CA2 CZ E	5.99
CA2 TD C	6.44
CA2 TD E	5.51
CA2 DI C	5.44
MEAN	5.67

GRAND MEAN 5.75

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

TABLE	NEMACIDE	NEM RATE	NEMACIDE NEM RATE	EXTRA	
SED	0.210	0.296	0.419	0.419	MIN REP
				0.314	MAX-MIN

	EXTRA
MAX-MIN	NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

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

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.513	8.9

GRAIN MEAN DM% 76.7

PLOT AREA HARVESTED 0.00035

https://doi.org/10.23637/ERADOC-1-19

85/R/BE/8

SPRING BEANS

ERYNIA AND APHID CONTROL

Object: To study the effects of two methods of applying the aphid-pathogenic fungus Erynia neoaphidis on the number of black aphids (Aphis fabae) and on the yield of s. beans - Little Knott I.

Sponsor: S.K. Mardell.

Design: 5 randomised blocks of 4 plots.

Whole plot dimensions: 2.67 x 2.13.

Treatments:

APH CONT	Chemical and biological aphid control:
NONE	None
EN CULT	E. neoaphidis culture, applied as mycelium
EN APHID	E. neoaphidis applied as mummified aphids
PIRIMICA	Pirimicarb at 0.22 kg in 530 l on 2 July, 1985

NOTES: (1) The culture was applied as 2.23 kg dry mycelium in suspension of water at 970 l on 14 July, 1985. Mummified aphids were applied at 0.5 mg per plant on 1 July, repeated on 8 July.
(2) Basal irrigation was applied as follows (mm water):

4 May	12.5
9 May	12.5
18 May	12.5
3 June	12.5
17 June	12.5
5 July	12.5
14 July	12.5
Total	87.5 mm

Basal applications: Weedkiller: Simazine at 1.2 kg in 200 l.

Seed: Minden, sown at 220 kg.

Cultivations, etc.:- Cultivated by rotary digger: 28 Nov, 1984. Deep spring-tine cultivated, spring-tine cultivated, seed sown: 19 Mar, 1985. Weedkiller applied: 25 Mar. Combine harvested: 27 Sept. Previous crops: S. barley 1983, potatoes 1984.

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.

https://doi.org/10.23637/ERADOC-1-19 *pp 15*

85/R/BE/8

GRAIN TONNES/HECTARE

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

APH CONT	NONE	EN CULT	EN APHID	PIRIMICA	MEAN
	4.52	4.41	4.74	4.87	4.64

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

TABLE	APH CONT
SED	0.292

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

STRATUM	DF	SE	CV%
BLOCK.WP	12	0.461	9.9

GRAIN MEAN DM% 89.6

PLOT AREA HARVESTED 0.00024

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85/R/BE/9

SPRING BEANS

VARIETIES

Object: To compare agronomic characters and yields of four varieties of s. beans - Long Hoos VI/VII 4.

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
TICOL
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: Trietazine at 1.2 kg with simazine at 0.17 kg and paraquat at 0.40 kg ion in 220 l. Fungicides: Benomyl at 0.55 kg in 220 l; propiconazole at 0.12 kg in 220 l on two occasions. Insecticides: Deltamethrin at 0.0075 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l.

Cultivations, etc.:- Chalk applied: 12 Sept, 1984. Ploughed: 12 Nov. Spring-tine cultivated, seed sown: 14 Mar, 1985. Weedkillers applied: 18 Mar. Deltamethrin applied: 2 May, 23 May. Pirimicarb applied: 1 July. Benomyl applied: 2 July. Propiconazole applied: 17 July, 22 Aug. Harvested by hand, ALFRED & TROY: 11 Sept; MINDEN & TICOL: 16 Sept. Previous crops: W. wheat 1983 & 1984.

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

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85/R/BE/9

GRAIN TONNES/HECTARE

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

VARIETY	ALFRED	MINDEN	TICOL	TROY	MEAN
	5.78	5.91	4.39	5.11	5.30

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

TABLE	VARIETY
SED	0.193

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

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.274	5.2

GRAIN MEAN DM% 86.5

PLOT AREA HARVESTED 0.00015

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85/R/BE/10

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 VI/VII 4.

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	170,000
400	400,000	350,000
600	600,000	480,000

2. PATHCONT — Pest and pathogen control:

STANDARD	Pirimicarb at 0.14 kg in 220 l on 1 July, 1985
ENHANCED	Deltamethrin at 0.0075 kg in 220 l on 2 May, 23 May
	Pirimicarb at 0.14 kg in 220 l on 1 July
	Benomyl at 0.56 kg in 220 l on 2 July
	Propiconazole at 0.12 kg in 220 l on 18 July, 22 Aug

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Trietazine at 1.2 kg with simazine at 0.17 kg and paraquat at 0.40 kg ion in 220 l.

Seed: Minden.

Cultivations, etc.:- Chalk applied: 12 Sept, 1984. Ploughed: 12 Nov. Spring-tine cultivated, seed sown: 14 Mar, 1985. Weedkillers applied: 18 Mar. Harvested by hand: 19 Sept. Previous crops: W. wheat 1983 and 1984.

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

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85/R/BE/10

GRAIN TONNES/HECTARE

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

PATHCONT POPULATN	STANDARD	ENHANCED	MEAN
200	5.19	5.69	5.44
400	5.01	5.79	5.40
600	4.98	6.05	5.51
MEAN	5.06	5.85	5.45

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

TABLE	POPULATN	PATHCONT	POPULATN PATHCONT
SED	0.241	0.197	0.341

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

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.482	8.8

GRAIN MEAN DM% 91.0

PLOT AREA HARVESTED 0.00015

https://doi.org/10.23637/ERADOC-1-19 *pp 20*

85/R/BE/11

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 VI/VII I.

Sponsors: 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 (33 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 1 July, 1985, 31 July
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:
	DOUBLE	1 July, 1985, 31 July
	QUADRUP	1 July, 15 July, 31 July, 12 Aug

plus two extra sub plot treatments:

EXTRA	
NONE	No fungicides (duplicated)
BENOMYL	Benomyl at 0.56 kg in 220 l on 1 July, 31 July (duplicated)

NOTE: Irrigation was applied to lessen a post-flowering soil-moisture deficit from 50 mm to 25 mm. This was necessary on only one occasion, on 18 July, when 33 mm was applied.

Basal applications: Manures: Chalk at 2.9 t. Muriate of potash at 520 kg. Weedkillers: Glyphosate at 1.4 kg in 220 l; trietazine at 1.2 kg with simazine at 0.17 kg and paraquat at 0.40 kg ion in 220 l. Insecticides: Deltamethrin at 0.0075 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l on two occasions.

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85/R/BE/11

Seed: Minden, sown at 220 kg.

Cultivations, etc.:- Chalk applied: 11 Sept, 1984. K applied: 25 Sept. Glyphosate applied: 26 Sept. Ploughed: 15 Oct. Spring-tine cultivated, seed sown: 13 Mar, 1985. Trietazine, simazine and paraquat applied: 19 Mar. Deltamethrin applied: 2 May, 23 May. Pirimicarb applied: 20 June, 17 July. Harvested by hand: 18 Sept. Previous crops: Potatoes 1983, s. barley 1984.

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 IRRIGATN	NONE	BENOMYL	MEAN
0	5.80	5.46	5.63
I	5.95	6.11	6.03
MEAN	5.87	5.78	5.83

RUSTFUNG IRRIGATN	MAN+MANC	PROPICON	MEAN
0	6.03	5.24	5.63
I	5.89	6.16	6.03
MEAN	5.96	5.70	5.83

RUSTFUNG C S FUNG	MAN+MANC	PROPICON	MEAN
NONE	6.00	5.75	5.87
BENOMYL	5.92	5.65	5.78
MEAN	5.96	5.70	5.83

RFNGTIME IRRIGATN	DOUBLE	QUADRUP	MEAN
0	5.28	5.99	5.63
I	6.02	6.03	6.03
MEAN	5.65	6.01	5.83

RFNGTIME C S FUNG	DOUBLE	QUADRUP	MEAN
NONE	5.57	6.18	5.87
BENOMYL	5.73	5.84	5.78
MEAN	5.65	6.01	5.83

https://doi.org/10.23637/ERADOC-1-19 *pp 22*

85/R/BE/11

GRAIN TONNES/HECTARE

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

RFNGTIME	DOUBLE	QUADRUP	MEAN
RUSTFUNG			
MAN+MANC	5.77	6.15	5.96
PROPICON	5.53	5.87	5.70
MEAN	5.65	6.01	5.83

C S FUNG	NONE		BENOMYL	
RUSTFUNG	MAN+MANC	PROPICON	MAN+MANC	PROPICON
IRRIGATN				
0	6.11	5.50	5.94	4.98
I	5.89	6.00	5.89	6.33

C S FUNG	NONE		BENOMYL	
RFNGTIME	DOUBLE	QUADRUP	DOUBLE	QUADRUP
IRRIGATN				
0	5.47	6.14	5.08	5.84
I	5.68	6.22	6.37	5.85

RUSTFUNG	MAN+MANC		PROPICON	
RFNGTIME	DOUBLE	QUADRUP	DOUBLE	QUADRUP
IRRIGATN				
0	5.85	6.20	4.70	5.78
I	5.68	6.10	6.36	5.97

RUSTFUNG	MAN+MANC		PROPICON	
RFNGTIME	DOUBLE	QUADRUP	DOUBLE	QUADRUP
C S FUNG				
NONE	5.56	6.44	5.58	5.92
BENOMYL	5.97	5.86	5.48	5.83

	RUSTFUNG	MAN+MANC		PROPICON	
	RFNGTIME	DOUBLE	QUADRUP	DOUBLE	QUADRUP
IRRIGATN	C S FUNG				
0	NONE	5.65	6.57	5.28	5.71
	BENOMYL	6.06	5.83	4.11	5.84
I	NONE	5.48	6.31	5.88	6.12
	BENOMYL	5.89	5.89	6.85	5.81

IRRIGATN	0	I	MEAN
EXTRA			
NONE	4.74	5.10	4.92
BENOMYL	5.00	5.22	5.11
MEAN	4.87	5.16	5.02

GRAND MEAN 5.56

https://doi.org/10.23637/ERADOC-1-19 *pp 23*

85/R/BE/11

GRAIN TONNES/HECTARE

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

TABLE	EXTRA	C S FUNG	RUSTFUNG	RFNGTIME
SED	0.265	0.188	0.188	0.188

TABLE	IRRIGATN* C S FUNG	IRRIGATN* RUSTFUNG	C S FUNG RUSTFUNG	IRRIGATN* RFNGTIME
SED	0.265	0.265	0.265	0.265

TABLE	C S FUNG RFNGTIME	RUSTFUNG RFNGTIME	IRRIGATN* EXTRA	IRRIGATN* C S FUNG RUSTFUNG
SED	0.265	0.265	0.375	0.375

TABLE	IRRIGATN* C S FUNG RFNGTIME	IRRIGATN* RUSTFUNG RFNGTIME	C S FUNG RUSTFUNG RFNGTIME	IRRIGATN* C S FUNG RUSTFUNG RFNGTIME
SED	0.377	0.375	0.375	0.531

* WITHIN THE SAME LEVEL OF IRRIGATN ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	26	0.531	9.5

GRAIN MEAN DM% 90.7

PLOT AREA HARVESTED 0.00015

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85/R/BE/12

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 VI/VII 1.

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

Design: 2 randomised blocks of 21 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments: All combinations of:-

1. RUSTFUNG — Fungicides to control rust:

BENODANI	Benodanil at 1.1 kg
FENPROP	Fenpropimorph at 0.75 kg
MANEB	Maneb at 0.80 kg
MANCOZEB	Mancozeb at 0.80 kg
MAN+MANC	Maneb at 0.80 kg plus mancozeb at 0.80 kg
PROPICON	Propiconazole at 0.12 kg
THIRAM	Thiram at 2.50 kg
TRIADIME	Triadimefon at 0.50 kg
ZIN+TRID	Zineb polyethylene thiram disulphide at 1.60 kg plus tridemorph at 0.53 kg

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

ONCE	Once on 1 July, 1985
TWICE	Twice, on 1 July, 12 Aug

plus one extra treatment:

EXTRA

NONE	No fungicides to control rust (triplicated)

NOTES: (1) All sprays were applied in 220 l.
(2) Irrigation was applied to lessen a post-flowering soil moisture deficit from 50 mm to 25 mm. This was necessary on only one occasion on 18 July, when 33 mm was applied.

Basal applications: Manures: Chalk at 2.9 t. Muriate of potash at 520 kg. Weedkillers: Glyphosate at 1.4 kg in 220 l; trietazine at 1.2 kg with simazine at 0.17 kg and paraquat at 0.40 kg ion in 220 l. Fungicide: Benomyl at 0.56 kg in 220 l. Insecticides: Deltamethrin at 0.0075 kg in 220 l on two occasions; pirimicarb at 0.14 kg in 220 l on two occasions.

Seed: Minden, sown at 220 kg.

https://doi.org/10.23637/ERADOC-1-19 *pp 25*

85/R/BE/12

Cultivations, etc.:- Chalk applied: 11 Sept, 1984. K applied: 25 Sept. Glyphosate applied: 26 Sept. Ploughed: 15 Oct. Spring-tine cultivated, seed sown: 13 Mar, 1985. Trietazine, simazine and paraquat applied: 19 Mar. Deltamethrin applied: 2 May, 23 May. Pirimicarb applied: 20 June, 17 July. Fungicide applied: 2 July. Harvested by hand: 17 Sept. Previous crops: Potatoes 1983, s. barley 1984.

NOTES: 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.

GRAIN TONNES/HECTARE

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

RFNGTIME RUSTFUNG	ONCE	TWICE	MEAN
BENODANI	6.99	6.99	6.99
FENPROP	6.92	6.80	6.86
MANEB	6.42	5.69	6.06
MANCOZEB	7.30	5.97	6.63
MAN+MANC	7.67	7.17	7.42
PROPICON	5.68	5.65	5.66
THIRAM	6.15	5.94	6.05
TRIADIME	6.51	7.28	6.90
ZIN+TRID	6.91	6.42	6.67
MEAN	6.73	6.43	6.58

EXTRA NONE 5.59

GRAND MEAN 6.44

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

TABLE	RUSTFUNG	RFNGTIME	RUSTFUNG RFNGTIME
SED	0.524	0.247	0.741

SED FOR COMPARING EXTRA NONE WITH ANY ITEM
IN RUSTFUNG.RFNGTIME TABLE IS 0.605

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

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.741	11.5

GRAIN MEAN DM% 88.1

PLOT AREA HARVESTED 0.00015

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85/R/BE/14

SPRING BEANS

INSECT GROWTH REGULATOR

Object: To study the effects of three rates of a juvenile hormone mimic on black aphids (Aphis fabae) and on yield of spring beans - Long Hoos III 1.

Sponsors: D.C. Griffiths, J.H. Stevenson.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 2.4 x 6.0.

Treatments:

GROW REG	Rates of 'S 31183' juvenile hormone mimic:
NONE	None
S 10	10 g a.i
S 50	50 g a.i
S 250	250 g a.i

NOTE: Treatments were applied with a knapsack sprayer in 200 l on 4 July, 1985 repeated on 11 July.

Basal applications: Weedkillers: MCPB at 1.7 kg with glyphosate at 0.50 kg in 220 l. Trietazine at 1.2 kg with simazine at 0.17 kg and paraquat at 0.40 kg ion in 220 l. Insecticide: Permethrin at 0.052 kg in 220 l.

Seed: Minden, sown at 220 kg.

Cultivations, etc.:- MCPB and glyphosate applied: 29 Aug, 1984. Ploughed: 15 Nov. Spring-tine cultivated: 12 Mar, 1985. Seed sown: 13 Mar. Trietazine, simazine and paraquat applied: 18 Mar. Insecticide applied: 23 May. Combine harvested: 23 Sept. Previous crops: W. oats 1983, w. wheat 1984.

NOTE: Estimates of aphid populations were made on seven occasions during the season.

https://doi.org/10.23637/ERADOC-1-19 *pp 27*

85/R/BE/14

GRAIN TONNES/HECTARE

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

GROW REG	NONE	S 10	S 50	S 250	MEAN
	3.65	3.60	3.79	3.64	3.67

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

TABLE	GROW REG
SED	0.124

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

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.176	4.8

GRAIN MEAN DM% 83.5

PLOT AREA HARVESTED 0.00086

https://doi.org/10.23637/ERADOC-1-19 *pp 28*