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84/R/BE/16 Control of Rust - S. Beans

Rothamsted Research

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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.

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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

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

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

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

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

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GRAIN TONNES/HECTARE

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

IRRIGATN	C S FUNG	RUSTFUNG	MAN+MANC	PROPICON	
		RFNGTIME	ONCE	TWICE	ONCE
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	NONE	BENOMYL	MEAN		
IRRIGATN					
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		