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80/W/PH/2 *Phaseolus Rhizobium* Strains

Rothamsted Research

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80/W/PH/2

PHASEOLUS

RHIZOBIUM STRAINS

Object: To study the effects of a range of strains of *Rhizobium phaseoli* on nodulation and yield of *Phaseolus vulgaris* - Gt. Hill III.

Sponsor: J.M. Day.

Design: 4 randomised blocks of 20 plots.

Whole plot dimensions: 1.90 x 3.96.

Treatments:

RHIZOB N	Rhizobium strains and nitrogen fertiliser:
R0 NO	No inoculum, no nitrogen (duplicated)
R0 N40	" " , 40 kg N to seedbed
R0 N80	" " , 80 " " " "
R0 N120	" " , 120 " " " "
R1 NO	Rhizobium strain CIAT 127, no nitrogen
R2 NO	" " CIAT 166, " "
R3 NO	" " CIAT 407, " "
R4 NO	" " CIAT 255, " "
R5 NO	" " CIAT 161, " "
R6 NO	" " CIAT 727, " "
R7 NO	" " CIAT 57, " "
R8 NO	" " CIAT 390, " "
R9 NO	" " CIAT 904, " "
R10 NO	" " CIAT 952, " "
R11 NO	" " RC 3644, " "
R12 NO	" " RC 3622, " "
R13 NO	" " RC 963A, " "
R14 NO	" " RC 3608, " "
RA NO	All 14 Rhizobium strains mixed, no nitrogen

Basal applications: Manures: Magnesian limestone at 7.5 t (0:14:28) at 340 kg. Weedkillers: Carbetamide (as 'Carbetamex' at 3.1 kg) in 280 l. Bentazone (as 'Basagran' at 2.9 l) with spray additive (as 'Actipron' at 2.0 l) in 280 l.

Seed: Longbow, sown at 250,000 seeds per hectare.

Cultivations, etc.: Magnesian limestone applied: 29 Sept, 1979. Ploughed: 20 Oct. Spring-tine cultivated, field bean seed sown: 23-24 Oct. 'Carbetamex' applied: 2 Nov. Field beans ploughed in: 12 Feb, 1980. Heavy spring-tine cultivated, PK applied, rotary cultivated: 11 Apr. Spring-tine cultivated: 19 May. Ridged up: 20 May. Seed sown by hand: 21 May. 'Basagran' with 'Actipron' applied: 27 June. Harvested by hand: 30 Sept. Previous crops: Potatoes 1978, w. wheat 1979.

NOTE: One block and one plot in another block with treatment R0 NO were abandoned because of many grass weeds. An estimated value for the missing plot was used in the analysis.

80/W/PH/2

GRAIN TONNES/HECTARE

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

RHIZOB N	
RO NO	1.11
RO N40	1.42
RO N80	1.92
RO N120	1.87
R1 NO	2.05
R2 NO	2.29
R3 NO	2.28
R4 NO	1.48
R5 NO	1.86
R6 NO	2.00
R7 NO	1.19
R8 NO	1.46
R9 NO	2.49
R10 NO	2.22
R11 NO	2.13
R12 NO	1.79
R13 NO	1.74
R14 NO	1.86
RA NO	1.75
MEAN	1.80

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

TABLE	RHIZOB N

SED	0.307 MIN REP
	0.266 MAX-MIN
	RHIZOB N
MAX-MIN RO NO V ANY OF THE REMAINDER	
MIN REP ANY OF THE REMAINDER	

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

STRATUM	DF	SE	CV%
BLOCK.WP	38	0.376	20.9
PLOT AREA HARVESTED	0.00167		