EFFECT OF ROW SPACING AND PLANT GROWTH HABIT ON SEVERITY OF WHITE MOLD DISEASE OF DRY BEANS CAUSED BY SCLEROTINIA SCLEROTIORUM

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Field observations have suggested that decreasing plant density and a more determinate type of plant may reduce the severity of white mold disease on dry beans. A split plot design located at the Scotts Bluff Experiment Station was utilized in 1972 to study six bean varieties and lines at 30, 20 and 10 inch row spacings. The varieties were four viny types, GN #1140, GN Nebr. #1, GN Nebr. #1 sel. 27, and near-isogenic GN Nebr. #1 sel. 27, and two near-isogenic determinate lines of GN Nebr. #1 and GN Nebr. #1 sel. 27. These near-isogenic lines were developed by D. P. Coyne and used in this experiment to study the effect of changes in plant architecture and canopy on yield under different row spacings. These results will be reported later. The presence of natural inoculum and favorable weather conditions resulted in moderate overall disease in the plot. The seed was planted on June 1, and disease ratings were taken on August 26. Because of variation in row spacing, flood rather than furrow irrigation was applied as needed.

The disease ratings on all varieties were significantly higher (using Duncan's multiple range test) in the 10 inch than in the 30 inch row spacings. The determinate GN Nebraska #1 line exhibited a lower disease rating over all the spacings than did the standard viny variety GN #1140. The other determinate line also tended to have a lower disease rating over all the spacings. GN Nebraska #1 selection 27 (early) is a semi-viny type of bean and at 30 inch row spacing had a significantly lower disease rating. At close spacings, however, this variety had as much or more white mold than the standard variety GN #1140. These results indicate that a determinate bean plant offers a means of reducing the amount of disease resulting from infection by Sclerotinia sclerotiorum.

Table 1. White mold disease ratings[1] of six dry bean varieties and near-isogenic lines at 10, 20 and 30 inch row spacings.

Varieties	Spacing (in.) 10	20	30	Variety mean
GN Nebraska #1 (Indet)	2.0[2]	1.8	1.4	1.7
Near-Isogenic Determinate GN Nebraska #1	1.6	1.0	1.0	1.2
GN Nebraska #1 selection 27 (Indet)	2.2	1.6	1.4	1.7
Near-Isogenic Determinate GN Nebraska #1 selection 27	1.6	1.4	1.2	1.4
Near-Isogenic early GN Nebraska #1 selection 27 (Indet)	2.4	2.0	1.0	1.8
GN #1140 (Indet)	2.4	1.6	1.6	1.9
Spacing mean	2.0	1.6	1.3	

[1]Rating system:

	% disease
1=	1-5
2=	6-25
3=	26-60
4=	61-80
5=	81-100

Ratings were conservative in that only plants showing signs of Sclerotinia sclerotiorum were determined to be diseased.

[2]Each numerical rating is an average of five replicates. One replicate contained 180-200 plants.

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EVALUATION OF PLANT INTRODUCTION LINES OF PHASEOLUS VULGARIS FOR ROOT ROT DISEASE REACTION AND OTHER CHARACTERISTICS

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Seeds of 32 plant introduction lines were planted in single rows 8-15 feet long on June 2, 1972, at the Scotts Bluff Experiment Station. The plot location had a previous history of root rot (Fusarium solani f. sp. phaseoli). Evaluations were made on August 17. The table below lists those lines which showed the most tolerance to root rot along with some standard varieties.

Entry	Root rot rating[1]	Common blight rating[2]	Habit	Maturity	Seed color
201 378	1.2	3.0	Viny	Late	Dark
201 380	1.1	2.0	Viny	Late	Dark
165 435	1.3	5.0	Viny	Late	Dark
203 958	1.0	3.0	Viny	Very late	---
325 638	1.1	2.0	Viny	Late	Colored
325 619	1.1	2.0	Viny	Very late	---
269 207	1.0	2.0	Semi-viny	Late	---
325 641	1.0	2.0	Viny	Very late	---
325 597	0.7	2.0	Viny	Very late	Colored
325 596	1.0	1.2	Viny	Very late	---
325 593	0.8	1.5	Viny	Late	---
325 594	0.8	2.0	Viny	Late	---
325 524	0.8	2.0	Viny	Late	---
325 605	0.8	2.0	Viny	Late	---
Great Northern #59	2.7	4.0	Viny	Early	White
Pinto UI 111	2.6	4.2	Viny	Early	Colored

[1]Root rot rating: 0=no root infection; 5=root and hypocotyl tissue destroyed.
[2]Common Blight rating: 0=no blight; 5=all leaves with blight infection.

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