

INFLUENCE OF PLANT AGE, INOCULATION METHOD AND SCORING DATA ON REACTION OF BEANS TO XANTHOMONAS COMPESTRIS PV. PHASEOLI

by

M.S.Musaana, O.D. Mwandemele and H. Gridley

Three experiments were conducted in the screenhouse using the varieties K20, IAPAR16 and GN-Jules. The stems were inoculated at V_1 (germination) by the stem stab method (Arp, et al, 1971) and evaluated 40 days after. Leaves were inoculated from V_2 (primary leaf stage) to R_8 (pod filling) by razor blade (Coyne and Schuster, 1974) (RB) and multiple needle (MN) (Coyne Schuster, 1974) methods and evaluated 10 and 15 days after inoculation. Pods were inoculated by pod scratch (Coyne Schuster, 1974) and evaluated 15 days after. Correlations were calculated between seedling and adult plant resistance, different inoculation methods and scoring dates.

The results indicated that there is no relationship between seedling (V_1 = stem to V_3 = 1st trifoliolate leaf stage) and adult plant resistance (R_6 to R_8 and pods). Exceptions were MN was used and score taken 15 days after (r). The RB method, applied at seedling and pod stage (r). Stem and pod resistances, were correlated ($r=0.75$). The RB and MN methods were highly correlated when scores were taken at the same growth stage and at the same number of days after inoculation (table 1). Scores taken 10 and 15 days after inoculation were highly correlated when taken on the same growth stage and inoculation method.

The results indicated that RB and MN methods could be substituted for each other and the scores can be taken 10 or 15 days after inoculation. It is also necessary to evaluate seedling resistance separately from adult plant resistance. This could be due to pleiotrophy of the genes that control bean resistance to common blight in seedlings.

Pod and stem resistance apparently is controlled by a set of genes which differs from that controlling leaf resistance.

Reference

- Arp G. J; Coyne, D. P and M. C. Schuster, 1971. Disease reaction of bean varieties to Xanthomonas phaseoli var fuscans using two inoculation methods. PI. Dis. Repr. 55 (7):577-579.
- Coyne, D. P and M. L Schuster, 1974. Differential reaction of pods and foliage of beans (Phaseolus vulgaris) to Xantomonas phaseoli. Pl. Dis. Repr. 58(3):278-282.

Table 1. Correlation matrix for different inoculation methods at different growth stages.

	RBs10	MNs10	RBs15	MNs15	RBa10	MNa10	RBa15	MNa15	STEM
MNs10	0.42*								
RBs15	0.84**	0.55*							
MNs15	0.86**	0.64**	0.92**						
RBa10	-0.07	0.03	0.07	-0.02					
MNa10	-0.32	-0.14	-0.20	-0.28	0.89**				
RBa15	-0.13	0.03	-0.05	-0.11	0.87**	0.81**			
MNa15	-0.31	-0.06	-0.19	-0.29	0.79**	0.90**	0.76**		
STEM	0.30	0.14	0.25	0.39	-0.30	-0.50	-0.23	-0.46*	
PODS	0.64**	0.13	0.54	0.62**	-0.00	-0.25	0.04	-0.29	0.75**

RB = inoculation by razor blade and MN = inoculation by multiple needle (florist frog)

S = seedling and a = adult plant, 10 and 15 = scores taken 10 and 15 days after inoculation, respectively

* and ** = significant at 5% and 1% probability levels, respectively