

REACTION OF SELECTED MEXICAN AND USA BEAN LINES TO
FUSARIUM OXYSPORUM F. SP. PHASEOLI

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INTRODUCTION

Fusarium wilt, caused by Fusarium oxysporum f. sp. phaseoli Kendrick and Snyder (FOP), is a widespread soil borne disease of common beans (Phaseolus vulgaris L.). Outbreaks of this disease have been reported from several Latin American and African countries (Abawi and Pastor-Corrales, 1990). The management of Fusarium wilt includes the use of cultural and chemical practices that may have variable impact on disease severity. The most practical and economical measure to manage this disease is the use of resistant varieties. Resistance to FOP in different bean species and commercial types such as tepary (Phaseolus acutifolius Gray), pinto and snap beans has been previously reported (Ribeiro and Hagedorn, 1979; Salgado and Schwartz, 1993; Salgado et al., 1994). The present study was carried out to identify new potential sources of resistance to the FOP isolate from Colorado (FOP-CO1) in selected bean lines from Zacatecas, Mexico as well as from the USA under greenhouse conditions.

MATERIALS AND METHODS

Inoculum of ATCC 90245 culture (FOP-CO1) was derived from a single-spore macroconidium stock culture grown in cultures tubes containing potato-dextrose agar (PDA), and stored at 4 C until use. Transferences from the stock cultures were made onto petri dishes containing PDA and incubated in the dark for 16 -18 days at 26 +/- 1 C. Conidia were suspended in sterile distilled water and inoculum concentration was adjusted to 10⁴, 10⁵ and 10⁶ conidia per ml of distilled water. Plants of 19 bean lines from Zacatecas, Mex. (provided by Hector Perez-Trujillo, INIFAP-Zacatecas) and 6 bean lines from the USA were inoculated following the inoculation technique described by Salgado and Schwartz (1993). Pinto UI - 114 was included as a susceptible check. External symptoms were rated 21 days after inoculation according to the CIAT severity scale of 1 (no visible symptoms) to 9 (plant foliage 100 % wilted, chlorotic or dead). An average disease severity of 1-3 indicated a resistant, 3.1-6 an intermediate and 6.1-9 a susceptible reaction class.

RESULTS AND DISCUSSION

In most cases Fusarium wilt severity increased as the inoculum concentration was increased. In a few cases, the severity was higher at low inoculum concentrations (10⁴ and 10⁵) than at the high inoculum concentration (10⁶), suggesting the action of environmental factors not under control in the test. The CSU pinto bean lines CO 33142 and CO 59196 showed a resistant reaction at all inoculum concentrations included in the experiment, which agrees with previous observations (Salgado et al., 1992). The bean line MAM 38 from Zacatecas showed satisfactory levels of resistance at all inoculum concentrations tested. Other lines from Zacatecas with promising levels of resistance at low inoculum concentrations were Pinto Villa and (PF x BZ)A 263. The CSU medium red, mottled bean line CO 97373 had a resistant reaction at low inoculum concentration, however, showed an intermediate reaction as the inoculum concentration was higher. It is suggested that lines showing resistance at any inoculum concentration should be evaluated again.

Reaction of selected bean lines from Zacatecas, Mex. and USA to *Fusarium oxysporum* f. sp. *phaseoli* (FOP-CO1).

Bean line	Inoculum concentration		
	10 ⁴	10 ⁵	10 ⁶
Zacatecas:			
Manzano	4.8 I*	6.2 S	6.7 S
Pinto Villa	2.4 R	4.5 I	5.3 I
Negro Zacatecas	6.1 S	7.9 S	8.1 S
Pinto Chihuahua	4.1 I	5.3 I	4.4 I
Flor de Mayo 9	3.2 I	5.8 I	8.0 S
(G x RG) x V8025	4.3 I	5.6 I	6.3 S
Flor de Mayo 11	4.2 I	5.4 I	6.4 S
BB x II 952-M26	6.9 S	8.3 S	8.9 S
(PF x BZ) A 263	2.9 R	3.5 I	6.0 I
G 3689 x Apet.	3.6 I	3.4 I	3.8 I
Flor de Mayo 19	4.4 I	6.2 S	5.0 I
MAM 38	1.9 R	1.7 R	2.7 R
Flor de Mayo Compuesto	5.4 I	5.2 I	6.5 S
Flor de Mayo Criollo	4.7 I	5.4 I	7.4 S
Bayo Zacatecas I	5.3 I	6.5 S	5.9 I
Bayo Zacatecas II	4.0 I	7.0 S	7.9 S
Flor de Mayo Sol	3.9 I	6.6 S	7.3 S
Flor de Mayo Comun	5.2 I	6.8 S	5.2 I
Garbancillo Supremo	4.1 I	5.0 I	5.9 I
USA:			
Chase	5.2 I	7.2 S	8.2 S
CO 59196	1.2 R	1.1 R	1.7 R
CO 33142	2.1 R	2.6 R	2.3 R
CO 97373	2.9 R	4.4 I	5.0 I
Hatton	3.2 I	3.0 I	4.6 I
88-048-03	4.9 I	4.6 I	7.5 S
Pinto UI-114 (Check)	8.2 S	8.9 S	8.9 S

* R: Resistant, I: Intermediate, S: Susceptible Reaction. Means of 8 - 20 plants/entry/inoculum rate.

LITERATURE CITED

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