

REACTION OF COMMON BEAN LINES TO *PSEUDOCERCOSPORA GRISEOLA* IN DIFFERENT ENVIRONMENTAL CONDITIONS

Rafael Pereira¹, Elaine A. de Souza¹, Larissa C. Costa¹ and Ângela F.B. Abreu²

¹Universidade Federal de Lavras (UFLA), CEP 37200-000, Lavras, MG - Brazil

²Embrapa Arroz e Feijão, Santo Antônio de Goiás, GO, Brazil
easouza@dbi.ufla.br

INTRODUCTION

Angular leaf spot (ALS) in common bean (*Phaseolus vulgaris* L.) caused by fungus *Pseudocercospora griseola* is one of the main diseases that affects the crop. This disease mainly infects leaves and pods, inducing premature leaf dropping and consequently reduction in grain quality (Mahuku et al., 2009). Losses in grain yield caused by ALS can reach 80% (Singh and Schwartz, 2010). The use of resistant cultivars is one of the most efficient methods to control this disease. Evaluation of common bean lines reaction to *P. griseola* is important to identify new resistance sources that can be used in common bean breeding program. Furthermore, to determine the best environment condition for this evaluation is a challenge. Therefore, this study aimed to compare the reaction of common bean lines to *P. griseola* in different environmental conditions.

MATERIAL AND METHODS

Two experiments were conducted, one in field and other one in greenhouse to evaluate the ALS severity in 144 common bean genotypes, cultivars and lines, using artificial inoculation of *P. griseola*. Experimental design was a triple lattice 12x12 and the plot size was two rows of one-meter and sowing on February in dry season. Randomized block design with three replications was used to evaluate the same common bean genotypes in greenhouse. Plot consisted of a pot which four seeds were sown. Mixture *P. griseola* strains, races 63.23 and 63.63, was used for artificial inoculation in both environment conditions. Each strain was cultivated in leaf dextrose agar medium and incubated at 24°C for 14 days with 12 hours of photoperiod. Concentration of conidia was adjusted to 2×10^4 conidia mL⁻¹. Plants in V3 stage were inoculated and remained in greenhouse with relative humidity of 80% and temperature of 24°C. After 14 days of inoculation was evaluated ALS severity of plants according to the descriptive scale 1-9, developed by Pastor-Corrales and Jara (1995). Artificial inoculation on plants in field was carried three times from the V3 stage and ALS severity was evaluated at 33 days after flowering using the same scale (Rezende et al. 2015). Plants scoring between 1 and 3 were considered resistant and higher 3, susceptible. The severity data were submitted to analysis of variance using the GENES software.

RESULTS AND DISCUSSION

Of the 144 genotypes evaluated, only 9 and 12 were resistant to *P. griseola* in greenhouse and field, respectively (Table 1) showing the difficulty of identifying common bean genotypes with high resistance to ALS. Furthermore, it was observed that in general, the genotypes behavior was not consistent in the two environment conditions evaluated. Low coincidence should have occurred due to temperature and humidity conditions that are not controlled in field. Another point is the natural pathogen occurrence in field that is responsible for the presence of other pathogen races. It is expected that common bean lines identified as resistant in greenhouse present different reaction to ALS under field conditions. Interestingly, the most of resistant

common bean lines (acronym MA) in both environments are derived from a recurrent selection program for ALS. These data corroborate with results commonly found in the literature (Pereira et al., 2015). This recurrent selection program used 17 genotypes for the establishment of the population base and, among those, ten are recognizable resistance sources to ALS.(AN512561, AND-277, Ouro Negro, Campuesto Negro Chimaltenango, CAL143, MAR-2, MAR-1, G5686, MA4.137, and Jalo) (Amaro et al., 2007). In general, all common bean lines derived from different cycles of this program exhibited a good level of resistance to the *P. griseola*, proving that recurrent selection has been efficient in obtaining resistant lines to ALS. The common bean line MAIV-15.524 exhibited the lowest scores for the severity of ALS in both environments. Thus, this line is a possible source of resistance to be used in breeding programs, with a view toward resistance to ALS.

Table 1 Mean scores (1 = minimum, 9 = maximum) of ALS severity of common bean lines more resistant in field and greenhouse.

Elite line/cultivar	Scores (Greenhouse)	Elite line/cultivar	Scores (Field)
MAII-8	2.9	MAIII-16.155	2.3
PT 65	2.8	MAI-18.13	2.0
VC 28	2.8	MAVIII-128	2.7
MAIV-8.102	2.8	MAII-10	2.7
MAIV-15.204	2.8	MAVII-244	1.3
MAIX-4	2.7	MAIII-9.91	2.6
RC2 RAD 155	2.6	CNFC 10432	2.8
MAIV-15.524	2.4	BRS NOTÁVEL	2.6
BRS RADIANTE	1.7	VC 17	2.3
-		MAV-1.7	3.0
-		MAIV-15.524	2.6
-		RPCVIII 7	2.4
Check-1 BRSMG Talismã	4.8	Check-1 BRSMG Talismã	5.2
Check-2 BRSMG Majestoso	4.7	Check-2 BRSMG Majestoso	4.3
Check-3 BRSMG Madrepérola	4.6	Check-3 BRSMG Madrepérola	4.7

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