IDENTIFICATION OF COMMON BEAN RESISTANT SOURCES TO ANGULAR LEAF SPOT DISEASE IN A BRAZILIAN GERMPLASM COLLECTION

P.F. Pádua[1]; Q.L. Barcelos[2], E.A. Souza[1], A.F.B. Abreu[3]

[1]Universidade Federal de Lavras, Lavras, MG – Brazil,
[2]Universidade Federal do Mato Grosso, Sinop, MT – Brazil,
[3] Embrapa Arroz e Feijão, Santo Antônio de Goiás, GO, Brazil
easouza@dbi.ufla.br

INTRODUCTION

Angular leaf spot disease caused by *Pseudocercospora griseola* is one of the most important diseases of the canopy of common bean, occurring in most places where the crop is cultivated (MODA-CIRINO et al., 2012). Although the frequent use of fungicides common bean crop, the most economically viable alternative to control disease is the use of resistant cultivars. The germplasm collection of the Universidade Federal de Lavras has about 888 entries and its origins are genotypes developed by different breeding programs, collected in productions areas and other countries. The common bean breeding program from the University conduces a recurrent selection program to grain yield and angular leaf spot resistance since 1980. The aim of this study was to identify sources of resistance in the germplasm collection providing information of potential sources of resistance to introduce in breeding programs.

MATERIAL AND METHODS

A group of 209 common bean genotypes from the germplasm collection of the Universidade Federal de Lavras (UFLA), Minas Gerais State, Brazil where evaluated. The race 63-63 of *P. griseola* is one of the most frequent races in Brazil (SILVA et al.2008; PEREIRA et al. 2015) and was used in all inoculations. Pathogenicity tests were conducted using the inoculation in early plant stages as proposed by Pereira et al. (2011). Mycelial plugs were inoculated in leaf-dextrose-agar medium and incubated at 24ºC for seven days in the dark to producing spores. Spore solutions were made by harvesting in sterile water and the concentration adjusted to 2×10^4 spores/mL. Nine seeds of each cultivar were sown in a polystyrene tray of 162 cells with Multiplant® substrate. Two replicate trays were used totalizing 18 seeds of each cultivar. The cultivars Rosinha and the inbred line MAI-18-13 were used as susceptible and resistant controls, respectively. When seedlings had fully expanded primary leaves the spore suspension was sprayed and trays were maintained in the greenhouse at 24ºC and 85% humidity for 14 days when evaluations were performed. Scale from 1 to 9 developed by Librelon et al. (2015) was used to evaluate plant symptoms. Average scores were estimated and scores below 3 were considered as resistant, whereas plants scoring more than 3 were susceptible

RESULTS AND DISCUSSION

The germplasm collection from the breeding program at UFLA has about 888 entries. In this work we evaluated the reaction of 209 inbred lines using the 63-63 race of *P. griseola*. The reaction of the evaluated lines showed different levels of resistance to race 63-63. Figure 1 shows that 54(26%) lines were identified as resistant and 155(74%) as susceptible.

This result demonstrates the severity of the disease and the importance of obtaining resistant cultivars. Recurrent selection breeding method allows the introduction of new genotypes and among the lines evaluated have been identified potential sources of resistance that can be employed directly in the breeding program.
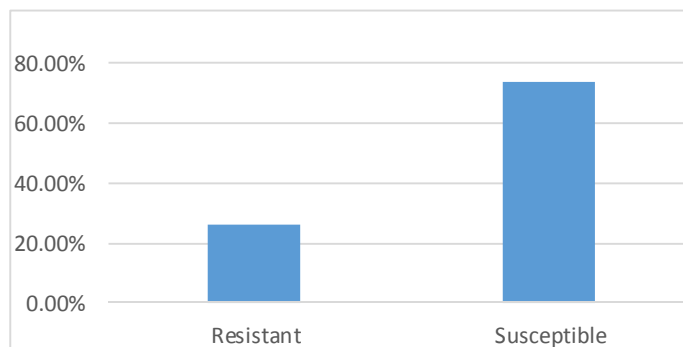
Figure 1. Percentages of resistant and susceptible common bean inbred lines to 63-63 race of *P. griseola*.

The evaluation of resistance to angular leaf spot has been carried out in germplasm collections in of different research institutions in Brazil (MODA-CIRINO et al., 2012) identifying about 14% of resistantant lines. Most of the evaluations were conducted under field condictions depending of the natural occurrence of the pathogen. Evaluations performed at the Universidade Federal de Viçosa found three lines (MAI-18-13, VC16 and Vermelhão) resistant in both field and greenhouse evaluations, therefore considered as sources of resistance to breeding programs (MODA-CIRINO et al., 2012). Interestingly, the resistant line MAI-18-13 has origins in the recurrent selection program from UFLA. Moreover, in the present work were identified 26% of resistant lines and seven were obtained from the recurrent selection program showing its efficiency to improve resistance to angular leaf spot disease.

REFERENCES
Librelon, S. S. et al. Australasian Plant Pathology, p. 1-11, 2015.
Moda-Cirino, V. et al. In: Paula Júnior, T. J., Wendland, A. p. 71-80, 2012.
Pereira, R. et al. Genetics And Molecular Research**,** p. 5044-5053, 2015.
Pereira, R. et al. Annual Report of the Bean Improvement Cooperative, v. 54, p. 104-105, 2011.
Silva, K.J.D. et al. Journal of Phytopathology, v.156: 602-606, 2008.