Tropentag, September 19-21, 2012, Göttingen - Kassel/Witzenhausen

"Resilience of agricultural systems against crises"

Lines from Brazilian Dry Bean Breeding Programs with White Mold Resistance

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Abstract

Dry bean lines developed for the State of Minas Gerais (MG), Brazil, are tested every year at several locations, but generally without white mold (WM) pressure. The experiments installed to test these lines are called "cultivation and use value" (VCU). Our hypothesis is that among the lines included in the VCUs there are some with levels of WM resistance higher than those of the current cultivars. Lines/cultivars tested in the VCUs conducted in 2008, 2009, and 2010 were assessed for their reaction to WM and yield in an area naturally infested with sclerotia, in Oratórios, MG. Based on the results obtained in the VCUs, seven lines (VC 17, VP 21, CNFC 10720, CNFC 10722, CNFP 10798, CNFP 11980, and CNFC 11965) and the cultivars BRS Vereda and Ouro Branco were selected. In a separate experiment, the reactions of these lines/cultivars to WM were compared with the reactions of the following current cultivars: Pérola, BRSMG Majestoso, Ouro Negro, and Ouro Vermelho. The line A 195, which is known for its WM resistance, was also included for comparison. White mold intensity (incidence + severity) was evaluated visually, using a 1-to-9 scale. Yield varied from 907 to 2716 kg ha^{-1}. Significant correlations were observed between WM intensity and yield (r = -0.69***) and WM intensity and lodging (r = 0.56***). Six lines, two of them of type III, were ranked in the group with the highest yield. WM intensity of these lines varied from 4.2 to 5.6. These VW intensities were similar to that verified for the line A 195. On the other hand, three current cultivars were ranked in the group with the lowest yield. WM intensities of these cultivars varied from 6.3 to 7.5. These results indicate that advanced breeding lines should be tested under WM pressure before being released as a new cultivar. They also suggest that good source of resistance to WM are present in the lines and cultivars of dry beanCultivars/lines with resistance to WM might require fewer fungicide applications than current cultivars.

Keywords: Common beans, integrated management, *Phaseolus vulgaris*, *Sclerotinia sclerotiorum*

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