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Effectiveness of a seed plate assay evaluating charcoal rot resistance in soybean
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Charcoal Rot (*Macrophomina phaseolina*) of soybean (*Glycine max* (L.) is a disease of economic significance in the United States. While there is moderate host resistance in soybean cultivars, identifying and quantifying the resistance is difficult. Current assay methods, such as greenhouse based cut-stem inoculation and field evaluations using colony-forming unit index (CFUI), can be time consuming, and data may vary between tests. The objectives of this research were to develop a reproducible seed plate assay for Charcoal rot resistance by comparing results with cut-stem and CFUI assays, and correlate and compare field data disease assessments PHSD, RSS and CFUs with seed plate assay on different genotypes. In the first experiment, ten surface disinfested seeds of eight differential soybean genotypes that include earlier described 3 sensitive and 5 resistant cultivars were placed on water agar plates that had been inoculated with an isolate of *M. phaseolina* five days before. Plates were incubated at room temperature in the dark for 7 days and the number of germinated seeds determined, compared to non-inoculated plates that served as controls. In the second experiment, nineteen differential soybean genotypes were used to assess disease resistance to *M.*

phaseolina, using the same methodology for the first experiment, and results were correlated with field disease assessments data from Rohwer and Stuttgart, AR.

Germination results from the plate assay were in agreement with the cut-stem and CFUI assays, although none of the genotypes evaluated in the plate assay showed complete resistance to *M. phaseolina*. However, data from the plate assay could quantitatively separate genotypes in different degrees of resistance and susceptibility, as showed in previous reports. PHSD disease assessment was significant correlated with PA between years and locations. RSS was significant correlated in Rohwer for 2012, and CFUs significant correlated only in Stuttgart for 2012.