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Reaction of common bean genotypes to plant parasitic nematodes

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Abstract

Brazil is the world's largest producer of common bean (*Phaseolus vulgaris* L.), a basic dietary protein food source in the diet of the Brazilian. The consumer choice regarding grain colour, grain type, and culinary quality varies regionally, being the carioca grains (pinto bean) the type that dominates 70 % of the common bean market. The use of resistant cultivars is the most efficient strategy to control the nematode population, besides being appropriate to the producer. Nevertheless, few common bean genotypes that could serve as sources of resistance to nematodes have been identified in Brazil. These strategies being frequently the easiest and least expensive approach that can be adopted by farmers. However, in the case of the common bean in Brazil, few sources of resistance have been identified so far. Thus, this study was conducted to assess the reaction of 81 common bean genotypes to the most abundant and harmful plant parasitic nematode species in Brazilian crop fields: *Meloidogyne incognita* race 3, *Meloidogyne javanica*, *Pratylenchus brachyurus*, and *Heterodera glycines* race 3. We evaluated the reactions of the genotypes to the nematode species individually, by computing their relative reproduction rates to a susceptibility standard, and collectively by applying the Tukey's multiple comparison test on the means of nematodes recovered. We found genotypes resistant to all tested nematodes: 7 were classified as resistant to *Heterodera glycines* (BRS Esteio, BRS Notável, BRSMG Majestoso, BRSMG Pioneiro, CNFC11954, CNFP10103, Xamego), 15 to *Meloidogyne incognita* (Aporé, BRS Embaixador, BRS Esplendor, BRS Grafite, BRS Notável, BRS Requite, BRSMG Majestoso, BRSMG Pioneiro, CNFC 10762, CNFC 11954, CNFP 11984, IAC Alvorada, IPR Eldorado, RP 1, Rudá) and 8 to *Meloidogyne javanica* (Aporé, BRS Esteio, BRS Pontal, BRS Requite, BRSMG Talismã, CNFC 10762, CNFP 10103, CNFP 10794) and 2 found to be resistant to *Pratylenchus brachyurus* (IPR Tangará and Light Red Kidney). The high amount of genotypes evaluated and the uniformity of experimental conditions allowed a solid base for the development of insightful discussions on the aspects involving statistical analysis of nematode data, possible sources of resistance, and the multiplication rates of important nematodes on common bean genotypes.

Keywords: Cyst-nematodes, genetic resistance, *Phaseolus vulgaris*, root-knot nematodes, root-lesion nematodes, soybean