

Summary

The effect of the interaction of phosphorus (P), arbuscular mycorrhizal fungi, and nitrogen (N) on several microbiological parameters of *Brachiaria brizantha* cv. MG-4 and *Arachis pintoi* cv. Amarillo, intercropped in low-fertility soils, was studied under greenhouse conditions. A completely randomized block design, in a 5 x 2 x 2 factorial arrangement, was used. Treatments consisted of five doses of P (25, 50, 75, 100, and 200 mg/kg soil), two inoculation treatments (inoculated with *Glomus etunicatum* and non-inoculated), and two N treatments (with and without N). Complete fertilization with micronutrients was applied at planting and inoculum applied to the soil (7 ml/pot). Three cuttings were performed, the first 60 days after planting and the others at 45-day intervals. Mycorrhizal colonization was evaluated in root samples taken at the last cutting. Spore density decreased in the soil ($P < 0.01$) with increasing P doses. The application of P together with mycorrhiza inoculation, increased the node size and weight in *A. pintoi*. The application of N, however, adversely affected spore density in the soil, but not colonization.