

Summary

The response of *Arachis pintoi* to phosphorus (P) and lime was studied in a dark-red Latosol from Sete Lagoas, Minas Gerais, Brazil. The trial aimed to stabilize the critical level of P fertilization under controlled greenhouse conditions, using pots with 3 kg of soil. Composite treatments were applied consisting of five levels of P, four levels of lime, and two harvests. At harvest, *Arachis* production was higher in P treatments compared with lime treatments. It was possible to determine the type of P response based on the fixed regression between *Arachis* dry matter content and available P Mehlich-1, indicating that the critical P level was 9 mg/kg. No significant interaction was found between P and lime treatments. With the maximum P content in leaves (0.18 dag/kg), it was possible to stabilize the preliminary nutritional levels in *A. pintoi* as follows: N, -3.2 dag/kg; K, -3 dag/kg; Ca, 2.2 dag/kg; Mg, 0.6 dag/kg; Cu, 14 mg/kg; and Zn, 30 mg/kg.