

Abstract

Promiscuous soybeans are grain legumes that nodulate with diverse strains of indigenous *Bradyrhizobium* and play a significant role in biological nitrogen fixation through symbiosis. However, experiments on the potential use of promiscuous soybean varieties have recorded very low nodulation and poor nitrogen fixation probably due to ineffective native *Bradyrhizobium* isolates. Experiments were designed to investigate symbiotic nitrogen fixation of two promiscuous soybean varieties (SB8 and SB126) with indigenous *Bradyrhizobium* isolates in contrasting agroclimatic zones through greenhouse and field experiments. Inoculation of soybeans in the greenhouse had a significant ($p < 0.001$) effect on shoot and nodule dry weight. The best performing indigenous isolates RI9 and RI4 from the greenhouse study outperformed the commercial inoculant (Biofix) in symbiotic effectiveness with 119.17%, 142.35% and 101.01%, respectively. Inoculation in the field experiments showed a significant ($p < 0.0001$) increase in shoot dry weight and grain yield of promiscuous soybean. Agroclimatic zones showed significant ($p < 0.0001$) variability in above ground biomass of soybean due to inoculation. Despite the apparent promiscuity of the soybean varieties used, the response in nodulation suggests the cultivars grown under contrasting agroclimatic zones have a preference to specific *Bradyrhizobium* isolates.