

ABSTRACT

Globally, organic farming and bradyrhizobia inoculation are gaining popularity as agronomically and environmentally sound soil management strategies with great potential to alleviate declining soil fertility, maintain environmental quality and enhance soybean production. However, the role of bradyrhizobia in organic farming system is poorly understood. Field experiment was conducted to evaluate the effects of bradyrhizobia inoculation and organic farming on growth parameters and yield quality of soybean varieties: SC squire, SB19 and Gazelle. The experimental treatments included native bradyrhizobia, commercial *Bradyrhizobium japonicum*, mixture of native + commercial bradyrhizobia and uninoculated control. The experimental design was a split-split plot, with three replications. The results demonstrated significant improvement in soybean nodule dry weight (NDW), shoot dry weight (SDW) and seed dry weight (SEDW) following bradyrhizobia inoculation. Remarkably, organic farming significantly out-performed conventional systems in nodulation, SDW and SEDW. Moreover, seed nutrient content differed depending on farming system; where nitrogen, phosphorus, potassium and organic carbon were higher in organic farming. Soybean varieties differed significantly on SDW, NDW and SEDW; where SC squire performed better than SB19 and Gazelle. The results demonstrate the importance of organic farming and bradyrhizobia inoculation in enhancing soil fertility, yield production and quality, a key step towards sustainable food production.