Potential for enhancement of root growth and nodulation of soybean co-inoculated with Azospirillum and Bradyrhizobium in laboratory systems

ABSTRACT

The potential enhancement of root growth and nodulation in vegetable soybean (AGS190) was studied with application of Azospirillum brasilense (Sp7) and A. lipoferum (CCM3863) co-inoculated with two Bradyrhizobium japonicum strains (TAL102 and UPMR48). Significant root growth stimulation and nodulation were observed in Azospirillum as well as during its co-inoculation with Bradyrhizobium. Nodule formation is linked with the initiation of new roots; nodules were almost absent even in Bradyrhizobium inoculated plant due to the absence of new roots development in clipped rooted seedlings. Total root length, root number, specific root length, root dry matter, root hair development and shoot dry matter were significantly increased by Azospirillum alone and its co-inoculum. Co-inoculated plants significantly influenced the number of nodules and its fresh weight. A. brasilense seemed to perform better in root growth and nodule development compared to A. lipoferum.

Keyword: Azospirillum; Bradyrhizobium; Co-inoculation; Root growth; Nodulation