Effectiveness of Bradyrhizobium sp. inoculants on different substrates

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Abstract

The aim of this work was to establish the ideal conditions for survival and effectiveness of Bradyrhizobium sp. on alternative substrates with varying matric potentials. Diatomite, dried sugarcane vinasse, vermiculite and urban compost were used as substrates and compared to peat. Strain UMKL-58 of Bradyrhizobium sp., selected in a previous work used as inoculant. Substrates were equilibrated at water matric potentials (ψm) of -0,33, -1,0 and -3,0 bar and incubated for 240 days. Strain survival was evaluated by the plate dilution technique on days 0, 12, 30, 60, 90, 120, 150, 180, and 240 after substrate inoculation and also by plant infection using the legume cunhã (Clitoria ternatea L.). Biological nitrogen fixation as a function of the substrate was also studied. The results demonstrate that Bradyrhizobium sp. survived better in diatomite with a ψm of -3,0 bar, although at the other water potentials its behaviour was similar to that observed in peat. For all the substrates, low water content (low matric potentials) reduced survival rates and also affected the quality of the inoculum, decreasing the effectiveness of the strain.