Efficacy of different rhizobia strains with specific common beans landraces in biological nitrogen fixation

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Research Article

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Abstract:

Bean production in Tanzania barely meets half of the domestic demand because of low yield attributed to low fertility, nitrogen being the most common deficient. The use of rhizobia inoculants can substantially increase bean yields. However, less than 1% of the farming population is aware of inoculants. The aim of the study was to evaluate the efficacy of different rhizobia strains with specific common beans landraces in biological nitrogen fixation and yields. Four experiments were conducted during in a screen house

at Sokoine University of Agriculture (SUA). Two experiment consisted Leonard jar and the other two were pot experiments in which the soil used were either sterilized or unsterilized. The landraces collected were Kasuka Nywele, Msafiri and Manjano from Mbeya; Nyayo, Soya and Kachumbaa from Arusha; and Kabungu, Nyamungu and Karanga from Morogoro. Two sets of Leonard jars were arranged in completely randomized block design in triplicate and the other two pot experiments were arranged in split split plot design. Inoculants in pot experiments used were Nitro-SUA, Underwood Biostacked as commercial and native. Landrace were the main plot, soil sterilization as a sub plot and inoculants as sub sub plot replicated three times. Data were subjected to analysis of variance using GENSTAT software. Significance differences in N2 fixation were observed among all landraces in all experiments, promising results were observed from Nyayo, Nyamungu, Msafiri and Kabungu. Native rhizobia had comparable symbiotic effectiveness to commercial inoculants in unsterilized soils and vice versa in sterilized soils conditions though soil sterilization was not significant. The findings on this study provide rooms for further research especially on the promising landraces to nodulation and explore their effectiveness.

For further details, click on the following Link:
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