Effect of combined inoculation of Rhizobium with soil yeasts on nodulation, growth and yield of common bean (Phaseolus vulgaris under field condition.

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Abstract:

Two field experiments were executed during the seasons of 2012 and 2013 to test response of common bean to inoculation with rhizobia plus soil yeast strains Saccharomyce cerevisiae, Candida sake, Saccharomyces exiguous, Pichia membranifaciens and Cryptococcus lourentii. The results showed an the improvement of bean nodulation and plant growth parameters by the mixed inoculation treatments with Rhizobium plus the yeast strains. The highest improvement was recorded for yeast strain S. cerevisiae or S. exiguous. Inoculation with the yeast strain S. cerevisiae mixed with Rhizobium induced the following increases in nodule numbers, straw and seed yield: 51.94 %, 10.92 % and 16.65 % in the first season, and 50.94 %, 10.32 and 31.37 % in the second season, respectively over the inoculation with Rhizobium alone. The recorded enhancements are probably due to yeast hormonal production like indol acetic acid (IAA) on root growth and lateral roots leading to increased nodulation and nutrient uptake and subsequently increased yield. Also, by increasing mineral nutrients solubilization like phosphorous and iron.

Keywords:

common bean, Rhizobium, soil yeasts, Saccharomyce cerevisiae, nodulation

Published In:

American journal of Plant nutrition and Fertilization Technology , 4 (1) , 1-10