



PROCEEDINGS OF THE 8th WORLD CONGRESS ON CONSERVATION AGRICULTURE

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Effects of Soil bioactivation and fertilizer on common bean grain yield in Brazil

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The technology use of soil and plant bioactivation has been proposed for increasing soil microbiota, promote better nutrient equilibrium and enhance general soil attributes (biological, physical and chemical), as well achieving higher crop yield due to further optimization in the use of soil nutrients, especially phosphorus. The objective of the study was to determine the common bean performance, grain yield and yield components of common bean as affected by bioactivation and different dosis of inorganic phosphorus. The experiments were conducted in field conditions irrigated in two growing seasons. The experimental design was a randomized block design in a factorial 4 x 2. The treatments consisted of four levels of phosphorus in the soil (0, 40, 80 and 120 kg ha⁻¹ of P₂O₅) in the presence and absence of bioactivation (penergetic) applying. Phosphorus applying allowed significant increases in grain yield and yield components of common bean in the two growing season. The bioactivator applying independent of the phosphorus use attained higher bean grain yield than the treatments without applying in the two growing season. In 2013, the bioactivator applying allowed the highest grain yield (5,313 t ha⁻¹) at a lower phosphorus than in the absence of the bioactivator (3903 kg ha⁻¹) at the highest dose of P (120 kg P₂O₅ ha⁻¹). The results showed that cultivate in a good P status in the soil, with an adequate soil management including the bioactivation it's possible to enhance soil attributes, optimize the use of phosphorus, increasing bean grain yield, decreasing production costs and enhance the net income in a sustainable way towards sustainability.

Keywords: *nutrient uptake efficiency, better soil attributes by soil and plant bioactivation, phosphorus use efficiency, Phaseolus vulgaris reduction production costs*