

Title: Effectiveness of biofertilizer with organic matter enriched in N and chitosan by interactive inoculation on lettuce characteristics and soil attributes

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Abstract:

The study aim to evaluate the effectiveness of biofertilizer produced with PK rocks and earthworm compost enriched in N by diazotrophic bacteria and addition of fungi *Cunninghamella elegans* that contain chitosan in the cellular wall, compared with soluble NPK fertilizers on yield and nutritional status of lettuce in two consecutive cycles, and in soil chemical attributes. The experiment was conducted in a factorial 8x2, with 8 fertilization treatments with and without foliar application of chitosan, in four replicates. The fertilization treatments were: NPKF in recommended rate (RR); Biofertilizer 50 % RR; Biofertilizer 100 % RR; biofertilizer 150 %RR; protector 50 %RR; protector 100 %RR; protector 150 %RR; earthworm compost (2.4 L plant⁻¹). The lettuce characteristics displayed best results when applied biofertilizer in rate 100%RR, and earthworm compost produced lowest values. In the first cycle the total N, P and K in lettuce showed lower values when applied the NPK fertilizers in higher doses, probably by the effect promoted in the soil acidity. Total N, available P and K in soil displayed positive and significant effect of biofertilizer and protector compared with soluble fertilizer and earthworm compost. The effects of chitosan by foliar application was not evaluated because do not occurred phytopatogenic microorganisms on lettuce in the field experiment. By the experimental results it was observed that the biofertilizer and the protector may be alternatives for substitution of commercial fertilizers.

Keywords: *Cunninghamella elegans*. *Lactuca sativa*. Organic fertilization. Rock biofertilizers. Mineral nutrition. Nutrients availability.

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