

## Effect of zinc oxide (nano and ordinary) and *Glomus intraradices* fungi on yield components and concentration of micronutrients in green bean plant

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### Abstract

This study was conducted to assess the effects of zinc oxides (nano and ordinary) and *Glomus intraradices* fungi on yield concentration of micronutrients in green bean plant, by employing a factorial, completely randomized design, and three replications, under greenhouse conditions. The experimental factors included two levels of *Glomus intraradices* (with and without inoculation), two types of zinc oxide (nano and ordinary) and four levels of zinc oxide (0, 50, 100 and 200 mg/kg). Results showed that 100 mg/kg nano zinc-oxide treatment with *Glomus intraradices* had significant effects on growth and yield of green bean. Concentration of Zn, Cu and Fe in plant, dry weight of roots and shoots per pot, length of roots and shoots per pot, and 100-seed weight were increased. Nano zinc-oxide treatments enhanced all measured parameters more than ordinary zinc-oxide treatments. Also, *Glomus intraradices* had positive significant effects on Zn, Cu and Fe concentrations in green bean plant.

**Keywords:** Nanotechnology, Nanofertilizers, *Glomus intraradices* fungi, Green bean.

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