

# Study of Soybean [*Glycine max* (L.) Merr] Growth Indices and Yield Response to Biofertilizers, Mycorrhizae and *Thiobacillus* Inoculation

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## Abstract

In order to reduce chemical fertilizers usage and finally sustainable agriculture an experiment was conducted on 2006 to study soybean yield and growth indices under the effect of biofertilizers, *Thiobacillus* and mycorrhizae, in a split plot design based on randomized complete block design with two soybean cultivars (including Sari (JK- 695) cultivar and 032 promising line) as main plot and six levels of fertilizer treatments (including, F1: NP (control, 25 kg/h urea, 100 kg/h triple superphosphate); F2: NPK(NP+ 150 kg/h potassium sulphate); F3: NPK+ S (100 kg/h Sulfur); F4: NPKS + Seed inoculation with *Thiobacillus* bacteria; F5: NPK + Seed inoculation with mycorrhizae fungi and F6: NPKS + seed inoculation with *Thiobacillus* and mycorrhizae) as sub plot. To plant growth analysis, two growth parameters including leaf area index (LAI) and total dry weight (TDW) was measured during plant growth stages and to evaluate yield and biomass an area about 1m<sup>2</sup> from each plot were hand harvested at the maturity stage (R8). Results revealed that JK cultivar had advantage compare to 032 line in terms of yield and total dry weight. Among different fertilizer treatments, NPKS, NPKST and NPKM treatments had the highest value of yield, TDW, RGR and LAI compare to other treatments, because of biofertilizers, *Thiobacillus* and mycorrhizae and sulfur applying made suitable situation for plant and increased plant growth and development. Coefficient correlation among treatments showed a positive and significant correlation between yield and all studied traits except relative growth rate (RGR) that was not significant. The most correlation of grain yield was observed with biomass ( $r= 0.98^{**}$ ) and among growth indices with crop growth rate ( $r= 0.84^{**}$ ).

Key words: soybean, growth index, mycorrhizae, *Thiobacillus*, leaf area

sa2008\_a0511