

Biopriming of Rice Seeds with Plant-Growth-Promoting *Trichoderma citrinoviride* TRI103 Reduces Nitrogen Fertilizer Usage Under Greenhouse Conditions

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Abstract

The increased use of synthetic fertilizers in agriculture has been a financial burden for farmers while posing environmental and human health risks. This study aimed to explore the impact of seed biopriming with a novel isolate of plant growth promoting *Trichoderma citrinoviride* on growth and yield parameters of rice variety Bg 352 under 30% reduced level of recommended nitrogen fertilizer applications. Rice was cultivated under greenhouse conditions following the Completely Randomized Design with thirty replicates. The pure culture of the fungus was grown in Potato Dextrose Agar (PDA), and spore suspension (1×10^7 spores/ ml) was used for seed-biopriming. The ability of *Trichoderma citrinoviride* to produce Indole Acetic Acid (IAA) was assayed *in vitro* using the Swalkowski reagent. Plant growth characteristics (shoot and root dry weight, number of tillers per plant) and yield parameters (number of panicles, grain yield, number of full grains per panicle) were recorded. Data were analyzed statistically using ANOVA at 5% significance level. Plant and root development rose for seeds primed with *Trichoderma citrinoviride*. When biopriming seeds of with *Trichoderma citrinoviride*, a 30% nitrogen fertilizer reduction resulted in no significant difference when compared with control. The *in vitro* studies confirmed the IAA production of *Trichoderma citrinoviride*. As a result, it can be stated that biopriming rice seeds with novel *Trichoderma citrinoviride* may be employed in paddy production with lesser nitrogen application. However, the study should be carried out under field conditions.

Keywords: *Trichoderma citrinoviride*, 30% Nitrogen reduction, Biopriming