

APPLICATION OF ACTINOMYCETES IN NUTRIENTS

MANAGEMENT OF GUAVA CROP

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ABSTRACT

Actinomycetes are well known for their role in plant growth enhancement and disease management in wide array of crops. Ten actinomycetes isolated from AM fungal spores colonizing guava rhizosphere were studied for growth improvement of guava cv Arka Kiran under polyhouse condition, enhancement of nutrient uptake and their antagonistic potential against Fusarium solani in in vitro. Out of ten isolates the better antifungal activity was observed in Streptomyces cinnamonensis followed by S.avermitilis and S.netropis. Chitinase genes responsible for the antifungal activity were mined from of S.cinnamonensis and other isolates and expressed in M15 E.coli cells. The protein bioassay studies showed that out of three isolates the expressed protein samples respective to S.cinnamonensis showed maximum growth inhibition (1.3 ± 0.16 cm) on F. solani followed by S.avermitilis and S.netropis. Increased plant dry matter was observed in S.albidoflavus (0.856 ± 0.0 g) inoculated plants followed by S.violarius (0.437 ± 0.0) along with increased shoot length (15.5 ± 1.63 cm), (15.2 ± 2.4 cm) over control plants. The increased level of N, P and K was observed in treatments containing S.canus (1.93 ± 0.10 %), S.cinnamonensis (0.57 ± 0.01 %) and S.fradiae (6.15 ± 0.12 %). Soil N was found more in S.scabiei inoculated soil (894.24 ± 0.81) and P, K content increased in S.cinnamonensis (44.43 ± 0.84 ppm) (1606.25 ± 0.04 ppm) treatment over control. Among macro nutrients Ca, was found more in S.avermitilis inoculated plants (130.07 ± 4.9 ppm) followed by S.fradiae inoculated soil (2363.6 ± 2.57). Mg content was higher in S.violarius inoculated plants (2.2 ± 0.16 %) and soil (366.16 ± 1.32 ppm). There was significant improvement in micro nutrient (Fe, Mn, Zn) content in plant and soil.

KEYWORDS: Glomus mosseae, Actinomycetes, Nutrient Mobilization. Chitinase, Fusarium solani

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