

Research Article: PP Singhal Memorial PI Industries Award 2015 – Runner**Optimization of Nutrient Sources to Increase the Biomass Production and Development of *Trichoderma harzianum* Th14 Formulations****Dinesh Rai¹ and AK Tewari²**

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Abstract

The aim of the present investigation was to study the influence of various factors on mass production of *Trichoderma harzianum* strain14 (Th14) and to develop different bioformulations for higher CFU, shelf-life and to assess their efficacy against chickpea mortality. Among various sources, maximum biomass and sporulation was observed in honey (1190mg; 7.06×10^8 spores/ml), ammonium sulphate (1035mg; 10.12×10^8 spores/ml), asparagine (945mg; 7.24×10^8 spores/ml) and becosule (892mg; 6.04×10^8 spores/ml) as a best source of carbon, nitrogen, amino acid, and vitamins respectively. Th14 grew well and produced maximum biomass and sporulation at 15 days after incubation (958mg; 4.54×10^8 spores/ml) and at 6 pH (1102mg; 5.00×10^8 spores/ml). In different Th14 formulations CFU ranged from 16.60 to 43.10×10^7 spores/ml at the time of preparation and it was maximum in oil based TF-LQ6 (43.10×10^7 spores/ml) and minimum in paste based TF.P8 (16.60×10^7 spores/ml) formulations. All the formulations retained optimum CFU of 2.50 to 9.67×10^7 and 0.67 to 3.83×10^7 at 15 C-35 C and 4 C after 6 and at 11 months respectively. Rhizosphere population of Th 14 increased up to 45 DAS in all the formulations, and thereafter decreased. Maximum CFU/g soil was observed in powder based TF-W2 (1.30×10^5 spores/g) followed by TF- W3 (1.16×10^5 spores/g) and powder-1 (1.06×10^5 spores/g) based formulations. Maximum seedling vigour (4836) and plant vigour index (6008) was observed in powder based TFW-2 followed by TF-W3 (5641).based formulations. Minimum seed and plant mortality (6.67 & 10.74%) was observed in Powder based TF-W1 followed by TF-W2 (10.00 & 14.54%) and TF-W3 (13.33 & 15.28%) based formulations.

Key words: Bio-formulations, carbon and nitrogen sources, growth promotion, *Trichoderma harzianum*, chickpea mortality

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