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## A Rapid Bio-Test to Study the Activity Potential of Biofertilisers Based on *Trichoderma* sp.

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### Abstract

Bio-effectors based on plant-growth-promoting soil microorganisms are increasingly distributed on the European market and particularly in the tropics. Mobilisation of sparingly available plant mineral nutrients, stimulation of root growth, enhanced resistance to environmental stress factors and direct or indirect suppression of plant pathogens and induced resistance are discussed as possible mechanisms for the effectiveness of these products. However, these assumptions are based only on scarce scientific evidence which is further absured by a lack of standards for production and quality control. Therefore, rapid screening tests to evaluate the potential effectiveness of a given product, prior to more detailed and labourious investigations are urgently needed. In this study, a rapid bio-test with cucumber (*Cucumis sativa*) as an indicator plant was developed to evaluate the effectiveness of four commercial bio-effectors based on *Trichoderma* sp. (Biohealth-G, Biohealth-WSG, Biomex and Vitalin T50) using germination rate, root and shoot biomass, root length, and leaf area as test parameters. The experiment was repeated twice with 6 replicates in hydroponics culture under controlled conditions (pH 5.5, 22° C; Light: 230 mmol cm<sup>2</sup> sec<sup>-1</sup>). Biofertilisers were applied at the rate of 3g/2.5 l pot. Germination increased by 40–50 % in all biofertiliser treatments compared to the control. After 2 weeks culture period, root dry weight and leaf area of Biohealth-G, Vitalin T50 and Biomex-treated cucumber seedlings were significantly increased. Biohealth-G and Vitalin T50 showed significantly higher root length and Biohealth-G higher shoot dry weight than the remaining treatments, while Biohealth-WSG did not cause differences compared to untreated control plants. The pathogen-antagonistic potential of *Trichoderma* strains can be easily tested by co-inoculation with *Gaeumannomyces graminis* on malt extract peptone agar plates. The results suggested that the activity potential of different *Trichoderma*-based biofertilisers could be easily screened by using the described bio-test with cucumber seedlings.

**Keywords:** Biofertiliser, *Cucumis sativa*, hydroponics, *Trichoderma* sp.