

Biocontrol efficacy of *Trichoderma asperellum*-enriched coconut fibre against *Fusarium* wilts of cherry tomato

ABSTRACT

Aims: Agro-based wastes were evaluated as a medium for mass micropropagule production and optimal efficacy of *Trichoderma asperellum* B1092 in controlling *Fusarium oxysporum* f. sp. *lycopersici* and promoting tomato growth. This study focused on biological control because pathogen persistence in the soil makes the disease difficult to control. **Methods and results:** Rice bran, biochar, empty fruit bunches, coconut fibres, compost, top soil and mixed soil were evaluated as media for mass multiplication of *T. asperellum*, which is effective in controlling plant pathogens. Yielding the most colony forming units (CFU) among the media, coconut fibre was deemed most suitable for promoting sporulation. After 120 days on the medium, *T. asperellum* B1902 produced 9.053×10^5 CFU per gram coconut fibre; oil palm empty fruit bunches was second highest (7.406×10^5 CFU per gram). In field tests of *T. asperellum* B1092 against *F. oxysporum* f. sp. *lycopersici* (causing *Fusarium* wilt of cherry tomato), B1092 significantly promoted plant growth compared to the control. The efficacy of this formulation resulted in increased growth of roots and shoots tomato plants and total lycopene, sugar, K, N, Ca, P and Mg content after 120 days. **Conclusions:** *Trichoderma asperellum* B1092 showed great field potential for improving productivity and quality of tomatoes and in controlling *Fusarium* wilt of cherry tomato. **Significance and impact of the study:** This innovative approach using a cheap agro-waste to control the persistent soil-borne *Fusarium* pathogen of cherry tomato should increase soil survival rate of *Trichoderma* and has potential for upscaling in the field for other crops.

Keyword: Agriculture; Fungi; Plant diseases; Plant pathology; Soil