

Evaluation of shelf life of biocontrol agent *Trichoderma* isolate T13 with different formulations

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Trichoderma isolate T13 has been identified as a potential biocontrol agent against the Panama wilt pathogen *Fusarium oxysporum* f. sp. *cubense* and it can be produced in mass quantities *in-vitro*. However better formulation is required for field applications. Therefore, here we report the evaluation of different formulations of *Trichoderma* isolate T13 in relation to its shelf life. As carrier materials, Talcum powder and Lignite were used in different ratios as follows (t1=0:50, t2=1:4, t3=2:3, t4=1:1, t5=3:2, t6=4:1, t7=50:0) and 10 mL of concentrated conidia suspension (6.16×10^9 conidia/mL) of T13 was added to each treatment for the preparation of formulations. The best ratio was selected by assessing colony forming units (cfu/g) of *Trichoderma* T13 culturing in *Trichoderma* selective media at every 4 weeks intervals after inoculating into the sterilized soil. It has been revealed that 4 weeks after inoculation of soil, T13 population was significantly increased in all treatments ($p < 0.05$) except t6 and t7 compared to T13 population at day zero. At 8th week of the post-inoculation, cfu/g of t2 significantly increased ($p < 0.05$) while in other treatments' cfu/g was increased but not significant compared with 4 weeks of the post inoculation. At 12th week of the post inoculation, fecundity (cfu/g) of t2 significantly increased ($p < 0.05$) while cfu/g of t3 and t4 was insignificantly decreased. At the same time, viability of T13 in t1, t5, t6 and t7 was diminished significantly (cfu/g). However, cfu/g of t2 was started to reduce after 16 weeks of the post-inoculation and the t1, t3, t5, t6 and t7 showed decreasing trend with the time. According to the results, during 20 weeks from post-inoculation, formulation t2, showed significant conidia viability of *Trichoderma* isolate T13. Therefore, it can be concluded that, Talcum; Lignite 1:4 would be the best ratio for the formulation of T13 conidia for field application.

Keywords: *Trichoderma*; Formulation; Shelf life; Viability

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