

Development of *Trichoderma* based bulb treatment for the management of anthracnose and white rot in onion (*Allium cepa* L.)

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Onion (*Allium cepa* L.), which belongs to family Liliaceae is susceptible to anthracnose and white rot diseases in fields. Onion farmers rely on fungicides, to manage these diseases despite the high production cost and environmental pollution. Bulb treatment with *Trichoderma* fungus, widely used as a biocontrol agent, could be a sustainable option to manage these diseases in onion. Therefore, an investigation was carried out to develop a bulb treatment protocol before planting to manage field diseases; anthracnose caused by *Colletotrichum gloeosporioides* and white rot caused by *Stromatinia cepivora* in onion. Big onion variety MIBO 01 bulbs were treated prior to planting in pots by mixing with *Trichoderma* powder (4×10^6 CFU per gram) (T1), by soaking in *Trichoderma* liquid (T2) and soaking bulbs with the fungicide Thiophanate-methyl (50%) + thiram 30% W/W (T3), together with untreated control (T4). The pots (10 replicates per treatment) were arranged in a completely randomized design (CRD). The data was subjected to one-way ANOVA and DMRT using SAS software at a 5% probability level. Anthracnose Disease Severity index (ADSI) and the white rot disease incidence (WDI) were significantly different among the treatments at $P < 0.05$. ADSI and values in T1, T2, T3 and T4 were in the order of $11.1 \pm 0.15\%$, $33.3 \pm 0.35\%$, $39.9 \pm 0.45\%$ and $63.3 \pm 0.85\%$, respectively while WDI in T1, T2 are 00%, T3 and T4 were in order 30% and 50%, respectively. These findings suggest the pre-planting application of *Trichoderma* on bulbs as a promising alternative to fungicides in managing white rot infections and the leaf anthracnose of the big onion variety MIBO 01. Repetitive field trials would be helpful in order to optimize the efficacy of the treatment.

Keywords: Anthracnose, Big onion, Bulb treatment, *Trichoderma* spp., White rot

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