

Integration of biological and physical tactics for management of tomato root rot under humid conditions of Nagaland

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ABSTRACT

Tomato (*Solanum lycopersicon* Mill) is a popular vegetable crop cultivated throughout the world. Root rot caused by *Rhizoctonia solani* is reported to be one of the most devastating diseases of tomato. This research planned with aimed to effectively manage the tomato root rot disease by physical, biological, chemical methods and their combinations. The field experiment was conducted at School of Agricultural Sciences, Nagaland University, Medziphema campus. Under in vitro tests, bio-agents such as *Trichoderma harzianum*, *T. harzianum*-14, *T. virens*, *T. asperellum*; and fungicides namely azoxystrobin, mancozeb, copper oxychloride and chlorothalonil were evaluated for their inhibitory effect on *R. solani*. Among the antagonists, *T. harzianum*-14 was found most effective against *R. solani* with 67.43% inhibition under in vitro condition. Among the fungicides, mancozeb and copper oxychloride gave 100% inhibition against the pathogen. Compatibility test indicated that *T. harzianum*-14 was compatible with mancozeb at 0.25% concentration with 13.21% inhibition. Under field condition, integration of soil solarization for four weeks, soil treatment with *T. harzianum*-14 and spray with mancozeb (T_9) showed minimum disease incidence (22.22%) and plant height (69.53 cm), maximum branches number 8.20, number of maximum fruits/plants 35.77 and root length 24.83 cm. Highest average yield was obtained from the integrated management application (T_9) with 179.17 q/ha.

Keywords: Integrated management, mancozeb, *Rhizoctonia solani*, soil solarization, tomato, *Trichoderma harzianum*-14.