

Induction of resistance in tomato by biotic and abiotic inducers against early blight disease

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Tomato (*Lycopersicon esculentum* L.) is a popular vegetable widely grown in the tropics, which is mainly attacked by the Early blight disease incited by *Alternaria solani*. In this present scenario, ecofriendly alternative strategies such as use of *Trichoderma harzianum* and *Pseudomonas fluorescens* from rhizosphere and abiotic inducers (3% Mannitol, 2.5% Chitosan, Arachidonic acid) are being explored. Efficacy of various inducers were evaluated under green house conditions for efficacy in suppressing incidence of Early blight disease and promoting plant growth in tomato. Among the various inducers tested, 2.5% Chitosan and combination of 3% Mannitol and *Trichoderma harzianum* increased the plant growth and highly inhibited the mycelial growth of the pathogen under in vitro conditions. In green house studies, seed treatment combination of 3% Mannitol and *Trichoderma harzianum* significantly reduced incidence of the disease (66.23 % more efficient than control), compared to the other inducers. Expression of various defense-related enzymes was found to be involved in the induction of systemic resistance against pathogen infection. Tomato plants were treated with a combination of 3% Mannitol and *Trichoderma harzianum* based bioformulation and seedlings were challenge inoculated with the pathogen, *Alternaria solani*. Induced enzyme activities were observed with both the defense related enzymes such as Peroxidase (PO) and Phenylalanine Ammonia Lyase (PAL). The enzyme activity increased from 24 hr of after inoculation and maximum activity was observed at 48 hr after inoculation and then it slightly decreased. The possible applications of a combination of Mannitol and *Trichoderma harzianum* tomato seed bioprimering for effective management of early blight disease is discussed in the paper.

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