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Bio-Fertilisers and Plant Strengtheners can Reduce the Susceptibility of Tomatoes to *Phytophthora infestans*

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Abstract

Late blight, caused by *Phytophthora infestans* is one of the most destructive disease of tomatoes affecting organic and conventional tomato production worldwide. Exploitation of induced resistance is a desirable strategy in plant protection since it involves enhancing natural defense mechanisms in plants. Induction can be achieved via the leaves or via the roots. Induced resistance through plant strengtheners could be part of alternative strategies for the control of late blight of tomatoes. Organic fertilisers stimulate soil microbial activity and through this may also have positive effects on the host's metabolism ultimately limiting plant infestation.

The main aim of this research was to determine if soil fertility management and plant strengtheners interact in their effects on plant susceptibility. For this tomato plants (cultivar Philovita) were grown with three bio-fertilisers: horn meal, Bioilsa fertile and ILSA 12 with or without three plant strengtheners (Quality, Alfa-Alfa extract, Meat extract) in a commercial type of set up in a plastic tunnel. Detached leaves of adult plants were inoculated with 20 μl sporangial solution at 5×10^4 sporangia ml^{-1} of one *P. infestans* isolate in the laboratory under controlled conditions two times during the season. In additional experiments the plant strengthener Quality was tested on young plants of various cultivars combined with various growth substrates. In comparison to horn meal, the bio-fertilisers Bioilsa fertile and ILSA 12 and the plant strengtheners significantly reduced late blight susceptibility. There were no interactions and the effects were additive. Bioilsa fertile, Quality and Alfa-Alfa extract were most effective in reducing late blight susceptibility. Quality reduced the susceptibility of tomatoes independent of plant age, growth substrate or fertiliser used. Combining plant strengtheners with organic soil fertilisers could become part of a strategy for disease management.

Keywords: Alfa-Alfa extract, Bio-fertilisers, Bioilsa fertile, ILSA 12, induced resistance, meat extract, *Phytophthora infestans*, plant strengtheners, quality, tomato

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