

INTEGRATED BIOLOGICAL CONTROL APPROACH FOR LETTUCE PATHOGENS: COMBINING BENEFICIAL MICROBES AND CULTIVATION PRACTICES

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Introduction

Soft rot, caused by pectolytic bacteria, especially from the genus *Pectobacterium*, is one of the most significant diseases of lettuce, causing significant crop losses. Due to limitations on the use of chemical pesticides and their limited efficacy, the development of biological control methods, including those based on *Bacillus subtilis*, has become an urgent issue.

Methods

Greenhouse-grown lettuce plants were inoculated with *Pectobacterium* spp. and treated with liquid *Bacillus subtilis* formulations. Treatment efficiency was assessed under varying application regimes based on disease severity, infection radius, and plant growth metrics.



Aim

To assess the biocontrol potential of *Bacillus subtilis* preparations against soft rot of lettuce caused by *Pectobacterium* spp. under greenhouse conditions.

Results & Conclusions

Various strains of *B. subtilis* demonstrated high antagonistic activity against *Pectobacterium*-caused infection, particularly when integrated with specific agricultural techniques. The combined use of microbial preparations and agricultural techniques that promote the activity of these antagonists can be an effective and environmentally friendly alternative to traditional chemical methods of protection.

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