

Bio-fertilizers and plant strengtheners can reduce the susceptibility of tomatoes to *Phytophthora infestans*

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Introduction

Organic fertilizers stimulate soil microbial activity and also have positive effects on the hosts metabolism ultimately limiting plant infestation by pathogens. The main aim of this research was to determine if soil fertility management and plant strengtheners interact in their effects on susceptibility of different tomato varieties against *Phytophthora infestans*.

Methods

Effects of the following factors were investigated:

- Fertilisers:** Horn meal, BIOILSA FERTILE, Biofeed BASIS, chemical control
- Plant strengtheners:** ALFALFA extract, Biofeed QUALITY, and PEN extract versus water
- Soils:** Peat, Peat+Compost+field soil, field soil
- Up to six tomato cultivars**
- Young or adult plants**
- Three isolates** of *P. infestans*, Inoculation with 20µl (5*10⁴ sporangia ml⁻¹).

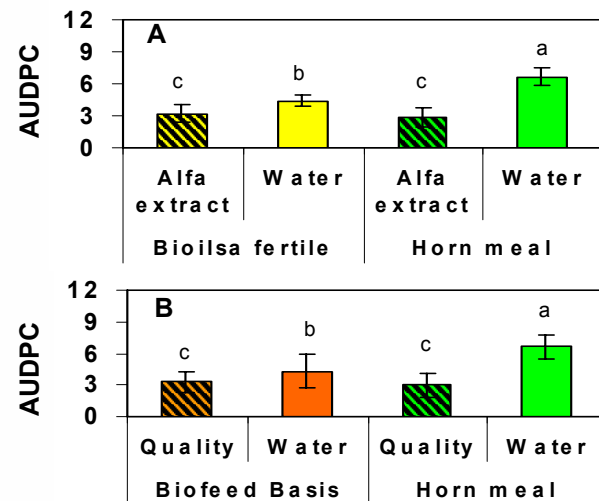


Fig. 2. Cumulative disease severity (AUDPC) on adult container grown plants of Philovita fertilized with various bio fertilisers. The effects of fertilizers and plant strengtheners were additive with no interactions. Error bars= ±SD. Different letters indicate significant differences (P≤0.05, Tukey-test).

Results

Plants fertilised with Biofeed Basis and Bioilsa were significantly more resistant than when fertilised with Horn Meal or chemically (Fig. 1) with no variety * Pathogen isolate interaction. PS significantly reduced late blight susceptibility (Fig. 2) with a highly significant tomato cultivar * pathogen isolate * plant strengthener interaction (F=4.41, P≤0.0001) (Fig.3).

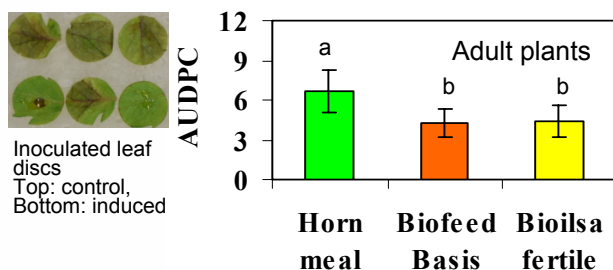
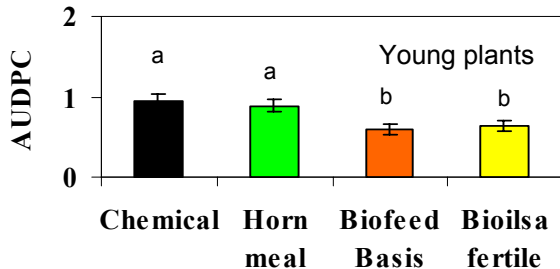


Fig.1. Top: Cumulative disease over time (AUDPC) on young plants of six tomato cultivars tested in laboratory experiments with 3 isolates of *P. infestans* on detached leaf disks. There were no Variety * isolate * fertilizer interactions. Bottom: AUDPC on detached leaves of adult plants of cultivar Philovita. Different letters indicate significant differences (P≤0.05, Tukey test).

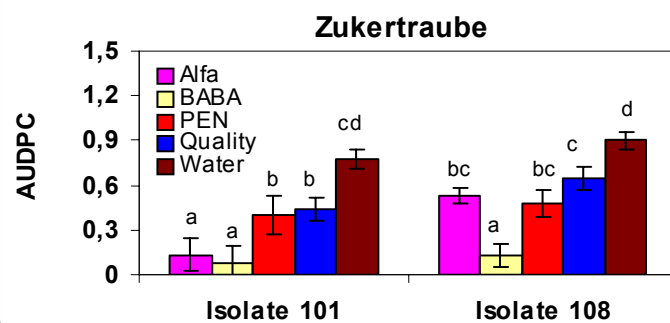


Fig. 3. Effects of the plant strengtheners Quality, PEN and Alfalfaextract compared to standard inducer BABA and control treatment water on tomato cv. Zuckertraube against two *P. infestans* isolates. Different letters indicate significant differences (P≤0.05, Tukey test).

Conclusion

Late blight susceptibility of tomatoes fertilised with Biofeed basis and Bioilsa fertile was significantly reduced compared to Horn meal and chemical fertilizer. The three way interaction of PS*Tomato cultivars*Pathogen isolate suggests that different resistance mechanisms may be induced by the Plant strengtheners.