

Alternative methods to control *Phytophthora cactorum* in strawberry cultivated in soilless growing media

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Introduction

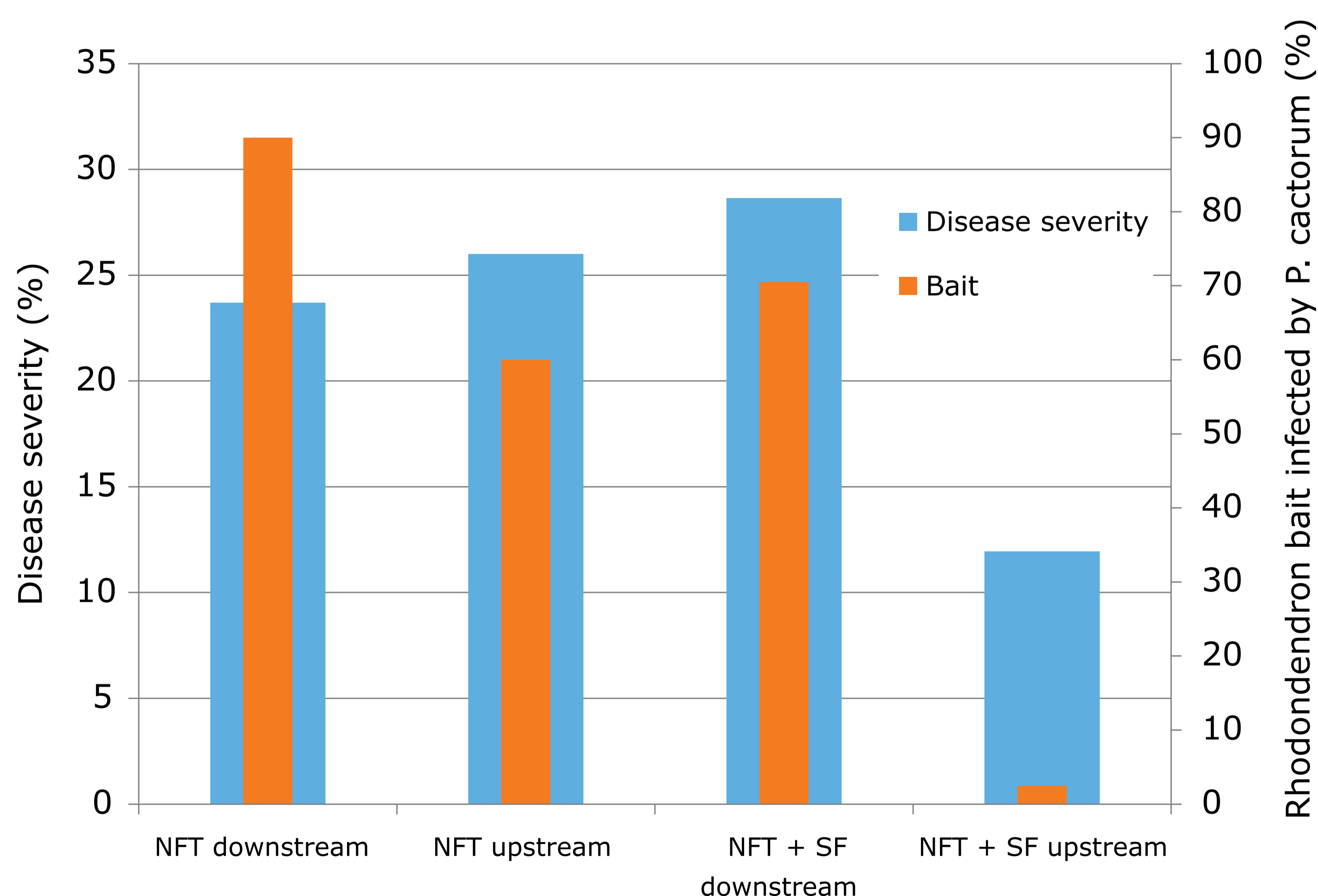
Phytophthora cactorum is an important threat in strawberry cultivation. The aim of our research was to investigate which methods effectively reduce disease pressure of *P. cactorum*. The efficacy of slow sand filtration to remove *P. cactorum* from drain water was tested. Furthermore, treatments were investigated to enhance the suppressiveness of a peat substrate or resistance of strawberry transplants in order to control *P. cactorum*.



Strawberry plants infected with *Phytophthora cactorum*; right: internal symptoms

Slow sand filtration

Slow sand filtration effectively removed *P. cactorum* from drain water in nutrient film technique (NFT) cultivation.

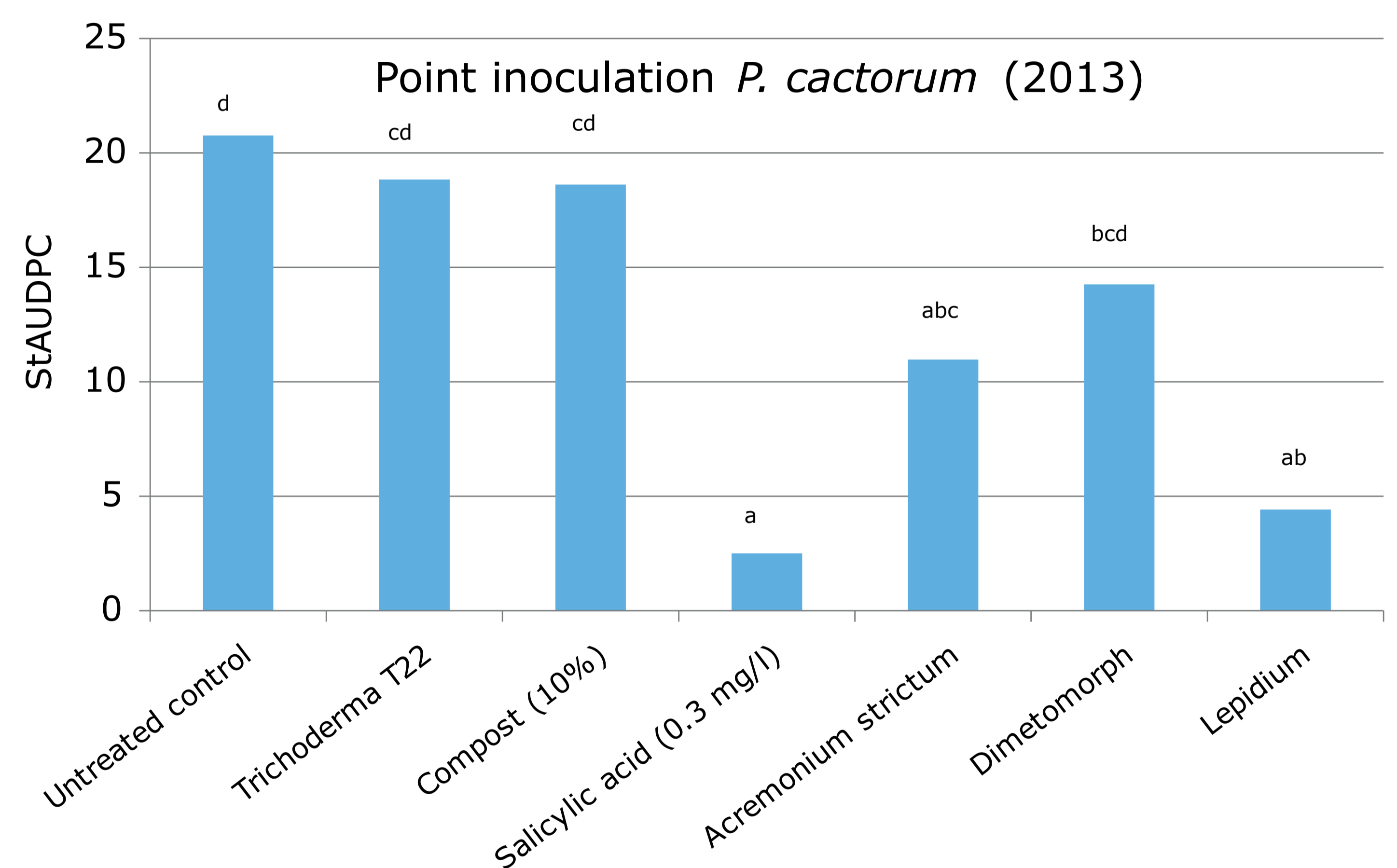


Disease severity in strawberry plants was reduced with 45 to 65%, and rhododendron baits showed a 95-100% reduction of *P. cactorum* after the drain water had passed the sand filter.

Disease suppression

Antagonistic bacteria inhibiting growth of *P. cactorum* were generally present in roots, rhizosphere, as well as in the crown. However, several peat mixtures and adding compost, chitin, or antagonistic micro-organisms could not elevate suppressiveness against *P. cactorum*. On the other hand, pasteurization of the substrate mixtures showed increased levels of disease, indicating that biological factors do play a role in disease suppression.

Further experiments were performed where different elicitors and beneficial microorganisms were added to young plants. The most promising treatments were salicylic acid, followed by inoculation with the endophytic fungus *Acremonium strictum*, and growing *Lepidium sativum* previous to the crop.



Standard area under the disease progress curve (StAUDPC) based on disease severity caused by *P. cactorum* inoculated at the bottom of the pot in strawberry transplants.

Conclusions and future research

- Sanitation and reducing spread of inoculum are crucial to avoid infections. Slow sand filtration effectively removed *P. cactorum* from drain water.
- Creating more suppressive soilless growing media was not successful.
- Enhancing plant resistance by treating young plants with salicylic acid was promising. Inoculating plants with *Acremonium strictum*, and growing *Lepidium sativum* previous to the crop had some effect. We are now testing the efficacy of combinations of these treatments.

