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Swedish University of Agricultural Sciences

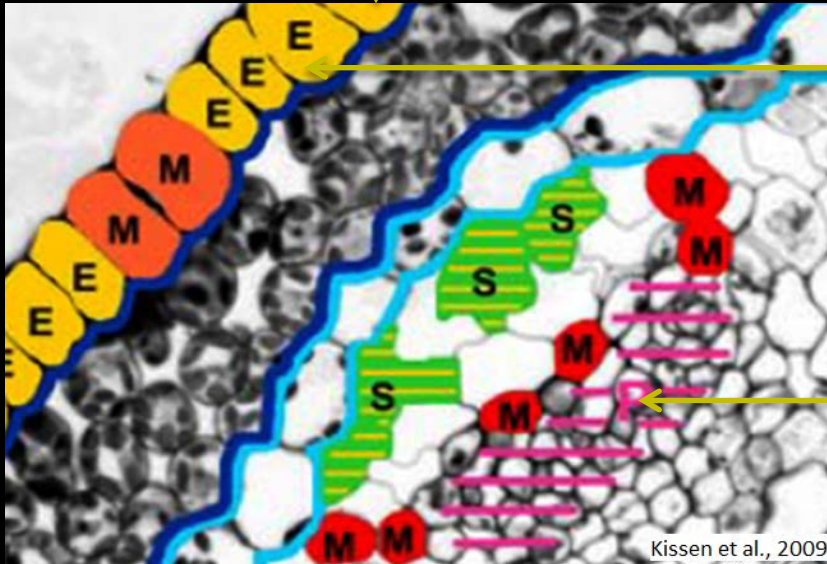
Impact of Brassicaceae Cover Crops on Pea Root Rot (*Aphanomyces euteiches*) in Subsequent Peas

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25th March 2014

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Disease control using glucosinolate containing plants



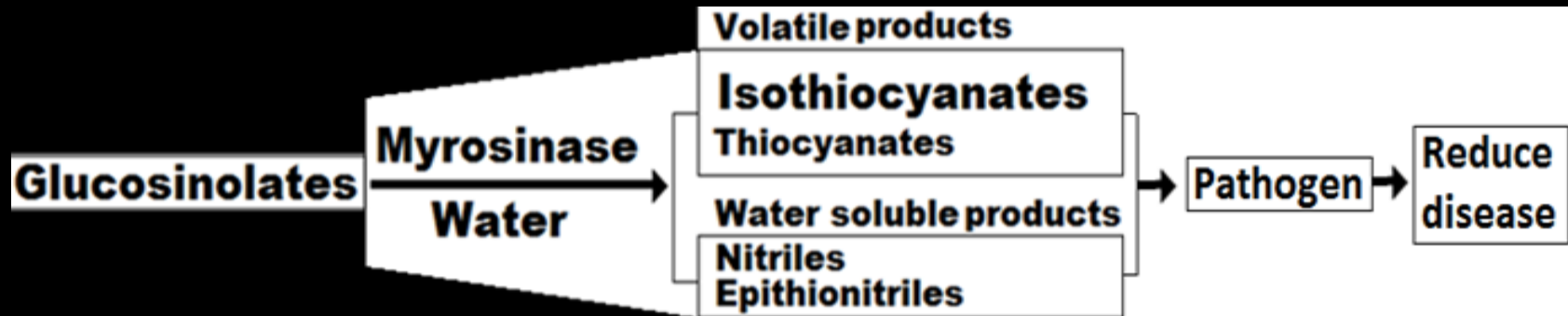
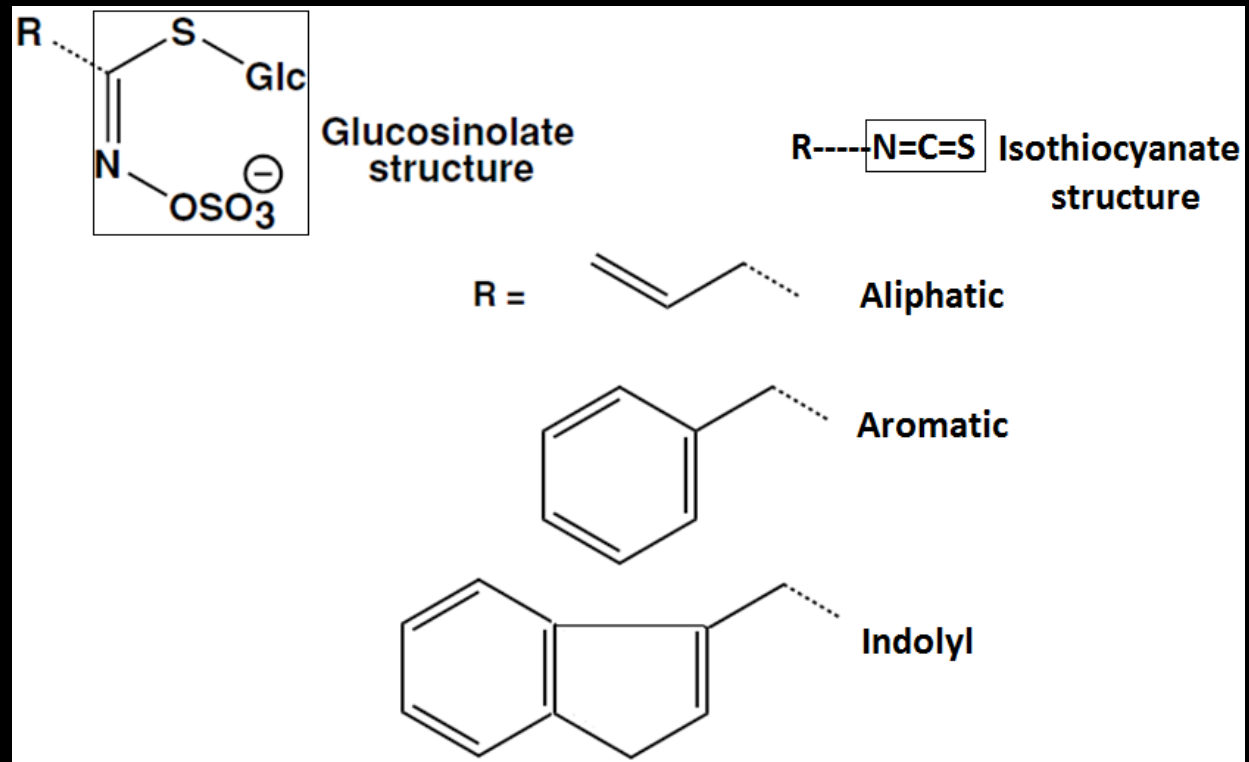
Epidermal

← Myrosinase

← Glucosinolates

← Phloem

Bio-fumigation

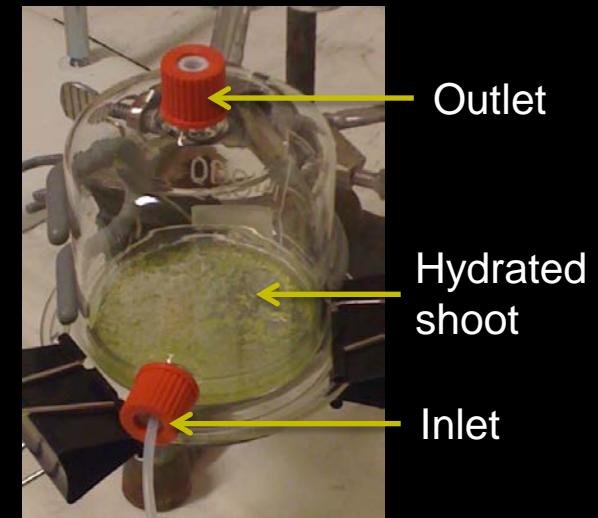
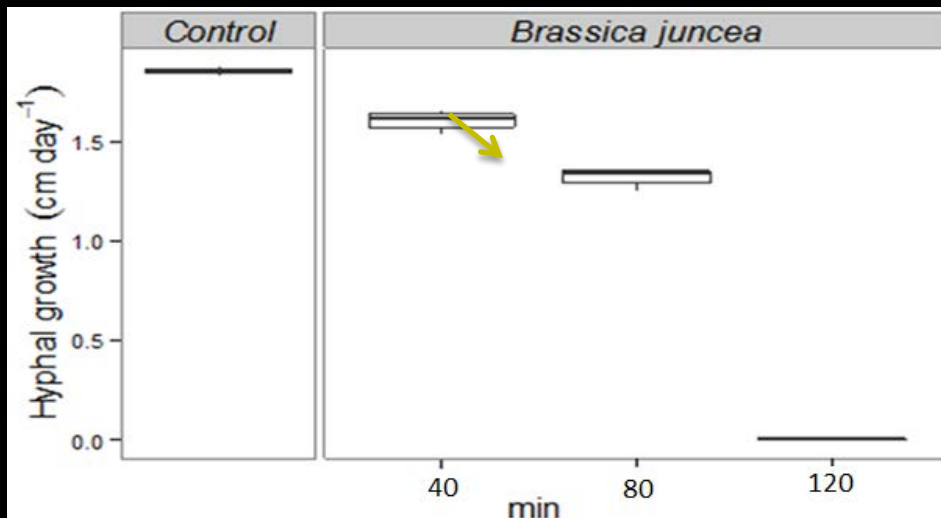
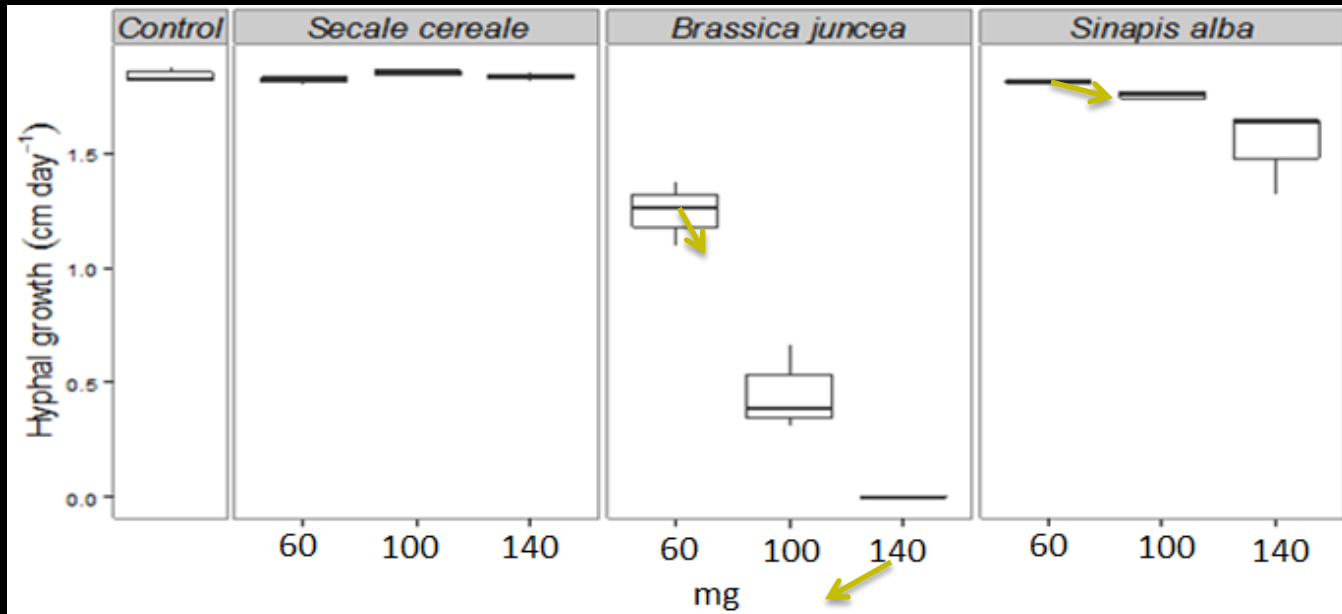


Investigations

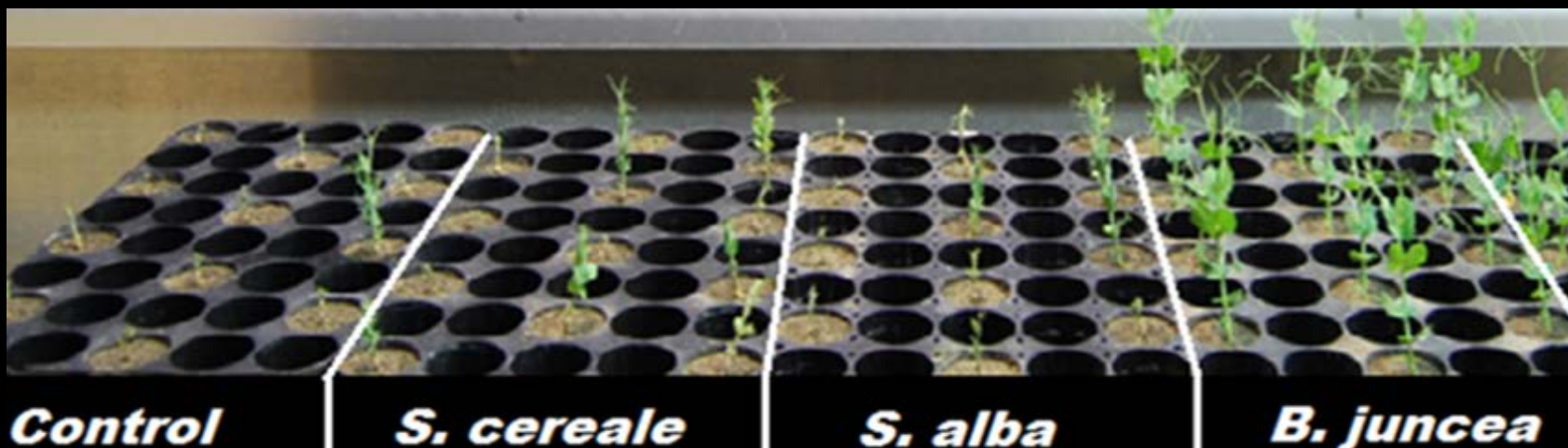
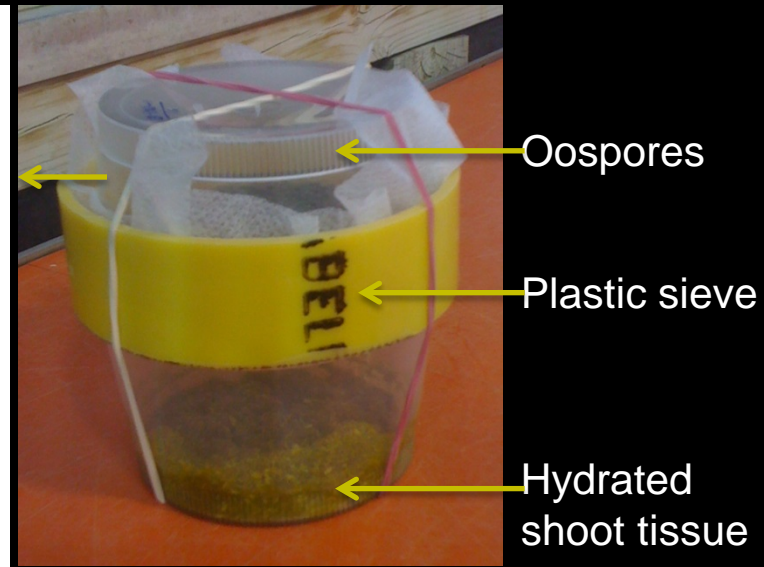
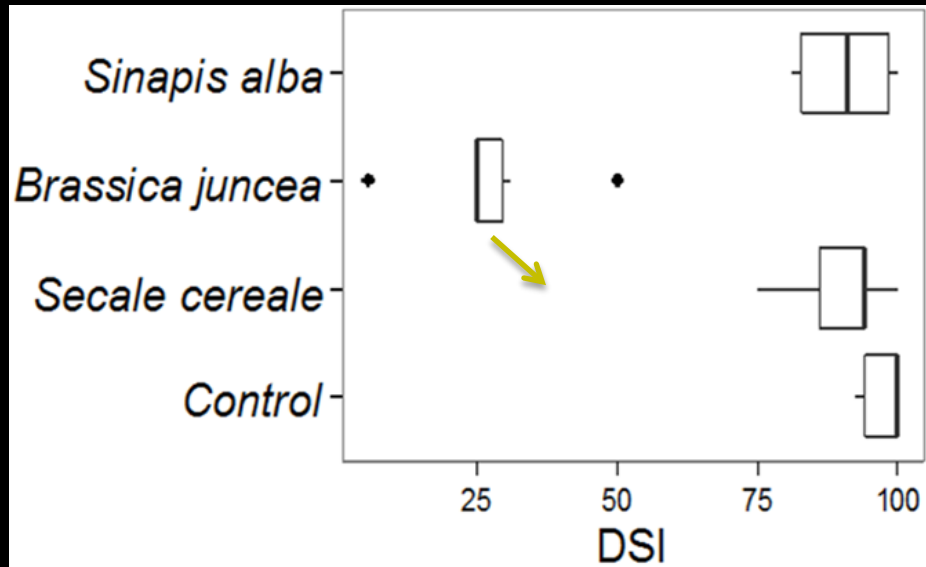
- Effects of brassica **shoot tissue** on *A. euteiches* and pea root rot
- Effects of growing brassica **roots** on pea root rot and N₂-fixing and nitrifying organism communities



Effect of volatiles - concentration and exposure time



Effect of volatiles on oospores

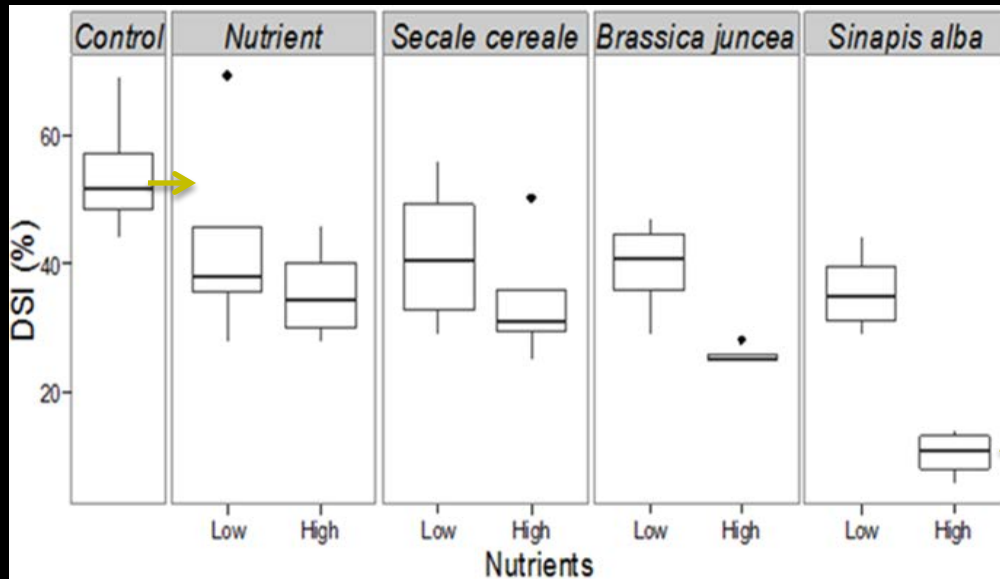


GSLs and ITCs

- The amount of GSLs in *S. alba* shoots is **2x greater** than in *B. juncea* shoots
- The GSLs in *B. juncea* shoots are dominated by aliphatic (**sinigrin**) which produce **allyl-ITC** after GSL hydrolysis
- The GSLs in *S. alba* shoots are dominated by aromatic (**sinalbin**) which produce **benzyl-ITC** after GSL hydrolysis



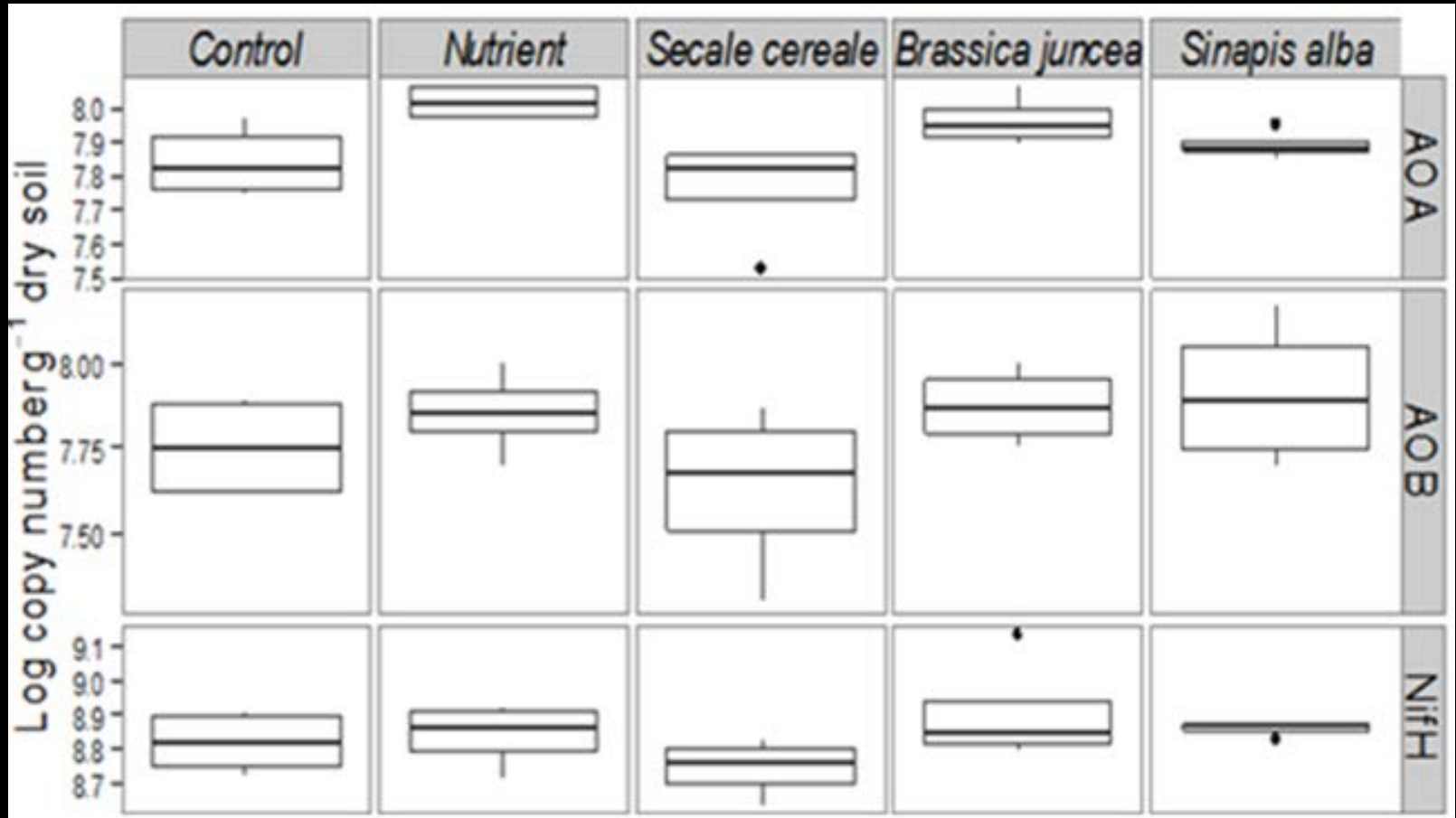
Root growth effect on pea root rot



ITCs

- *S. alba* root GSLs produced **3 times** more **aliphatic** ITCs than *B. juncea*

Root growth effect on N₂-fixing and nitrifying organism communities



Conclusions and remarks

- Aliphatic ITCs detected from *S. alba* root environment affected reduced pea root rot, but did not affect the N₂-fixing and nitrifying organism communities
- Aliphatic ITCs from *B. juncea* shoot tissue strongly inhibited *A. euteiches* in a closed system and reduced pea root rot.
- Effective ITCs, proper concentrations and sufficient pathogen exposure time are very important for potential bio-fumigation



N₂-fixing efficacy of rhizobia in different type of Swedish

Outline

- Rhizobium bacteria will be isolated from different soils, trapped by pea and faba bean plants
- Pea and faba bean seeds (3 + 3 cvs.) will be inoculated with isolated rhizobia
- Inoculated seeds will be grown in sterilized medium for 5 weeks
- Root and shoot growth of pea and faba bean will be evaluated



Thank You

