Biofumigation for the control of soilborne plant diseases

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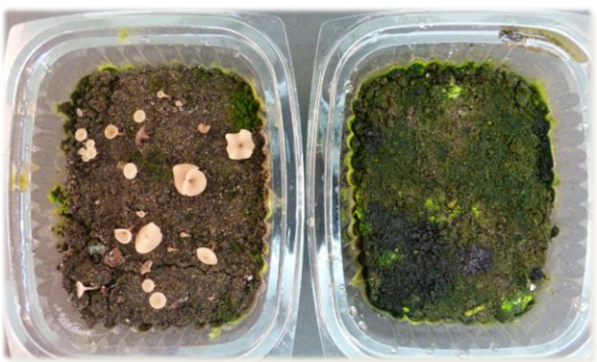
Background

- Biofumigation is a process where brassica or other green manure crops are grown, chopped and incorporated into soil with the aim of suppressing plant diseases.
- Leaves of certain brassicas contain glucosinolate compounds which are converted to fungitoxic isothiocyanates when crushed.
- Research is being carried out to assess the potential of biofumigation to control *Pythium violae* which causes cavity spot of carrot and *Sclerotinia sclerotiorum* causing Sclerotinia disease on a wide range of crops.

Cavity spot of carrot **Sclerotinia disease of lettuce**

Sclerotinia sclerotiorum

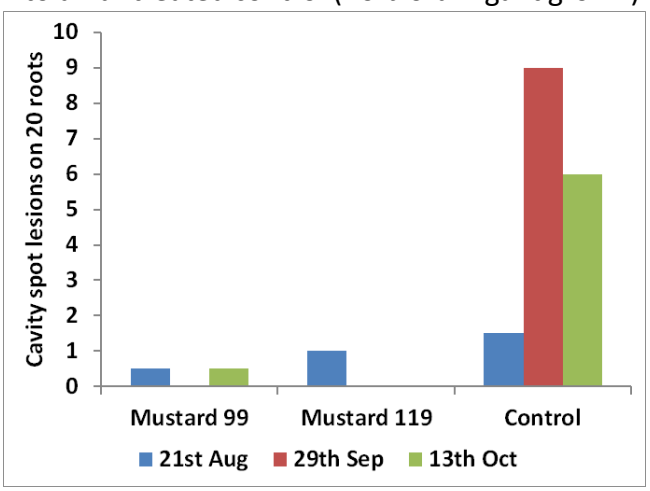
- *S. sclerotiorum* produces sclerotia (resting bodies) which survive in the soil for many years. These germinate to produce mushroom-like apothecia.
- A range of biofumigants were shown to suppress production of apothecia in small scale experiments where treatments were incorporated into compost and sclerotia buried.
- An oilseed radish resulted in the greatest reduction in germination of all the biofumigation treatments.



Production of apothecia by *S. sclerotiorum* in untreated (left) and biofumigant treated compost (right).

Pythium violae

- *P. violae* survives in the soil as oospores.
- Two Caliente mustards were grown in the field and chopped and incorporated at flowering before a carrot crop was sown.
- Both mustard types reduced cavity spot compared to an untreated control (no biofumigant grown).



Effect of brassica mustards on number of cavity spot lesions on carrots.