Persistence of Inoculum of *Aphanomyces cochlioides*

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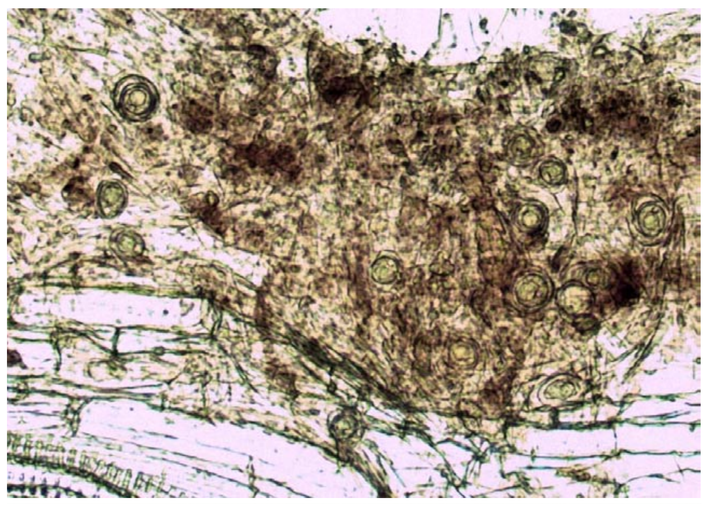
Introduction

Sugar beets in the Nordic countries may be infected by several different soil-borne pathogens. The most devastating is *Aphanomyces cochlioides* which is causing damping off and root rot. This pathogen produce persistent oospores which can remain viable in the soil for several years. Other pathogens frequently found are *Pythium* spp., *Fusarium culmorum*, *F. redolens* and *F. oxysporum*.

The interval between sugar beets in Sweden is between three to five years and the rotation includes winter wheat, barley, oil seed rape and sometimes also peas.

The aim of this study was to assess changes in disease severity (DSI) the years following after cultivation of sugar beets.



The resting spores (oospores) of Aphanomyces are very persistent and can be viable after several years.

An infection of Aphanomyces reduces growth and may cause high yield losses and problems with weeds.

Materials and methods

We repeatedly sampled 74 GPS positioned field plots (20 x 20 m) in Sweden each spring during 2003–2008. The soils were tested for soil-borne pathogens in a bioassay. Pathogens on the seedling roots were isolated and identified. The crop rotation during the last ten years (1998–2008) of each field was recorded.

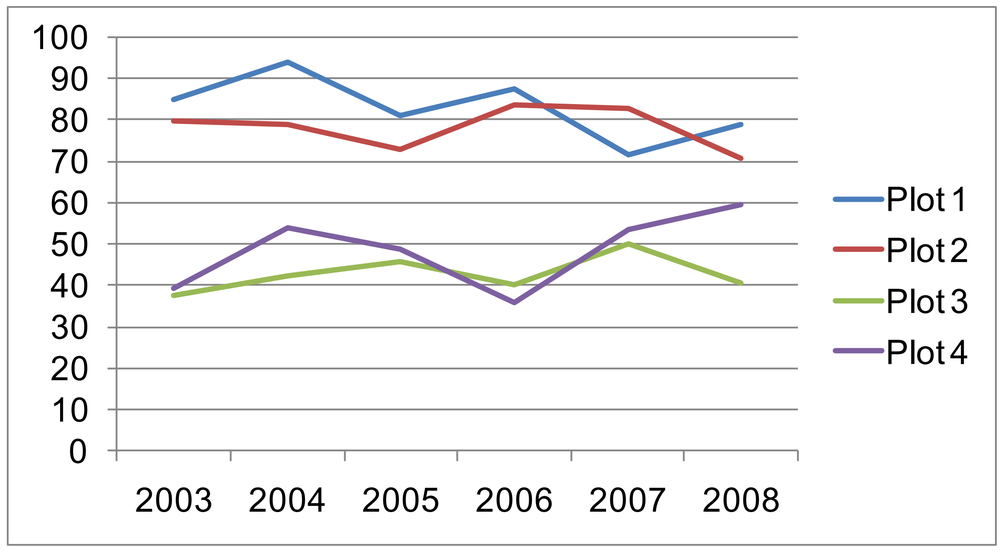
The soils are sown with sugar beet in pots in six replicates in a bioassay and the infection of the roots are assessed after four weeks.

The plants are washed and the infection is assessed in water.

Results and Conclusions

The DSI increased with in average 29% during the year of sugar beet cultivation. After four years of cultivation of other crops the DSI had decreased with 6,6% and after five years the decrease was 7,5%.

When *A. cochlioides* was present in the soil, the infestation level remained high despite long intervals between sugar beet crops. In these fields, tolerant varieties, chemical seed treatment, application of lime, and soil drainage are necessary control methods to reduce the risk of Aphanomyces root rot.



Changes in disease severity in four repeatedly tested field plots from 2003 to 2008. Sugar beets were cultivated 2003. Crops grown in the plots are shown in the table below.

	2003	2004	2005	2006	2007	2008
Plot 1	Beets	Potatoes	Potatoes	Rye	Barley	Barley
Plot 2	Beets	Barley	Wheat	Beets	Barley	Peas
Plot 3	Beets	Barley	Wheat	Peas	Rape	Wheat
Plot 4	Beets	Barley	Wheat	Wheat	Beets	Peas

The data also indicated that *F. culmorum* was less prevalent in a diversified crop rotation with, in addition to cereals and sugar beets, also oil seed crops and legumes.

Fusarium culmorum is present in several soils and may infect drought stressed sugar beets in August-September.

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