



## NJF Seminar 389

**Pest, disease and weed  
management in strawberry –  
progress and challenges for the  
Nordic production**

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## ***Colletotrichum acutatum*: survival in plant debris and infection on alternate hosts**

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Anthracnose of strawberry, caused by *Colletotrichum acutatum*, was introduced to Finland in plant material and can be a high risk for strawberry plantations. *C. acutatum* is a quarantine pest on strawberry within the European Union. In Finland, whenever a *C. acutatum* infection is detected, the infected plants are destroyed to avoid further spread of the pathogen.

The survival of *C. acutatum* in infected plant material was studied in two trials: one in 2002-2003 and another in 2003-2005 with artificially infected strawberry leaves, crowns and berries. The nylon mesh bags with artificially infected plant debris were placed in plastic buckets filled with sandy soil: in 2002 on the soil surface and at depths of 9 and 15 cm, in 2003 on soil surface and 10 cm deep. The buckets were placed outdoors, in 2002 also in an unheated greenhouse. In the first trial the bags were removed from the buckets in May, June and July 2003; in the second trial in August 2004, June 2005 and September 2005. The material from the bags was used to inoculate young strawberry plants in a greenhouse. Soil samples were taken in July 2003 and May 2004 from a field (MTT Horticulture, Piikkiö, Finland) where naturally infected strawberry plants had been destroyed by burning in July 2002. Samples were taken from soil surface and 5 cm below surface. Bait plants were planted in the soil samples. Petiole bases and crowns of bait plants were sampled for PCR.

*C. acutatum* was found to cause symptoms on strawberry plants when debris was collected after the winter in the first trial. The fungus was successfully isolated also from petioles and runners of bait plants. In the second trial, according to the result of the PCR test, *C. acutatum* survived two winters (2003-2005) in artificially infected plant residues on the soil surface, although the plant debris did not cause visual symptoms on the bait plants.

Positive PCR results were also obtained from bait plants grown in soil taken from the field where infected plants had been destroyed one and two years earlier. The low soil temperatures during the winter might have enhanced the survival of the fungus even without debris. The two-year survival of *C. acutatum* in soil may be due to survival of fungal structures or presence of latent infections in alternate hosts.

Five weed species were included in a preliminary study to determine how *C. acutatum* infects plants in a greenhouse test. The species, *Matricaria inodora*, *Stellaria media*, *Lapsana communis*, *Chenopodium album* and *Senecio arvensis*, were grown from seed in a greenhouse and the plants were inoculated with *C. acutatum* spore suspension. Four weeks later, samples were taken from stem bases, mature leaves and young leaves from shoot tops. Nearly all the samples from older plant parts had *C. acutatum* infection and the fungus sporulated in the necrotic lesions of the leaves.

*C. acutatum* could infect all these weed species and also spread to young growing shoots developed after inoculation. Long-term trials have, however, not yet been conducted on weeds. The weed species common on strawberry fields are of special interest. It is also important to determine the possible role of perennial species in the overwintering of *C. acutatum* and further infection of strawberry plants when the pathogen is controlled.