From Forest Nursery Notes, Summer 2008

101. © Infection of Norway spruce container seedlings by *Gremmeniella abietina*.
Petaisto, R. L. Forest Pathology 38:1-15. 2007.

For. Path. 38 (2008) 1–15 doi: 10.1111/j.1439-0329.2007.00524.x

Infection of Norway spruce container seedlings by *Gremmeniella abietina*

By R.-L. Petäistö

Finnish Forest Research Institute, Suonenjoki Research Unit, 77600 Suonenjoki, Finland.
E-mail: raija-liisa.petaisto@metla.fi

Summary

First- and second-year containerized Norway spruce seedlings were inoculated with conidia of type A (large tree type) and type B (small tree type) of *Gremmeniella abietina* var. *abietina* at different times during the summer. The appearance of symptoms after artificial inoculation and natural infection on spruce seedlings were recorded the following spring and compared with the disease symptoms on Scots pine seedlings. The proportion of diseased seedlings after inoculation reached as high as 80%. The susceptible period during the summer began later on the first-year seedlings than on the second-year seedlings, and was similar for the pine seedlings. Susceptibility of first-year seedlings was highest in August and on second-year seedlings in July. The accumulated temperature sum, relative humidity and height growth for first- and second-year seedlings was assessed. Natural infection in 2002 caused more disease on pine than on spruce seedlings. Experimental thinning of seedlings had no effect on disease incidence.

In a preliminary comparison between the ability of A and B types to cause disease in Norway spruce seedlings, type B caused more damage than type A after inoculation. However, type A caused a high disease frequency in other experiments in this study.

Symptoms on Norway spruce seedlings often first occurred in the mid-section of the shoot, and were similar to those observed on pine seedlings: needles turned brown, starting at the needle base, in the spring following inoculation. On first-year spruce, diseased needles were shed rapidly, in contrast to a slower rate of shedding on first-year pine seedlings. Pycnidia developed about 2 years after inoculation (on pine 1 year after inoculation). On Norway spruce seedlings the lower part of the shoot, including the lateral shoots, often remained alive.

The experiments show that *G. abietina* can cause disease on containerized Norway spruce seedlings under nursery conditions in Finland. The coincidence of spore dispersal, seedling susceptibility and predisposing factors are important in disease development.

1 Introduction

Gremmeniella abietina (Lagerb.) Morelet (imperfect stage *Brunchorstia pinea* (Karst.) Hohn.) causes Scleroderris canker on conifers, especially on pines. In Fennoscandia there are two types of *G. abietina* var. *abietina*: A (large tree type) and B (small tree type). Both types cause disease on seedlings and on the lower part of the trees; the A type also attacks the upper crowns of large trees (Uotila 1983; Hellgren and Högberg 1995; Petäistö et al. 1996). Damage caused by *G. abietina* is common on pine seedlings in nurseries (Kurkela 1967; Skilling 1969; Jancarik and Urosevic 1973) and symptoms are usually typical. The fungus was described on Norway spruce (*Picea abies* (L.) Karst.) by Lagerberg (1913). Since then there have been several reports and studies on the disease occurrence on spruce in Europe (e.g. Gremmen 1972; Roll-Hansen and Roll-Hansen 1973; Barklund and Rowe 1981; Barklund and Unestam 1988; Solheim 1986; Kaitera et al. 2000).

Received: 6.4.2006; accepted: 12.3.2007; editor: E. Donaubauer