

# Actual and new needle diseases of Christmas trees in Austria



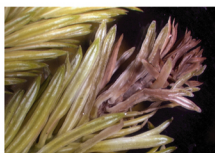
Production of Christmas trees in Austria has increased enormously in the preceding 20 years. At present, Norman's fir (*Abies nordmanniana*), the main conifer species used for Christmas trees, is widely cultivated in Austria. Seeds as well as plants are imported from various European countries. Seeds of *Picea*-species are commonly imported from North America.

There is nearly no propagation of Christmas-tree seeds in Austria, especially not of Norman's fir and other firs.

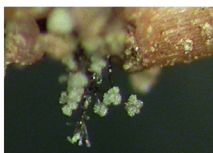
The fact, that Christmas trees are cultivated as monocultures and the intense import of plant material are a high risk for the invasion and spread of harmful pathogens.



Fir: intense shoot blight by *Botrytis cinerea*



*Botrytis cinerea*: initial symptom: wilt of a young shoot in May



*Botrytis cinerea*: conidiophores

## Grey mould (*Botrytis cinerea* Pers.)

Grey mould infects many hosts, in Christmas tree plantations it is the most common fungal disease and requires control measures nearly every year.

Young needles and shoots are infected at the time of flushing or shortly afterwards and die off. Consequences are growth anomalies, which may affect the shape of the tree.

Grey mould infections occur, if the climate is cool and humid in May, leading to epidemic spread within short time, especially in monocultures of firs. In addition, also the site climate may favour the disease: moist depressions, dense planting and high grass are factors, which should be avoided in Christmas tree production.

In 2004, Grey mould was a widespread problem in Christmas tree production (Burgenland, Styria), as a consequence of the high precipitation and low temperatures in May and June of that year.

## Kabatina needle blight (*Kabatina abietis* Butin & Pehl)

Symptoms of this fungal disease – reddening of the distal half of needles of the current year – have been observed in Austria from 1982 on. Main areas are the South of the Waldviertel and the Burgenland.

1993 the species was described as new *Kabatina* species in Germany.

In Austria, it was originally only a problem for *Abies grandis*, but now it occurs also on Norman's fir. Needles stay half green and half red for a time, before they are shed.

*Kabatina abietis* is known only from Europe, though the symptoms are also observed on other continents.

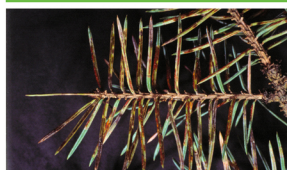
Recent studies in Norway and in Austria indicate that this symptom, however, may be produced by other microfungi as well.



*Kabatina abietis*: scattered needles, distal part discolored



*Kabatina abietis*: fruiting bodies (acervuli)



*Chrysomyxa abietis*: telia



*Pucciniastrum epilobii*: aecia



*Chrysomyxa rhododendri*: aecia showing white peridia

## Rusts

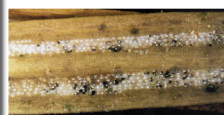
*Chrysomyxa abietis* (Wallr.) Unger,  
*Chrysomyxa rhododendri* (DC) De Bary  
*Pucciniastrum epilobii* (pers.) Oth.

In Austria, needle rust of spruce (*Chrysomyxa abietis*) is the most common rust species infecting Christmas trees. Since *Picea pungens*, the main host, has got out of style as a Christmas tree, this rust is observed more rare than 20 years ago.

*Chrysomyxa abietis* is an autoecious species on *Picea pungens* and other spruces. The heteroecious species *C. rhododendri* infects Norway spruces in high altitudes, if there are shrubs of alpine Rhododendron-species growing nearby.

A rather common species is *Pucciniastrum epilobii*, alternating between various fir species and species of *Epilobium*, where Uredia and Teleutospores develop.

This needle disease can be observed frequently in the Waldviertel, where high numbers of *Epilobium* grow in the understory of the forests.



*Rhizosphaera* sp.: fruiting bodies emerging from the stomata on the lower needle surface



*Lirula macrospora*: ascomata on previous years needles



*Lirula macrospora*: violet-red needle discoloration of blue spruce

## Needle cast fungi

**Lirula needle cast (*Lirula macrospora* (R.Hartig)Rehm))**

***Rhizosphaera kalkhoffii* Bubák**

***Rhizosphaera oudemansii* Maubl.**

***Phaeocryptopus nudus* (Peck) Petr.**

Lirula needle cast is commonly spreading epidemically in *Picea pungens* plantations (Perry et al. 2002). Other than on Norway spruce *Lirula macrospora* infections lead to a violet discoloration of the previous years needles, where the anamorph develops. The teleomorph appears on the already yellow needles shortly before they are shed. Lirula-needle cast is known from Austria for a long time, and was previously described as *Coccigloium microsporium* (Petrak 1955).

*Rhizosphaera kalkhoffii* – needle cast is a rather rare phenomenon as a epidemics on spruces. The fungus is very common on needles dying off following insect damage or, more common, frost damage. The same refers to infections by *Rhizosphaera oudemansii* on firs. In Northern Europe, *Phaeocryptopus nudus* recently has become a problem in Christmas tree plantations (Talgå & Stensvard 2003b). In Austria, this species has not been found so far.

### Literatur:

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## *Thysanophora penicillioidea* (Roum.) Kendrick

Since 2004, several incidences of needle cast in *Abies nordmanniana* were associated with intense fruiting of the hyphomycete *Thysanophora penicillioidea*, which is known as a common saprophytic fungus. A similar phenomenon was observed in Norway at about the same time (Talgå & Stensvard 2003a).

*Thysanophora penicillioidea* is a typical species contributing to the decomposition of conifer needles (Rack & Butin 1984). Shedding of green or partly green needles with masses of *Thysanophora* conidiophores in addition to damage by sucking gall mites indicates pathogenic qualities of this fungus under circumstances not yet known.



*Thysanophora penicillioidea*: conidiophores

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