From Forest Nursery Notes, Summer 2008

106. © Pathogenicity of *Fusarium verticillioides* and *Fusarium oxysporum* on *Pinus nigra* seedlings in northwest Spain. Martin-Pinto, P., Pajares, J., and Diez, J. Forest Pathology 38:78-82. 2008.

For. Path. 38 (2008) 78–82
doi: 10.1111/j.1439-0329.2007.00522.x

Pathogenicity of *Fusarium verticillioides* and *Fusarium oxysporum* on *Pinus nigra* seedlings in northwest Spain

By P. Martín-Pinto[1,2], J. Pajares[1] and J. Díez[1]

[1]Forest Entomology and Pathology Laboratory, Department of Vegetal Production and Forest Resources, Universidad de Valladolid (Palencia), Avda, Madrid 44, 34071, Palencia, Spain.
[2]E-mail: pmpinto@pvs.uva.es (for correspondence)

Summary

Fusarium verticillioides may be responsible for causing significant damping-off damage similar to that incited by *F. oxysporum* on forest seedlings, resulting in considerable losses in nurseries in northwest of Spain. Traditionally, *F. oxysporum* has been considered the most important agent of this disease in Spanish forest nurseries. However, recent studies have showed that *F. verticillioides* also has been frequently isolated from diseased plants. This has increased the necessity for a more comprehensive knowledge of the behaviour and pathogenicity of both *Fusarium* spp. isolated from these sites. The effect of *Fusarium* spp. on seed germination and on seedling mortality was analysed by inoculating the fungus at seeding. The *in vitro* growth of the two species was studied and is discussed in relation to *in vivo* virulence. Both species caused a reduction in seed germination and an increase in seedling mortality. Mortality caused by *F. verticillioides* treatments occurred sooner than that for *F. oxysporum* and the growth rate of *F. verticillioides* was also greater.

1 Introduction

The survival and early growth of plants used in reforestation depend mainly on the physiological quality of the seedlings produced in the nurseries. Being adaptable to different environmental conditions, *Fusarium* spp. are widely distributed across the world, and are well-known as nursery pathogens, causing pre-emergence and post-emergence damping-off as well as decreasing seed germination in coniferous nurseries.

Although *F. oxysporum* has been considered as the most important pathogenic species in Spanish forest nurseries (Soldevilla 1995), *F. verticillioides* (Syn: *F. moniliforme*) can also cause significant damage on conifer seedlings. This species has recently been reported from *Pinus strobus* seeds (Ocamb et al. 2002) and associated with rhizosphere soil and diseased roots of *P. strobus* (Ocamb and Juzwik 1995). The presence of *F. verticillioides* in diseased *Pinus nigra* seedlings growing in nurseries located on the Northern plateau of Spain (Castilla and León Autonomous Community) was previously reported (Martín-Pinto et al. 2004), although more detailed knowledge of the behaviour of this potential pathogen is required.

The relationship between *in vitro* mycelial growth of certain fungal species and their virulence on host plants was previously reported (Brasier et al. 1981). Thus, knowledge of possible relations between these features in *Fusarium* isolates could be of great value in developing integrated management of these pathogens in forest nurseries.

The objectives of this research were to: (i) evaluate the effects of *F. verticillioides* on seed germination and seedling mortality of *P. nigra*; (ii) compare these effects with those caused by *F. oxysporum*; (iii) compare the *in vitro* mycelial growth of the studied species; and (iv) determine if relationships between virulence and mycelial growth do exist.

Received: 16.10.2006; accepted: 22.8.2007; editor: J. Stenlid