

Resistance induction to pine wilt disease in four month old seedlings of *Pinus* spp. by inoculation with an avirulent nematode strain: case study

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Pine wilt disease, caused by a pine wood nematode (PWN) *Bursaphelenchus xylophilus* (Steiner and Buhner) Niclke, is seriously infecting *Pinus pinaster* trees. PWN infections are detected once external symptoms are observed (i.e. chlorosis of the needles), but pine trees could be asymptomatic and serve as a long-term host. Recent studies have demonstrated that tree resistance may be induced by inoculating seedlings with avirulent PWN strains. Although the development of disease and host response has been determined, the resistance mechanisms and plant expression remains unknown. Moreover, it is not known if this avirulent nematode, which has proved to be innocuous for Japanese red pine and black pine, is also avirulent with other *Pinus* species, in particular *Pinus pinaster*. The primary goal of this work was to assess the effect of the inoculation of an avirulent isolate of *B. xylophilus* (C14-5) on different *Pinus* spp. seedlings (*P. sylvestris*, *P. nigra*, *P. pinea* and *P. pinaster*). In parallel, seedlings were also inoculated with a virulent strain to compare the effects between the two strains of nematodes. The resistance mechanisms of PWN were assessed during the first stages of infection. The effect of seedling inoculation was determined in terms of the expression of several *Pinus* genes potentially involved in the disease response. Finally, PWN progression was also monitored to confirm successful seedling inoculation.