



## **Foliar, Shoot, Stem and Rust Diseases of Trees**

Jointly organized by IUFRO working parties

"Foliage, shoot, and stem diseases" (7.02.02) and "Rusts of Forest Trees" (7.02.05)

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**University of New Hampshire, Durham, New Hampshire, USA**

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## Thousand cankers disease of walnut in Europe: impact, diagnosis and control

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Thousand cankers disease (TCD) causes branch dieback and mortality of walnut, especially black walnut (*Juglans nigra*) in natural forests, plantations and ornamental greenery. The disease is the result of the aggressive feeding by the bark beetle *Pityophthorus juglandis* on walnut trees and the subsequent development of a multitude of coalescing cankers by the ascomycete fungus *Geosmithia morbida* around beetle galleries. First originated in the western US, TCD then spread into the native range of black walnut in eastern US, and more recently arrived in Europe, Italy being currently the only European country where TCD is reported. The impact of this insect-fungus complex has been devastating in some black walnut plantations in the north-central part of the country. Both the symbiont fungus and its beetle vector are regulated as quarantine organisms in Europe (A2, EPPO List), hence the immediate eradication of new TCD outbreaks is a priority. Simple, accurate and repeatable molecular diagnostic protocols were developed for a prompt identification of both TCD complex members from various organic matrices. These assays, based on duplex real-time PCR, SYBR Green qPCR and LAMP, could validly support phytosanitary services in surveillance campaigns. In fact, being both members of the TCD pest complex difficult to identify with traditional methods, the use of molecular tools could assist in the phytosanitary inspection of import/export plant material as well as of plantations, nurseries and urban greenery.