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# URBAN FORESTS AS NATURE-BASED SOLUTIONS

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# Impact of thousand cankers disease of walnut on the urban greenery and proactive management

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## Abstract

Black walnut is a valuable ornamental and timber tree of North American origin, extensively planted in Europe in the urban greenery since the end of the 17<sup>th</sup> century and, in recent decades, in woody plantations. This species began to show symptoms of widespread decline in the USA starting from the early 2000s. About ten years later (2011) an insect-fungus disease complex was identified as the cause of tree mortality. The agents responsible for this disease, called 'thousand cankers disease' (TCD), are the fungus *Geosmithia morbida* and, its vector, the beetle *Pityophthorus juglandis*. After a few years, the disease was also reported in Italy, the only country outside the USA where TCD is currently present. With both the fungal pathogen and its vector categorised as quarantine organisms in Europe, regulatory measures against them are compulsory. Italy is therefore the only European country that is currently facing the problem of TCD management. A different approach to this phytosanitary issue is needed in Italy (and Europe) compared to the USA. In fact, while in North America natural forests of black walnut have a high ecological and economic value, in Europe this is an introduced species. Therefore, it is not present in natural woods. The effort in the Old Continent must be aimed at eradicating existing TCD outbreaks and preventing new introductions. Here we report the management strategies that have been implemented in order to control the disease in Tuscany, particularly in the urban area of Florence, where the pests have been recently detected. Management efforts include: i) the development of fast and accurate diagnostic protocols; ii) phytosanitary surveillance at vulnerable sites (ports, airports, plant nurseries, wood-processing companies, loading stations); iii) monitoring of the territory for the detection of new disease foci at an early stage; and iv) disease eradication campaigns. Furthermore, since black walnut often grows in parks and public gardens, citizen science could validly support professionals in the early detection of new disease outbreaks

