

A Set of Complementary Technical Systems (CTS) for Comprehensive Control of Pine Wilt Disease in South China

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Abstract

This article condenses the practical technical system and its output for controlling pine wilt disease (PWD) in China. PWD caused by *Bursaphelenchus xylophilus* is responsible for huge pine tree mortality in conifers forest. ‘Vector beetle - pathogenic nematode - pine tree’ are the key factors in the disease epidemic system of PWD. Therefore, a set of a set of Complementary Technical Systems (CTS) for comprehensive control of PWD has been used for more than 20 years in south China. The key points are to employ technical qualified companies to remove the weak and dead trees in the infected forest. Use fumigants to kill the vector longicorn beetle in the deadwood, spray chemical or biological insecticides and/ or use traps to kill live beetles in the forest, and use lure wood to centralize the eggs deposit of longicorn beetles. Based on the biological and ecological characteristics of beetle and mode of disease dissemination, the killing of *Monochamus alternatus* is the necessary functional way to stop the disease spread. The complementary control measures have the potential in reducing the population density of *M. alternatus*, and play the cumulative effect of reducing the population density in different biological periods with a continuous, effective, and coordinated manner. Within three consecutive years of performance-based contracting projects, the incidence rate of pine wood nematode disease has been reduced to less than one in 10,000, reaching the level of no disaster, and the control cost has been reduced to an average of less than 1000 RMB per hectare. To our knowledge, it is the first report of the complementary technical system for comprehensive control of pine wilt disease in south China.

Keyword: PWD, Complementary Technical Systems, *Monochamus alternatus*, Trapping.

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