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## **(171) The Dutch approach to Pine Wilt Disease (PWD): longhorn beetles and nematodes under surveillance**

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Climatic conditions in the Netherlands are similar to those of the area of pine wood nematode (PWN) distribution in North America. Environmental conditions in North America are generally unsuitable for pine wilt expression (Evans *et al.* 1996). According to this study, below the summer isotherm of 20 degrees expression of pine wilt disease (PWD) is not expected. It is, therefore, presumed that infested trees in the Netherlands will not express symptoms. The absence of symptoms makes it difficult to design a survey on basis of early detection without analysing a large number of samples. We explored experiences and investigations of other European countries without conditions for PWD expression (Magnusson *et al.*, 2007; Magnusson, 2009; Schröder *et al.*, 2009), to clarify the possibilities for a survey strategy in the Netherlands.

Since the Netherlands are a major importer and exporter of products, the establishment potential of PWN (*Bursaphelenchus xylophilus*) is foremost determined by the possible introduction of infested longhorn beetles *Monochamus* in wood or wood packaging material (WPM). Therefore, the Netherlands opted for a similar strategy as other European countries where PWD symptoms are not to be expected. The monitoring of PWN and *Monochamus* in the Netherlands is mainly based on surveys at locations where wood and/or wooden products (bark, wood chips, lumber, packaging), originating in countries where PWN occurs, are imported or stored. Additionally surveys are carried out for the vector in the rest of the Netherlands.

Each year, our survey plan for the Netherlands consists of 7 parts, which are as follows:

1. On high risk locations *Monochamus* pheromone traps are used at the site itself. When longhorn beetles are found, they are analysed for the presence of nematodes. Dead or dying trees at a distance of 50 to 100 m are inspected for beetle activity. In collaboration with the European Invertebrate Survey (EIS-NL) at 10 selected locations with 3 pheromone baited traps each, the presence of *Monochamus* populations is monitored in nearby forests or groups of host plants (beyond 100 m).
2. Random survey of forest areas for the presence of *Bursaphelenchus* species in dead or dying trees.
3. Monitoring programme of wood packaging material originating in countries where PWN is known to occur.
4. Sampling and testing of coniferous wood (including chips, particles, shavings, etc.) originating in countries where PWN is known to occur.
5. Sampling and testing of coniferous bark originating in Portugal.
6. Monitoring and sampling of potted plants with coniferous bark used as mulch coverage originating in Portugal.
7. Inspection and sampling of plants for planting of *Chamaecyparis*, *Pinus* and *Juniperus* originating in Japan and South Korea, with reference to Commission Decisions 2002/887/EC and 2002/499/EC.

Results of our surveys from the last five years will be presented. PWN, *Bursaphelenchus xylophilus*, has not been found in the Netherlands so far, although it has been recorded once from imported wood. In imported bark only *B. fungivorus*, *B. minutus* and *B. sexdentati* have been found. Its vector, *Monochamus* spp., has been found in imported wood package material or other wooden products. Surveys performed in The Netherlands show that a small population of *M. galloprovincialis* is persistent in a small pine wood forest near the coast (3x5 km), whereas it is absent in all other parts of the Netherlands.

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