Import-inspections, surveys, detection and eradication of the longhorn beetles *Anoplophora chinensis* and *A. glabripennis* in The Netherlands

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Introduction

Since 1980 The Netherlands has regularly intercepted the citrus longhorn beetle *Anoplophora chinensis* on consignments of bonsais and plants for planting coming from China and Japan. Two local outbreaks have been detected since 2007 on trees and shrubs outside nurseries. The first one was found in Westland (a greenhouse area) in December 2007 and the second one in Boskoop (a tree nursery centre) in November 2009, about 30 km apart. In 2010 another outbreak, which was related to packaging material, was found in the city of Almere.

Materials and methods

Measures were taken in line with the Commission Decision 2008/840/EC, including the demarcation of the infested zone and a buffer zone with a radius of 1 km. Upon first detection, all trunks of trees and shrubs were examined for presence of *A. chinensis* by cutting the lowest (1 m) part of the trunk into pieces of about 10-15 cm. All exit holes were found on the lowest 40 cm of the trunk. To eradicate these outbreaks, in both areas all woody deciduous host plants were removed, examined and destroyed within a radius of 100 m around infested trees and surveys were performed in an area of 1 km radius. In both areas, all host plants present within a radius of 200-300 m were removed as well. Upon the uprooting of the trees, the age of exit holes was determined.

In Westland, about 110 trees and 1400 shrubs were removed including several known host plant taxa such as *Acer* spp. (~25 trees), *Aesculus hippocastaneum* (7 trees), *Salix* spp. (17 trees) and about 40 *Rosa* shrubs. Following removal and examination of all broadleaved trees and undergrowth bushes within the first 100 m, 28 larvae and 24 exit holes in total were detected in 11 shrubs and trees (7 *Acer*, 1 *Coryllus*, 2 *Cornus* and 1 *Crataegus*). During this action, all infestations were found within a 35-m distance from the nursery and no infested plants or plants with symptoms (exit holes, frass, T-shaped cracks in the bark, discolouration of stems, signs of feeding on twigs) were found.

In the Boskoop area, 7 exit holes were detected in 2 old dead stumps of *Acer palmatum* and 1 exit fresh hole and 2 full-grown *Anoplophora larvae* in a *Carpinus* tree at the nursery entrance. All neighbouring plants were removed and checked for the presence of *A. chinensis* and a similar procedure and method were followed to survey the demarcation zone as used in Westland. In total, 344 nurseries, 6700 private gardens and all trees on 1275 ha were inspected. Moreover, 316 trees, 809 m of hedgerow, 241 large shrubs (1.5 m or higher), 1291 small shrubs (smaller than 1.5 m) present in private and public areas, and about 5000 plants from 2 tree nurseries were removed and destroyed. No signs of the pest were found in any of the plants removed in the 100 m zone, nor during the surveys in the 100-200 m zone.

In The Netherlands, wood packaging material is inspected on a regular basis at the ports of entry, *e.g.* harbour, import locations, etc. *Anoplophora glabripennis*, the Asian longhorn beetle, was first intercepted from wood packaging material in July 2008. In November 2010, a first infestation was found on native host plants in an industrial area in the city of Almere. This infestation was related to pallets used for transport of industrial machinery. Upon first detection, surveys were performed in concentric zones of 100, 500 and 1000 m around outbreak using destructive sampling and tree-climber inspections. In the first 100 m, all deciduous trees and shrubs were cut, examined and destroyed. In total, 100 trees and shrubs were examined in detail: they were cut at the ground level, and the upper part – trunk and branches – was cut into pieces of 40-50 cm, inspected on for longhorn symptoms on the outside, their bark was peeled off and the wood was cut into small pieces. In case of atypical infested trees, the complete tree was uprooted and examined. Ten trees (1 *Salix*, 9 *Acer*) were found infested within an area of 70 m distance. In total, 60 exit holes (1 *Salix*, 59 *Acer*) were found, as well as 11 (2 live, 9 dead) *A. glabripennis* adults, 7 *Anoplophora larvae* and 600 oviposition pits (feeding scars). No eggs, larvae or scars were found dating from 2010. Analysis of the age of the exit-holes and scars on infested trees allowed us to date longhorn outbreaks with high precision.

Results

In both Westland and Boskoop no *Anoplophora* infestations have been found further away than 30-40 m from the original source of infestation. In the follow-up surveys, no signs of the pest have been found until now. Surveys will be performed until 2013 at least.

Furthermore, investigations on exit-holes and scars in the Almere area showed that almost all exit-holes were formed between 2005 and 2010 and most oviposition pits between 2004 and 2007. All symptoms were formed at end of the growing season. Surveys will continue until 2014.