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European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

PM 9/15 (1)

National regulatory control systems
Systèmes de lutte nationaux réglementaires

PM 9/15 (1) *Anoplophora glabripennis*: procedures for official control

Specific scope

This Standard describes the procedures for official control with the aim of containing and eradicating *Anoplophora glabripennis*.

Specific approval and amendment

First approved in 2013-09.

Introduction

Anoplophora glabripennis (EPPO Code: ANOLGL), the Asian longhorn beetle, is on the EPPO A1 List of pests recommended for regulation. It is native to China, Democratic People's Republic of Korea and Republic of Korea. *Anoplophora glabripennis* is highly polyphagous with hosts in many genera of plants. *Acer* spp., *Populus* spp., *Salix* spp. and *Ulmus* spp. (Herard *et al.*, 2009) are preferred hosts; other known hosts include *Aesculus* spp., *Albizia* spp., *Alnus* spp., *Betula* spp., *Carpinus* spp., *Fagus* spp., *Fraxinus* spp., *Morus* spp., *Platanus* spp., *Prunus* spp., *Pyrus* spp., *Robinia* spp., *Rosa* spp., *Sorbus* spp. and *Sophora* spp. Many of these hosts are widely distributed in the EPPO region. For a fuller host plant list, see Appendix 3.

In China, *A. glabripennis* has been an important pest, particularly of amenity poplar plantations (Yan, 1985). Trees are weakened by larval attack and are often seriously damaged and sometimes killed. Damage to small, young trees tends to be most severe (Lieu, 1945; Kojima & Hayashi, 1974). The adults can also cause damage by feeding on leaves, petioles and bark. Damage to ornamental and fruit trees in particular results in economic loss.

The life cycle of *A. glabripennis* takes 1–2 years in its native area, and varies depending on climatic and feeding conditions (Hua *et al.*, 1992). Early stage larvae bore galleries in the cambium, while older stages tunnel through the heartwood. Prior to pupation, the larvae bore a pupal chamber just under the bark. Once the adult stage is reached, they remain immobile in the chamber for 7–10 days before finally emerging from perfectly round holes, typically 10–15 mm in diameter, but can range from 6 to 20 mm (Haack *et al.*, 2010).

Insect activity may be seen in the form of woody shavings (frass), which accumulate around the base of the trees and on branches and branch junctions; oviposition pits, from which sap may ooze; exit holes on branches and trunks; hollow bark and larval galleries; signs of adult feeding on twigs and petioles; and branch dieback (Herard *et al.*, 2009). Most symptoms tend to be found from approximately 1.5 m above ground up to the middle of the crown, but may also occur on stumps of freshly cut host trees.

The emerged adults feed on suckers and tender bark of young shoots (Maspero *et al.*, 2007). As is the case for other Cerambycidae, the adults are weak flyers, flying 30–225 m in a single flight (EPPO, 1999), thus their seasonal mobility tends to be limited to the same tree or short distances to nearby suitable trees. This being the case, natural spread is thought to be a slow process. The adults emerge between May and October and live for approximately 1 month (Li & Wu, 1993). Egg deposition begins a week after mating: small oviposition slits are chewed by the female, and are generally on the eastern side of the trunk or branches. The female lays approximately 32 eggs (Wong & Mong, 1986) one by one under the bark, and these hatch approximately 2 weeks later.

In respect to overwintering, the larvae of the closely related *A. chinensis* have been shown to survive temperatures of 0°C for prolonged periods, and outbreaks of the pest have been seen in areas where the minimum winter temperatures are well below zero. In Braunau (Austria), *A. chinensis* larvae survived winter temperatures lower than

−15°C (H. Krehan, pers. comm., 2011). The pest status of *A. glabripennis* in the EPPO region at the end of 2012 was as follows: Austria (present, few occurrences), Belgium (eradicated), Denmark (absent, intercepted only), France (transient, under eradication), Germany (transient, under eradication), Italy (present, few occurrences), the Netherlands (transient, under eradication), Sweden (absent, intercepted only), Switzerland (transient, under eradication) and the UK (transient, under eradication). The most important pathway for the introduction of *A. glabripennis* is the import of wood packaging material from areas where it is native. In contrast, the closely related species *A. chinensis* is associated more with the import of plants for planting. Since the larval stages of *A. glabripennis* occur generally higher up in the tree trunk and branches, sawn material used for wood packaging material may contain larvae. But all forms of untreated wood of host trees coming from areas where the pest is known to occur can be a potential phytosanitary risk. For details on *A. glabripennis* biology see the EPPO datasheet (EPPO, 1999).

Experience in the EPPO region has shown that for successful eradication of *A. glabripennis*, early detection and prompt effective action are key factors.

This Standard describes a national regulatory control system for the monitoring, eradication and containment of *A. glabripennis* and describes:

- elements of a monitoring programme to detect a new infestation or to delimit an infested area
- measures aiming to eradicate recently detected populations (including an incursion)
- containment measures to prevent further spread in a country or to neighbouring countries, in areas where the pest is present and eradication is no longer considered feasible.

Monitoring of *A. glabripennis*

Surveillance for the presence of *A. glabripennis* in a country or area not known to have Asian longhorn beetle is usually based on a detection survey (the method used for the detection survey is described in Appendix 1). If an infestation of *A. glabripennis* is found, a delimiting survey (at least 1 km radius around the tree(s) found infested) should be carried out to delimit the regulated area (see 'Eradication' and 'Containment') including the infested area (method used for delimiting survey is described in Appendix 2). Surveys should continue in the regulated area until *A. glabripennis* is eradicated.

If signs of *A. glabripennis* presence are found in imported wood packaging material, the location and surroundings (host trees) should be inspected intensively for the presence of the pest for at least 4 years. The collection and processing of samples is described in Appendix 1.

It is also recommended that actions to raise public awareness are undertaken by the NPPO.

Eradication of *A. glabripennis*

When a breeding population of *A. glabripennis* is detected in tree(s), cutting debris or waste wood, official eradication measures should be taken. The eradication process should include five main activities.

(1) Surveillance to investigate the distribution of the pest fully (see section 1 of Appendix 2).
(2) Measures to prevent the spread of the pest, including establishment of an initial regulated area of at least 2 km radius around the infested tree(s) and clear-cut area (see section 2 of Appendix 2).
(3) Control measures to eradicate the pest when it is found associated with wood, standing trees and plants for planting (see section 3 of Appendix 2).
    - Infested tree(s) should be felled immediately and, together with the cut waste and stumps, destroyed completely by chipping to fragments <2.5 cm in any dimension, preferably *in situ* or by burning. Where this is not possible (e.g. due to a high risk of fire), it should be carried out in the nearest appropriate location (avoiding any risks of *A. glabripennis* spread to non-infested areas). An intensive delimiting survey of at least 2 km radius around the positive tree(s) should start immediately. Additional findings of infested trees should result in an extension of the delimiting survey.
    - Depending on the results of the delimiting survey, a regulated area for application of containment and eradication measures should be established as follows:
        (i) for a localized, small infestation, the establishment of a 100-m-radius clear-cut area around the infested tree(s) should be considered;
        (ii) for a wider and more dispersed infestation, the edge of the known infested area should be delimited and at least a 100-m-wide clear-cut area around the edge should be established.
    - In both cases, the exact radius of the clear-cut area should be determined by the NPPO depending on the population of the pest and the presence and density of host plants. The felling of host species should be carried out from the outside of the area towards the centre. All trees, or at least a representative sample taken from the trees felled in the clear-cut area, should be examined for the presence of *A. glabripennis*. If any infestation is found, a further delimiting survey (as described above) should be carried out and a new clear-cut area established.
    - An intensive monitoring area at least 1 km wide around the edge of the clear-cut area should be set up. In situations where there are host trees, the regulated area should be defined (at least 1 km wide) to prevent movement of possibly infested material out of it. Analysis of the infestation chronology should be

used to decide the extent of the intensive survey area and regulated area.
- Exceptionally, if it is not possible to fell potentially infested trees in the clear-cut area for technical, ecological or administrative reasons, these trees should be inspected regularly by the NPPO, at least three times during the vegetation period and once outside this period.

(4) Verification of pest eradication: *A. glabripennis* can be considered eradicated when the following condition is fulfilled: no findings of *A. glabripennis* for two complete life cycles of the pest with a minimum of 4 years of annual monitoring and sampling in the regulated area.

(5) Activities to raise public awareness concerning the threat of *A. glabripennis* and the measures adopted to prevent its introduction into, and spread within, the country and EPPO region.

The aim of the measures applied within the regulated area is to limit spread within the regulated area, to prevent spread outside the regulated area, and to eradicate *A. glabripennis* by continually removing foci of infestation. Measures for preventing spread to other areas and for reducing infestation levels are described in Appendix 2.

Containment of *A. glabripennis*

In the case of an established population, when eradication is not considered feasible the aim is containment, using the following measures.

- Delimit a buffer zone with a radius of at least 2 km beyond the boundary of the infested area where containment measures should be applied.
- Ensure regular surveillance in the buffer zone.
- Ensure containment and suppression measures as follows.
  - (i) Felling at ground level of infested plants and plants with symptoms caused by *A. glabripennis*; during the flight period of the pest, felling activities should start immediately; however, in cases where infested plants were found outside this period, felling and removal should be carried out before the start of the next flying period. In exceptional cases where the NPPO concludes that such felling is inappropriate, an alternative containment measure may be applied provided it offers the same level of protection against the spread of *A. glabripennis*.
  - (ii) Removal, examination and disposal of *A. glabripennis*-infested material. Root material needs to be removed if larval galleries are found on the cut surface of the stump. Burning is the most effective way to destroy material, although chipping is also effective when the chipped fragments are less than 2.5 cm in any dimension. For stumps, grinding is also effective and often less time-consuming. All precautions should be taken to avoid spreading *A. glabripennis* after felling.
  - (iii) Prevention of movement of potentially infested material out of the regulated area.
  - (iv) Chemical control: appropriate treatments can be applied against *A. glabripennis*. Chemical insecticides may be used to kill adults directly and prevent them from ovipositing on specific trees (MacLeod *et al.*, 2002). For the closely related species *A. chinensis*, trunk applications of thiamethoxam (25% water-dispersible granules) may reduce the rate of oviposition and larval activity of young instars (Maspero *et al.*, 2007). Imidacloprid, a chemical with systemic properties and low mammalian toxicity, was under review in Canada for use as an integrated pest management (IPM) strategy, though there is little information available about its use in IPM (Canadian Food Inspection Agency, 2007). In the USA, this insecticide has been found to be effective against adults feeding on small twigs, against females when depositing eggs, and against young larvae. It is formulated for soil and trunk applications (USDA APHIS PPQ, 2008; Hu *et al.*, 2009; Haack *et al.*, 2010). Herbicide treatments may be used in situations where stump removal is difficult. Preventive chemical control measures with systemic insecticides may require several repeated applications depending on the active ingredients over the course of the oviposition period – May to October.
  - (v) Biological control: there are currently no biological control agents (BCAs) available for use against *A. glabripennis*, although there are presently ongoing research initiatives to identify biological control candidates (Herard *et al.*, 2006; Maspero *et al.*, 2007). If a suitable BCA is identified, it should be noted that biological control cannot ensure eradication and could be used only to slow down the spread of *A. glabripennis* and to suppress the pest population under containment programmes.
  - (vi) Intensive monitoring for the presence of *A. glabripennis* by annual surveys at appropriate times on host plants, including where appropriate targeted destructive sampling.
- Carry out activities to raise public awareness concerning the threat of *A. glabripennis* and the measures adopted to prevent its introduction into and spread within the country and the EPPO region, and the conditions regarding movement of host plants of *A. glabripennis* from the established regulated area.

Enquiries

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Appendix 1 – Detection survey in an area where *A. glabripennis* is not present

Regular detection surveys should be carried out in order to verify that a country is free from *A. glabripennis* (according to ISPM 4 *Requirements for the establishment of pest free areas* and ISPM 6 *Guidelines for surveillance*: FAO, 1996, 1997, respectively).

Time of survey

Surveys should be carried out at least twice a year, including times of year when: (i) activity of *A. glabripennis* is likely to be high (May–September), and (ii) symptoms can be detected easily because of the absence of leaves on trees (Mid-October–March). If it is not possible to survey during the main period of adult activity, inspection of trees can be carried out over the winter months, focusing on trees with signs of *A. glabripennis* activity. In Southern Europe, pupae are likely to be found during April/May; young larvae during June/July; and larger larvae in September/October. In Central and Northern Europe, the development of *A. glabripennis* may differ: for example, inspectors in Austria and Germany found first-instar larvae even at the end of October.

Material to be surveyed

Survey criteria to determine both presence and absence of *A. glabripennis* are based on the biological characteristics of the pest: they target trees (particularly above 1.5 m in height on trunks) and wood (such as cut stems, waste material and naturally occurring debris). Therefore information on the known distribution of host plants of *A. glabripennis*, wood processing facilities, wood packaging material import, handling and storage should be used when designing a survey strategy.

Surveys should be pathway-based, which will allow resources to be targeted to those pathways with the highest likelihood of *A. glabripennis* being present. The main pathways capable of carrying *A. glabripennis* are as follows, in order of importance.

(1) Wood packaging material, in particular associated with imports of stone or tiles from far Eastern countries, imported from countries where *A. glabripennis* is known to occur.
(2) Broadleaf round wood (and other types of wood with bark) imported from countries where *A. glabripennis* is known to occur.
(3) Broadleaf sawn wood with or without bark: if trees have been infested by *A. glabripennis* the pest may still be present in sawn wood, even if the outer layers with bark have been removed. Survey efforts should concentrate on wood processing facilities that are known to have processed wood from trees originating from countries and areas of current *A. glabripennis* distribution.
(4) Host plants for planting (including bonsai plants) imported from countries where *A. glabripennis* occurs: particularly trees greater than 1 cm in diameter may have been infested by *A. glabripennis*.

Surveys should focus on areas where companies involved in the trade or processing of high-risk material are located. The companies concerned are those involved in trade of articles accompanied by high-risk wood packaging material (e.g. stones and machinery), those importing wood and plants for planting of host species, or wood processing facilities that are likely to have received potentially infested imported material (stored logs or large chips >2.5 cm).

In these areas, surveys should preferably target hosts in:

- non-forest locations (e.g. parks, gardens, street trees)
- nurseries

- private gardens
- forest boundaries.

Methods of monitoring

Surveys methods could include the following.

- Identification of potential symptoms due to the tree's response:
  - sap oozing from oviposition sites and where larvae have pushed shavings through the bark
  - wilting or loss of foliage
  - tree death or partial death of aerial parts and branches
  - obvious signs of loss in vigour.
- Visual detection of evidence of *A. glabripennis* presence:
  - frass (wood shavings) from feeding- and exit-hole-boring activity
  - discoloration and deformation of bark on plants for planting (including bonsais)
  - *A. glabripennis* larval galleries and grub holes, by peeling off bark on wood to increase the probability of detection
  - approximately 10–15-mm-diameter exit holes (this is the typical size, but they may measure 6–20 mm)
  - flying beetles, beetles resting on sunny surfaces and signs of maturation feeding.
- Destructive sampling of material, carefully examining the trunk and higher woody branches for larvae.
- Use of sniffer dogs trained specifically for detection of *A. glabripennis* presence in small plants and wood.
- Use of sound detectors for larval feeding where the NPPO concerned considers these are sufficiently reliable.

Often trees, even those with high levels of infestation by *A. glabripennis,* do not show any symptoms of defoliation or reduced vitality. It may take several years and generations of adult activity on an individual host before such symptoms become apparent, so it is important to look for symptoms on the trunk and branches. Symptoms that can be used as indicators for sampling include frass, discoloration and deformation of bark, oozing oviposition sites, larval galleries and exit holes (http://bfw.ac.at/400/pdf/ALB-Verwechslung-Folder.pdf).

The likelihood of detecting *A. glabripennis* in a tree is determined by the distribution of *A. glabripennis* through the tree. Some 30 eggs are laid per female, ranging primarily from 1.5 m up the trunk and above into the tree canopy branches. Frass and exit holes are a particularly good indicator of larval activity. Experience in Canada and Europe shows that the best way to perform inspections on large trees is to use tree climbers. These proved more effective than mechanized lifters or inspections from the ground with binoculars.

Identification of the pest

Adults of *A. glabripennis* are identified mainly morphologically. For pest larvae, a molecular identification test (PCR) is being developed.

Public awareness

Public awareness activities should especially target those importing and trading plants and plant products, agencies and stakeholders working with plantations of host plants (e.g. municipalities), parks, nurseries, shelterbelts, ash forests, etc. This is very important for early detection and reduced spread of *A. glabripennis*. Public awareness activities can be achieved, for example, via the Internet and workshops involving growers, gardeners, school children, tree-pruning company employees, entomologists, etc..

Communication

A system should be in place so that each finding or suspicion of *A. glabripennis* should be reported immediately to the NPPO.

Appendix 2 – Eradication of *A. glabripennis*

To eradicate *A. glabripennis*, the following elements should be implemented.

1) Surveillance of the full distribution of the pest

When the presence of eggs, larvae or adults of *A. glabripennis* is confirmed, then an intensive delimiting survey (according to ISPM 6 *Guidelines for surveillance*: FAO, 1997) to establish the full extent of the infestation should be carried out immediately. This should cover a 1–2-km radius from the first finding. The purpose is to determine the geographic limits of the infested area (or areas) and then to demarcate the regulated area. The radius may be reduced to 1 km if the survey indicates a small localized infestation. If further infested trees are detected, the boundaries of the delimiting survey should be moved outwards accordingly until no newly infested trees are recorded.

Samples should be taken from all host trees and other material showing symptoms and signs of activity that could be associated with the presence of *A. glabripennis*. The inspection should focus on surfaces of trunks. In principle, apparently healthy trees may contain *A. glabripennis*, and sampling from apparently healthy trees is therefore valuable. When felling trees, the trunk of each tree felled should be examined by cutting it into thin slices.

2) Measures to prevent spread of the pest

A regulated area should be established immediately upon the first detection of an outbreak. It should include:

- the infested area, a clear-cut area of 100 m radius around any infested host plant

- a buffer zone (monitoring area) not less than 2 km wide adjacent to the infested area which will be monitored intensively.

The measures to be applied to the movement of all types of host commodity, in order to prevent transfer of *A. glabripennis* from the regulated area, should be at least as stringent as those applied for import. This is done by preventing the insects from emerging from infested wood and thus eliminating the possibility of transfer to other trees where they could create new foci of infestation. These measures are applied in the regulated area to species known to be susceptible to *A. glabripennis*.

In the regulated area, plants for planting species known to be hosts of *A. glabripennis* should not be grown in a place of production unless that place of production is inspected and no *A. glabripennis* is found. Host plants for planting should be grown under insect-proof conditions, or in a site of production with preventive treatments (when available) and a buffer zone of 2 km.

3) Control measures to eradicate the pest when found

Plants for planting

Infested plants for planting should be destroyed immediately.

Standing trees (living or dead)

When felling trees, the trunk and branches of each tree felled should be examined by cutting into thin slices.

Larger infested area

On the basis of visual inspection, it is generally not possible to distinguish living trees expressing wilt symptoms caused by *A. glabripennis* from those trees that have wilt symptoms due to other causes. Early infestation is often symptomless. In an infested area, any dead or dying host trees are therefore to be considered as being potentially infested with *A. glabripennis* and should be felled and processed immediately. To minimize the likelihood of breeding of *A. glabripennis*, the trees should be cut at the soil surface. All felled trees should be assessed for the presence of *A. glabripennis*. If *A. glabripennis* is detected, all host trees within a radius of at least 100 m (the size chosen should be based on expert judgement) should be felled and destroyed (including all felling debris), as attacks by *A. glabripennis* tend to be grouped on neighbouring trees. At least a representative sample, ideally all, of the felled trees should be inspected thoroughly for the presence of *A. glabripennis*. If any infested trees are found, the felling area should be extended by at least a further 100 m.

Trees in urban areas (cities, parks, etc.)

Trees found to be infested should be felled immediately and destroyed/processed, and the stumps destroyed. Dissection of material can also provide much information regarding the larvae and the extent of the infestation.

Wood

Wood of host trees from infested and clear-cut areas may be dealt with in the following ways.

- It may be transported freely out of the area provided it is either heat-treated so that the wood-core temperature is maintained at 56°C for 30 min according to EPPO Standard PM 10/6(1), or fumigated with a suitable fumigant according to EPPO Standard PM 10/7(1), or irradiated according to EPPO Standard PM 10/8(1).
- If not treated using an approved procedure, the wood should be destroyed completely by burning. If burning is not possible, wood can also be deep-buried under the control and responsibility of the NPPO.
- It may be used for industrial or fuel purposes within the infested and clear-cut areas outside the flight period of the pest, in a way that does not allow adult emergence.
- It may be chipped and left on site provided chips do not exceed 2.5 cm in any dimension and can then be moved freely outside the pest flight period.
- Wood may be processed into sawn wood for use within the infested area, provided it is inspected by the NPPO and found free from *A. glabripennis*. If the wood is derived from trees felled during the *A. glabripennis* flight period (between 1 April and 31 October for Central and Mediterranean Europe), it has to be processed immediately into sawn wood. Wood from trees felled outside the *A. glabripennis* flight period (1 November–31 March for Central and Mediterranean Europe) can be moved under official control outside the area to an approved processing facility, and should be treated, processed or destroyed before the next flight period of the pest under the control and responsibility of the NPPO. Other wood remaining from felled trees should be treated, processed or destroyed under the control and responsibility of the NPPO.

Bark

Isolated bark removed from trees in the infested area could still attract, and therefore carry, *A. glabripennis* beetles, and should be either destroyed (e.g. by burning) or transported in closed containers and under official control to approved processing facilities at any time of the year. It can be freely transported from the infested area outside the pest flight period.

Waste wood and debris

Waste wood and debris produced during felling in the infested area and the clear-cut areas should be destroyed completely by burning at or near the place where the tree was felled, or chipped to a maximum size of 2.5 cm in any dimension, or buried under the control and responsibility of the NPPO. These actions should be carried out as soon as possible after felling, particularly during the summer period. Waste wood produced during other processing procedures should be destroyed by burn-

ing, used as industrial fuel, or fumigated with a suitable fumigant under the control and responsibility of the NPPO. Residual and waste wood can also be transported in closed containers and under official control to approved processing facilities outside the pest flight period, and utilized before the start of the next flight period.

General measures

General measures taken in the regulated area should aim to decrease the likelihood of build-up and dispersal of *A. glabripennis*, and hence reduce the likelihood of spread of the pest that could lead to new foci of *A. glabripennis* infestation. This requires the maintenance of a high degree of forest and amenity hygiene.

Appendix 3 – Host plants that have been found infested by *A. glabripennis*

	Occurrence in following countries											
Tree species	China	Korea*	Japan	USA	Canada	AT	DE	NL	UK	CH	IT	FR
†*Acer* spp.	X	X		X	X	X	X				X	X
A. buergerianum				X								
A. campestre						X	X		X	X		
A. mono		X										
A. negundo	X			X					X			X
A. palmatum							X					
A. platanoides				X		X	X			X		X
A. saccharinum				X		X	X					X
A. saccharum				X		X						
A. truncatum		X										
A. rubrum				X								
A. pseudoplatanus				X		X		X	X	X	X	
Aesculus spp.				X								
Aesculus hippocastanum						X	X		X			X
Aesculs x *carnea*						X						
Albizia spp.				X								
Alnus spp.	X											
Betula spp.	X			X	X	X	X				X	X
Betula pendula									X		X	
Buddleja sp.										QH		
Carpinus betulus												X
Celtis spp.				QH								
Cercidiphyllum spp.				X								
Elaeagnus sp.	X											
Fagus sylvatica						X	X					
Fagus sylvatica 'atropunicea'						X						
F. sylvatica 'asplenifolia'						X						
Fraxinus spp.	X			X		X						
Hibiscus spp.				QH								
Malus spp.	X											
Malus domestica cv. Golden Delicious						DC						
Malus pumila	X											
Melia spp.	X											
Morus spp.	X											
Morus alba	X											
Platanus spp.	X			X		X						
Populus spp.‡	X			X	X	X	X			X		X
P. nigra	X											
P. deltoides	X											
P. × *canadensis*	X					X						
P. dakhuanensis	X											
P. euramericana									X			
Prunus spp.	X					NS						X
P. salicina	X											

(continued)

Table *(continued)*

Tree species	Occurrence in following countries											
	China	Korea*	Japan	USA	Canada	AT	DE	NL	UK	CH	IT	FR
Pyrus spp.	X											
Quercus rubra				X								
Robinia spp.	X											
Robinia pseudoacacia	X											
Salix aurita								X				
Salix spp.	X			X	X	X	X			X	X	X
Salix caprea									X			
Salix cinerea									X			
Salix fragilis									X			
Sophora spp.	X											
Sorbus spp.				X								
Ulmus spp.	X			X	X						X	
Ulmus parviflora			X									

*Democratic People's Republic of Korea and Republic of Korea.

†Where only the genus is given (e.g. *Acer* spp.) the record did not state the species name.

‡According to Hu *et al.* (2009) *Populus* species do not have the same susceptibility, and range from very good host to rare host.

QH: questionable host (e.g. egg deposit but no development).

DC: complete development in cages.

NS: egg deposit observed as well as first larval activities, but did not survive; reason unclear, maybe low temperature.

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Addendum

European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes PM 9/15 (1)

National regulatory control systems
Systèmes de lutte nationaux réglementaires

PM 9/15 (1) *Anoplophora glabripennis*: procedures for official control

This Standard (OEPP/EPPO, 2013) was published in December 2013 in the National regulatory control systems section of the *EPPO Bulletin*.

Following a recently convened expert working group on EU emergency measures in regard to *Anoplophora glabripennis* it was concluded that it was appropriate to include the plant taxon *Tilia* spp. as a recognised host plant for *Anoplophora glabripennis* in the EPPO National regulatory control systems Standard.

The EPPO Secretariat agrees that *Tilia* spp. should now be added to the Table of Host plants in Appendix 3 (the additional line for the table is included below). The reference Smith *et al.* (2009) should also be added to the reference list of the Standard.

Appendix 3: Additional line to be added to the table of host plants that have been found infested by *A. glabripennis*

	Occurrence in following countries											
Tree species	China	Korea	Japan	USA	Canada	AT	DE	NL	UK	CH	IT	FR
Tilia spp.	DH				X	X						X

DH, dead-end host (eggs fail to hatch and larvae die before boring into the xylem). Smith *et al.* (2009) report that *Tilia* spp in China is a dead-end host. In Austria viable eggs and larval activity were noted, in France oviposition was noted. In both Austria and France eradication measures were immediately implemented.

References

OEPP/EPPO (2013) EPPO Standard PM 9/15 (1) Anoplophora glabrinpennis: procedures for official control. *Bulletin OEPP/EPPO Bulletin* **43**, 510–517.

Smith MT, Turgeon JJ, de Groot P & Gasman B (2009) Asian Longhorned Beetle Anoplophora glabripennis (Motschulsky): Lessons Learned and Opportunities to Improve the Process of Eradication and Management *American Entomologist* **55**(1), 21–25.

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Erratum

National regulatory control systems
Systèmes de lutte nationaux réglementaires PM 9/15 (1)

PM 9/15 (1) *Anoplophora glabripennis*: procedures for official control

This Standard (OEPP/EPPO, 2013) was published in December 2013 in the National regulatory control systems section of the *EPPO Bulletin*.

It has recently been brought to our attention that *Rosa* spp., were erroneously included in the introduction to this Standard as host plants. *Rosa* spp. are not listed in the full host list in the Appendix and it appears that this plant species has never been found to be infested with *Anoplophora glabripennis* in Europe.

The EPPO Secretariat agrees that *Rosa* spp. should be deleted from the list of host plants in the introduction.

In addition it has been pointed out that there was an error in the personal communication reported in the line at the end of page 510:

'In respect to overwintering, the larvae of the closely related *A. chinensis* have been shown to survive temperatures of 0°C for prolonged periods, and outbreaks of the pest have been seen in areas where the minimum winter temperatures are well below zero. In Braunau (Austria), *A. chinensis* larvae survived winter temperatures lower than –15°C (H. Krehan, pers. comm., 2011).

The two sentences above should be replaced by the following corrected line:

'In respect to overwintering, in Braunau (Austria), *A. glabripennis* larvae survived winter temperatures lower than −15°C (H. Krehan, pers. comm., 2011).'

The EPPO Secretariat apologizes for these errors.

Reference

OEPP/EPPO (2013) *EPPO Standard* PM 9/15 (1) *Anoplophora glabrinpennis:* procedures for official control. *Bulletin OEPP/EPPO Bulletin* **43**, 510–517.

