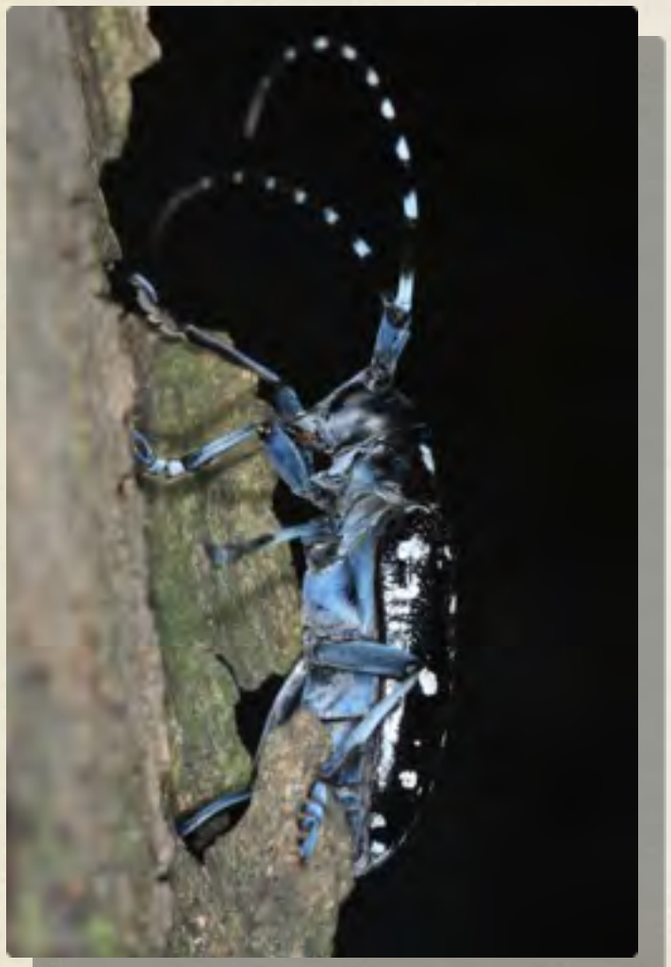
Expert Mission on efficient phytosanitary measures aiming at eradicating *Anoplophora* spp.



Legal base, details of morphology, bio-ethology, sign and symptoms of the infestation, contingency plan

Short Term Experts

Matteo Maspero & Alessandro Bianchi

"BA 12 IB AG 01 - Further strengthening of capacitiesof phytosanitary sector in the fields of plant protection products, plant health and seeds and seedlings, including phytosanitary laboratories and phytosanitary inspections"

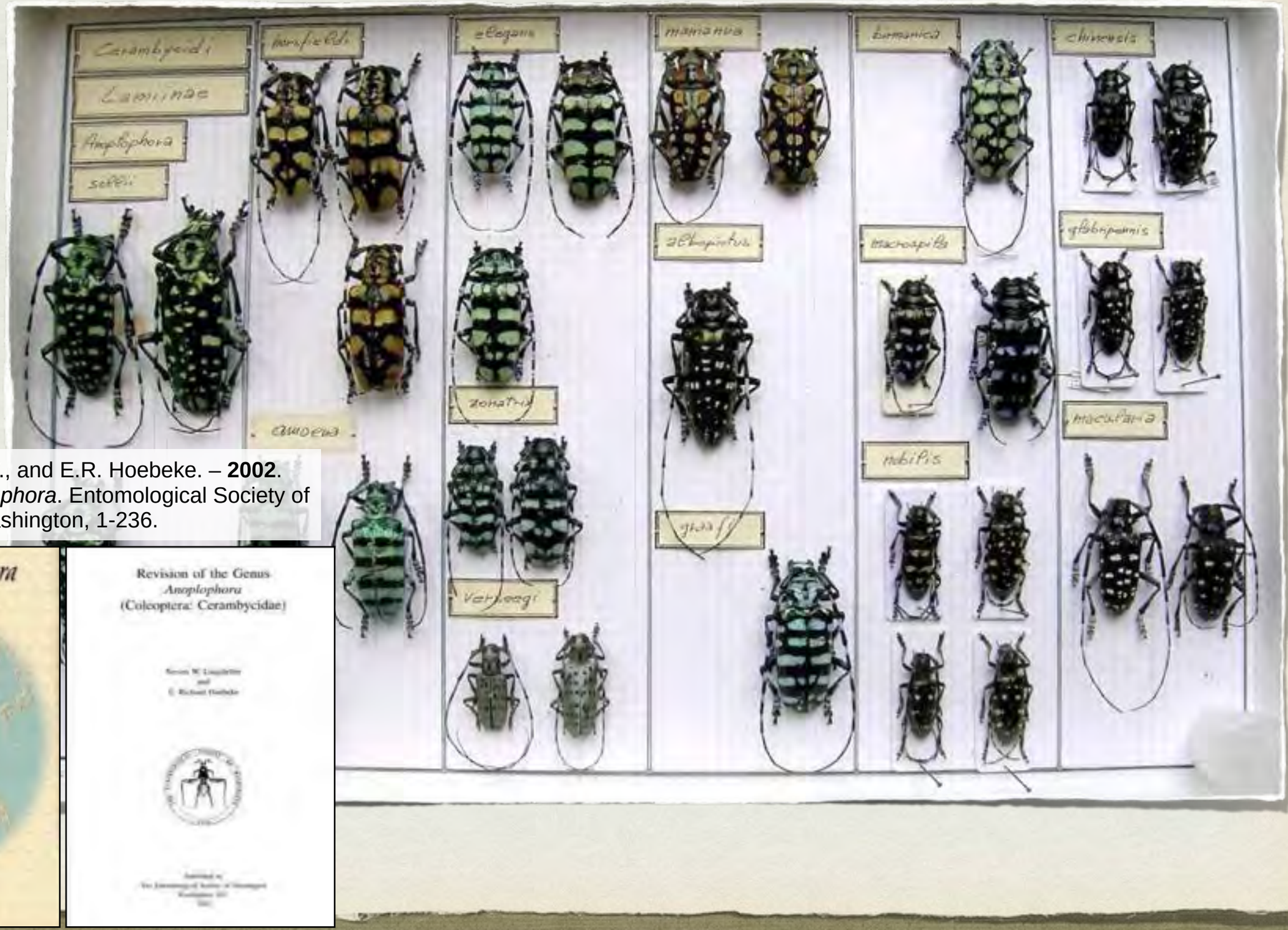
INTRODUCTION

The transport of **alien arthropods** associated with rapidly expanding global trade has led to an ever increasing list of quarantine pests establishing beyond their native range.

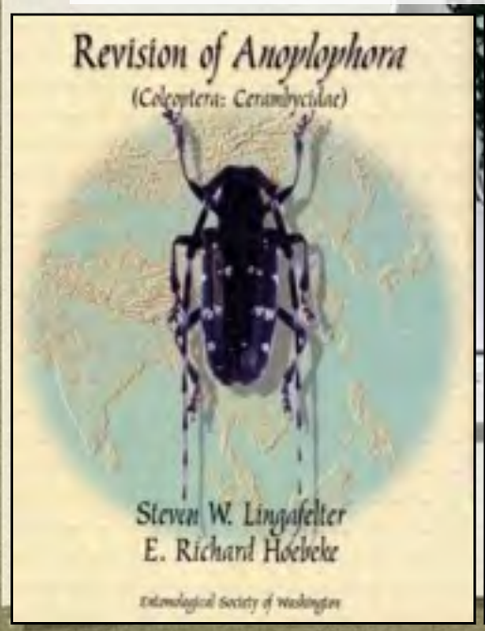
In recent years, ***Anoplophora chinensis,*** the Citrus longhorned beetle (**CLB**) and ***Anoplophora glabripennis,*** the Asian longhorned beetle (**ALB**), were unintentionally introduced in Europe.

TAXONOMY OF *ANOPLOPHORA* SPP.

CLB and **ALB** are members of the recently revised genus *Anoplophora* Hope (Coleoptera, Cerambycidae, Lamiinae, Lamiini) that now consists of 36 species of wood boring beetles that occur throughout Asia.



Lingafelter, S.W., and E.R. Hoebeke. – **2002**. Revision of *Anoplophora*. Entomological Society of Washington, 1-236.



The biology, habits, and host plants are known only for one- third. The majority of the published scientific works concern the economically important species:

Anoplophora chinensis
(forma *malasiaca*)

Anoplophora chinensis

Anoplophora glabripennis

Anoplophora glabripennis
(forma *nobilis*)

Anoplophora macularia

Pseudonemophas versteegii

- Beetles of CLB and ALB are quite similar and both have white patches, irregular-shaped, on the elytra.
- Body size ranges between 11 and 40 mm.
- The major distinction between the two species is the presence of numerous granulae at basal one-fourth of elytra in CLB while they are absent in ALB.

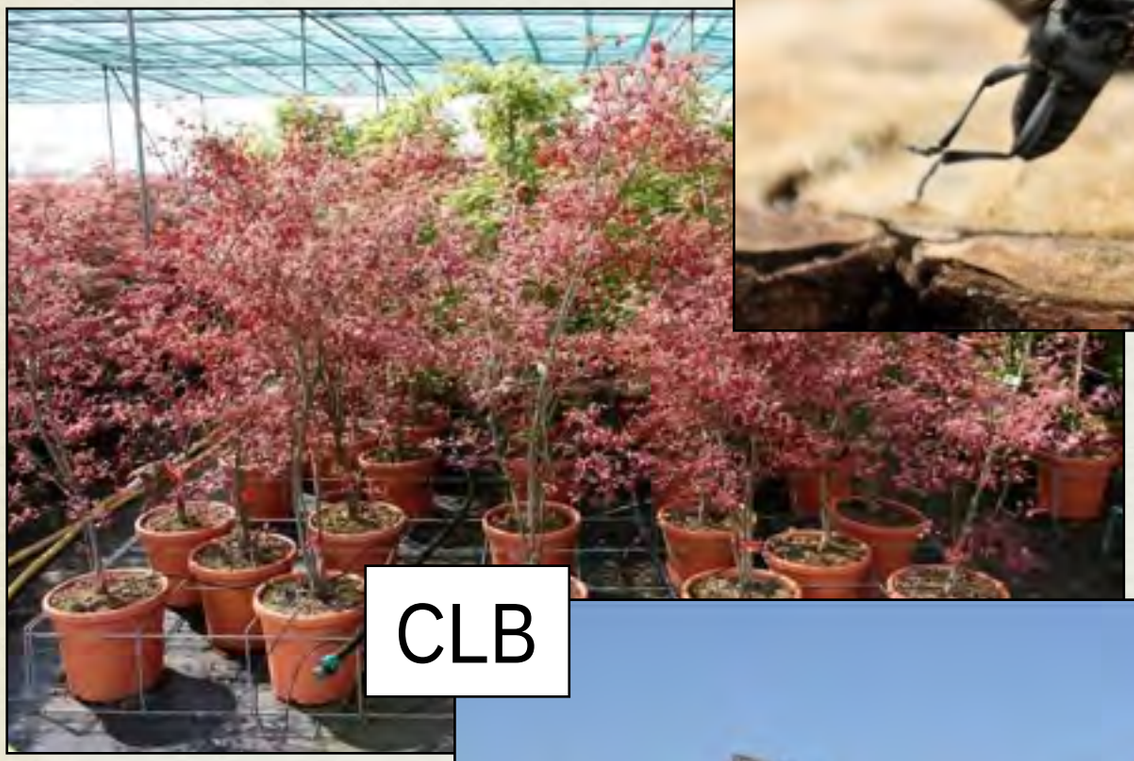
CLB is native to China, Korea and Japan (where it is present under the *malasiaca* form) with occasional records from Indonesia, Malaysia, Philippines, Taiwan and Vietnam.

ALB's native range includes China and Korea.

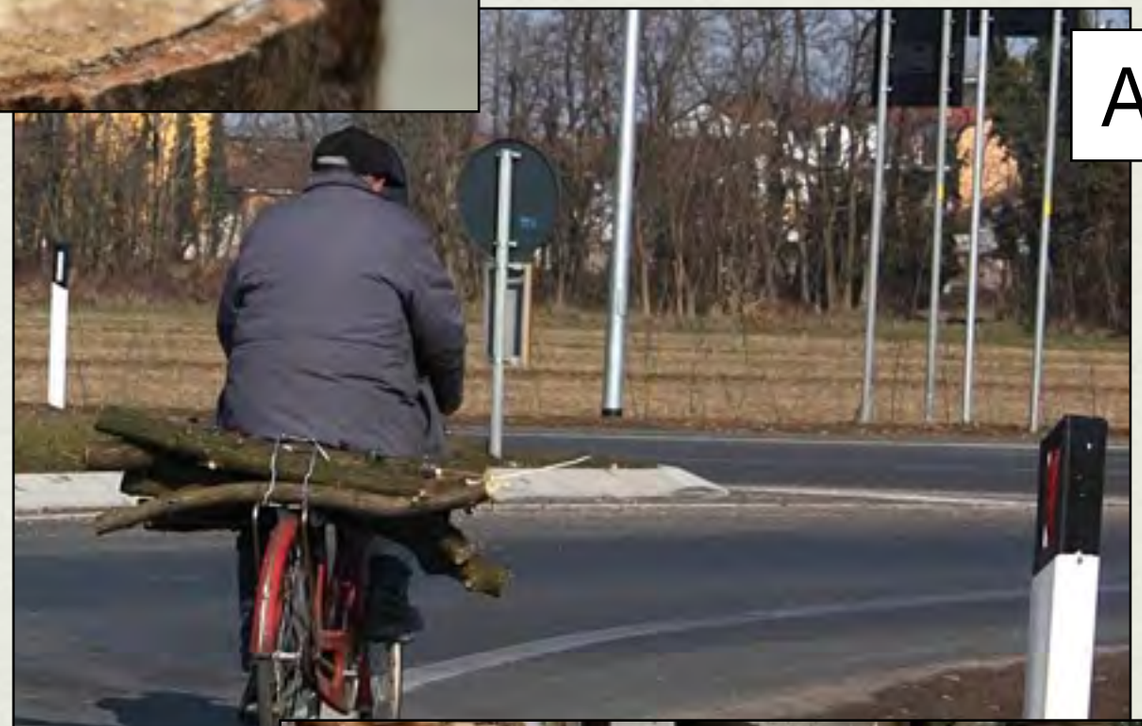
CLB is introduced within living trees (bonsais and maple rootstock)
ALB is introduced in wood packaging material

Movement pathway

Both species spread through active fly



CLB



ALB

Eggs in both species are oblong, white, 5-7 mm long

CLB oviposition signs are slits in the bark where female injects a single egg. When the ovipositor is inserted through the bark tissues, the upper layer of bark often splits resulting in a T-shaped oviposition scar.

ALB oviposition pits are funnel shaped, chewed through the bark . The beetle injects a single egg beneath bark.

Larvae are legless, cream-colored, 30-50 mm long when full grown. In both species, pronotum is pigmented with characteristic shield that differs in shape and size.

Pupa, whitish,
27-38 mm long

CLB lays eggs along the lower trunk, root collar region and on exposed roots.

ALB lays eggs on the upper part of the trunk and main branches.

- In both species the egg laying period takes place in summer. Incubation lasts 10-15 days. Larvae initially bore a feeding gallery in the cambium region then an oval-shaped tunnel in the sapwood and heartwood.

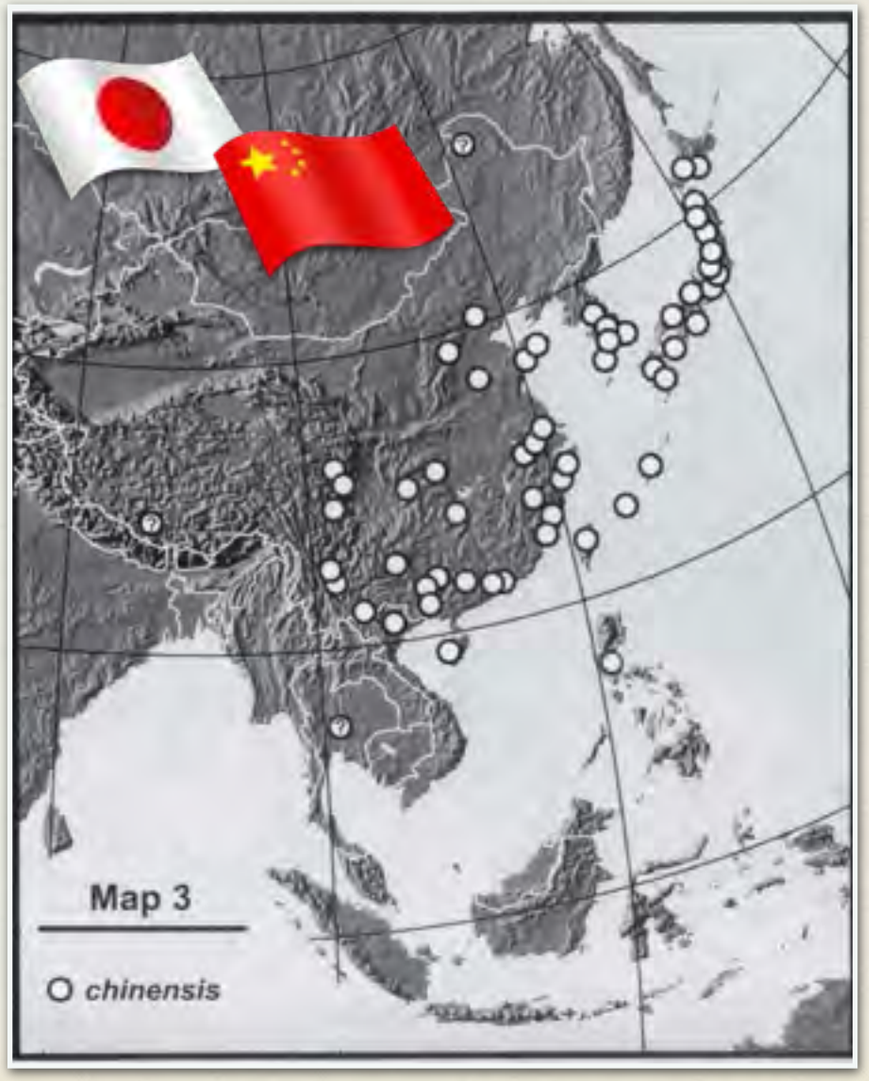
Pupation usually occurs in late spring – early summer into the pupal chamber.

BIOLOGY AND ETHOLOGY

Anoplophora chinensis (Forster) (Coleoptera: Cerambycidae) is an invasive woodborer which main pathway of entry was related to living trees such as bonsais imported from the Far East. The first breeding population outside its native range has been discovered in 2000, in Europe, in Lombardy, northern Italy.

A. chinensis, known with the common name of Citrus Longhorned Beetle (CLB), is a serious pest of fruit and ornamental in east and southeast Asia, especially in China.

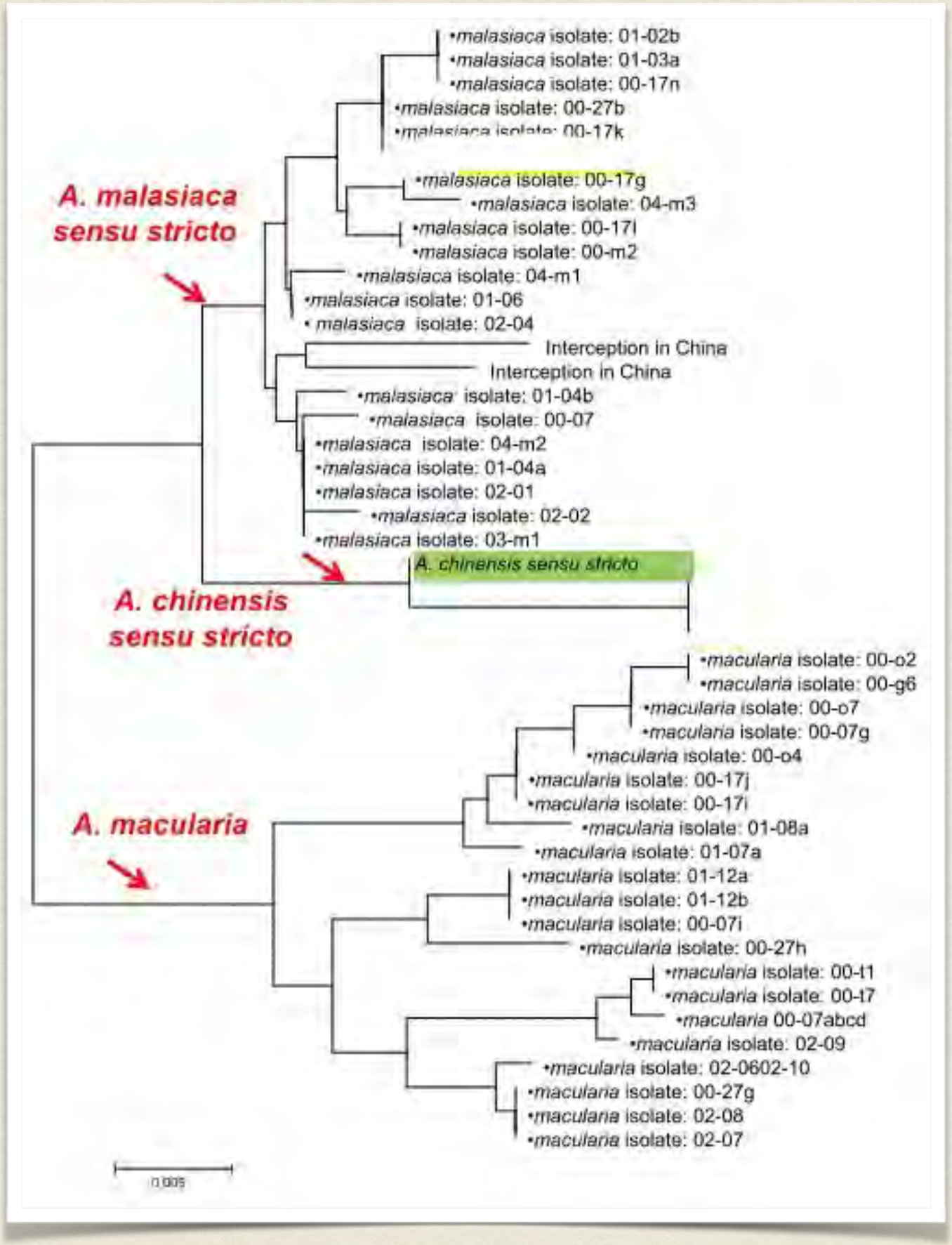
A. chinensis (form *malasiaca*) is widely distributed in Japan and Korea where it is considered a serious threat on citrus, apple, pear, maple, willow and many other tree species. In Japan are also reported damages on *Platanus orientalis*.



Before the revision of the genus *Anoplophora* (Lingafelter S.W., Hoebeke E. R., 2002) the form was considered as a separate specie: *Anoplophora malasiaca* Thomson.

Phylogenetic tree based on barcoding sequences of 426bp in length

Marie-Claude Bon, phD
EBCL–USDA-ARS



Egg

The egg looks like a rise seed, oblong, 5-7 mm long. The colour is initially white when is layed and it turns to ivory after maturation. Initially it has a jelly-like consistency since it have to be injected under the bark through the ovipositor inside a scar; then, the corion dry up and harden.

Each egg is layed singly but it is also possible to see many eggs layed very close each others. The hatching period takes 10 to 15 days at summer temperatures.

Larva

Typical of the family Carambycidae. Elongated, cylindrical, fleshy, shiny and cream-coloured; the head is prognathous and usually retracted into the prothorax that is larger than the meso- and methatorax and abdomen. The first segment of the torax (pronotum) is the largest and has a brown sclerotized plate on the dorsal side of it; the abdoment has 10 segments with spiracles visible on the mesothorax and on the abdominal segment VIII. The head has dark brown mouth parts mainly represented by two black mandibles.

The first three instars larva feed in the rotting cambial region for about 20 days and the early fourth instar move to the sapwood and heartwood going on by digging galleries that increase in diameter with the increasing size of the larva. The young larva is 7 - 20 mm in length while mature larva is 30-60 mm in length.

These larvae are capable of developing form egg to beetle stage inside a small portion of wood (e.g. a bonsai).

In fact, in small portions of wood like pieces of roots or young trees with a small diameter of the collar zone, a good number of larvae was able to reach the imago stage without entering in competition each others.

Pupa

The pupa is ivory-white with pale yellow thickening of the chitin. It is typically exarate showing all the future appendix of the beetle's imago. Touching it, the abdomen move in the caudal segment of it with a rhythmic swinging.

Adult

Adults are moderate size longhorned beetles, glossy black with 10-20 irregular-shaped white patches on the elytra.

Antennae are composed of 11 – segments (antennomera) and each segment has a white or pale blue basal portion and a black distal one. Characteristic and distinctive of the specie is the presence of 20-40 tubercles on the basal quarter of each elytron.

Life cycle

A. chinensis (form *malasiaca*) develop from egg to adult in 1 or 2 years, depending on the climatic conditions of the area. In North of Italy, most of the beetles develop in two years.

The egg laying is occurring from mid May/beginning of June till to the end of August but this period might vary in relation to the climate conditions. The incubation period takes 10 to 15 days at summer temperature (20-25 °C).

When the egg is layed on the collar zone, larvae already entered into the heartwood basically goes to the root system direction while maturation feeding is ongoing. Once the full grown instars is ongoing, they return to the collar zone before pupation, to create a pupal chamber. Sometimes, the way back to the collar zone is done by enlarging the same maturation gallery, some other they excavate a new one.

The pupal chamber is usually recognizable for the diameter (enlarged respect to the size of the tunnel) and for the presence of wood debris that result form a mechanical chewing of the larva with the mandibles. It is wood not digested, removed by the walls of the tunnel and located up and down the pupal chamber.

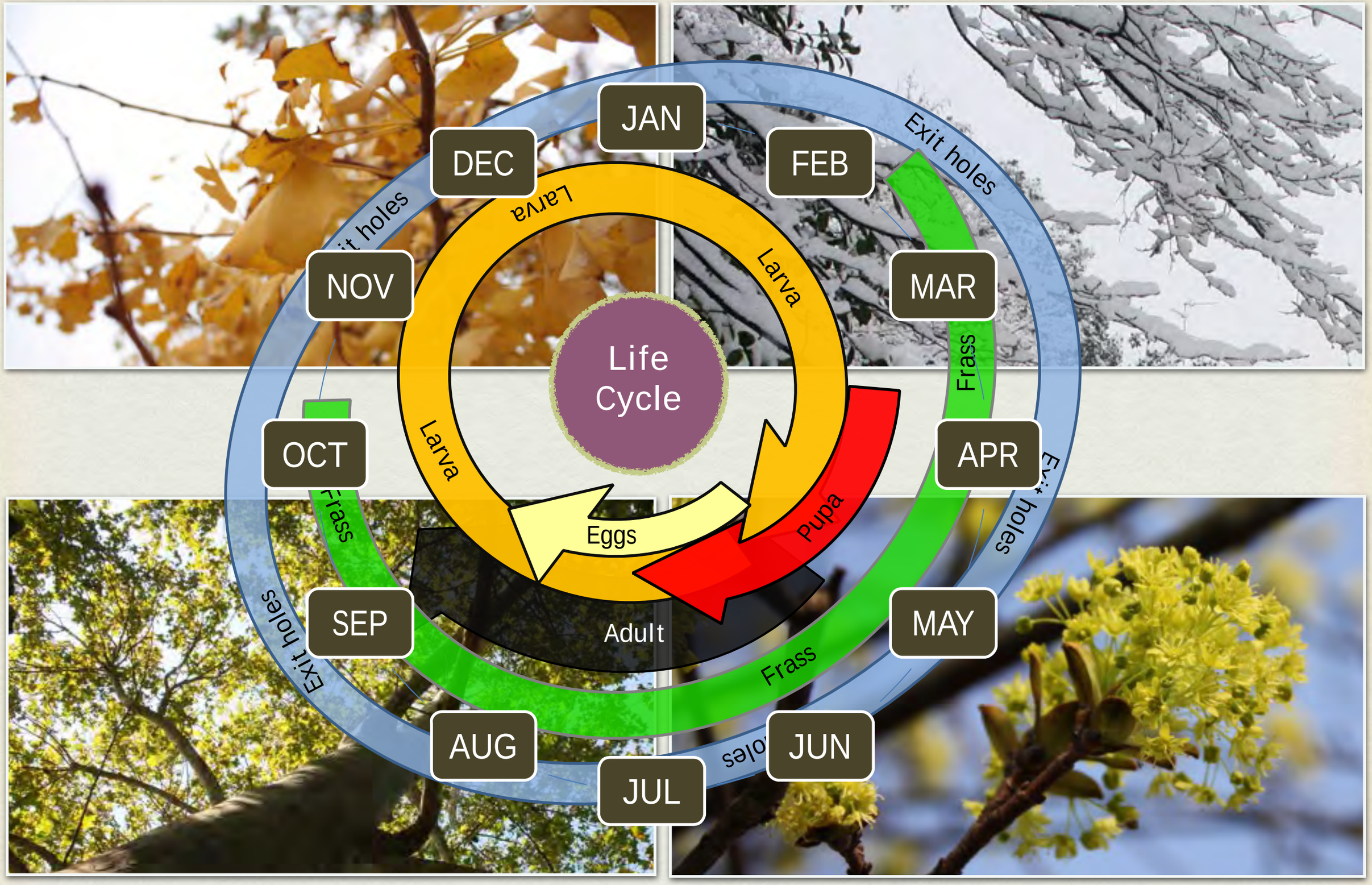
Frass is accumulated within the tunnel. Along it, larvae can open aerial holes that has the function of improving the movement of air inside the gallery and the extrusion of a certain amount of frass from the gallery. These pile of frass are visible on the ground level but they might also be accumulated below the soil, when the larva is feeding in the deep roots of the infested tree.

Most of the adults emerge from late May to late July. Once emerged from the tree, beetles goes directly to the crown of the plant where they start in feeding on bark twigs and leave's petiole. Maturation feeding lasts 2 weeks and once occurred they start in mating. Then females start in laying eggs at the base of the tree or on the superficial roots.

Tree species at risk

Although *Anoplophora chinensis* is known as the Citrus Longhorned Beetle because of in the Far East it is considered as a key pest in Citrus orchard, in Europe it attacks almost all broadleaf.

It is not easy to identify all the hosts tree of *Anoplophora* since it is a very poliphagous species which has a certain capability in adapting to the trees species available in a certain environment.
As far as we know, it does not attack conifers.



The life cycle of both species under natural conditions takes 1 – 2 years to complete.

Summary of the lifecycle

SIGNS AND SYMPTOMS OF INJURY

It is important to be familiar with the most evident indicators of the attack.

Sign of infestation means a physical damage to a tree caused by the insect. For example an oviposition slit, an exit hole, a feeding activity on a twig.

Symptom correspond to the tree's response to the insect attack. For example bark cracks, dead twigs, dead branches or, tree death.

As much the infestation is high as much easier is to found signs and symptoms of the beetle injury.
Only by looking at the all possible signs and symptoms of the infestation allow to increase the success of detecting a certain infested tree. This is particularly true when the level of infestation is low.

Acer saccharinum

Sign

CLB's sign can be classified in two groups: external and internal when respectively can be seen outside the bark and under the bark, by peeling it.

The most important external signs are:

1. oviposition slits;
2. pile of frass or debris;
3. adult feeding;
4. exit holes.

The most important internal signs are:

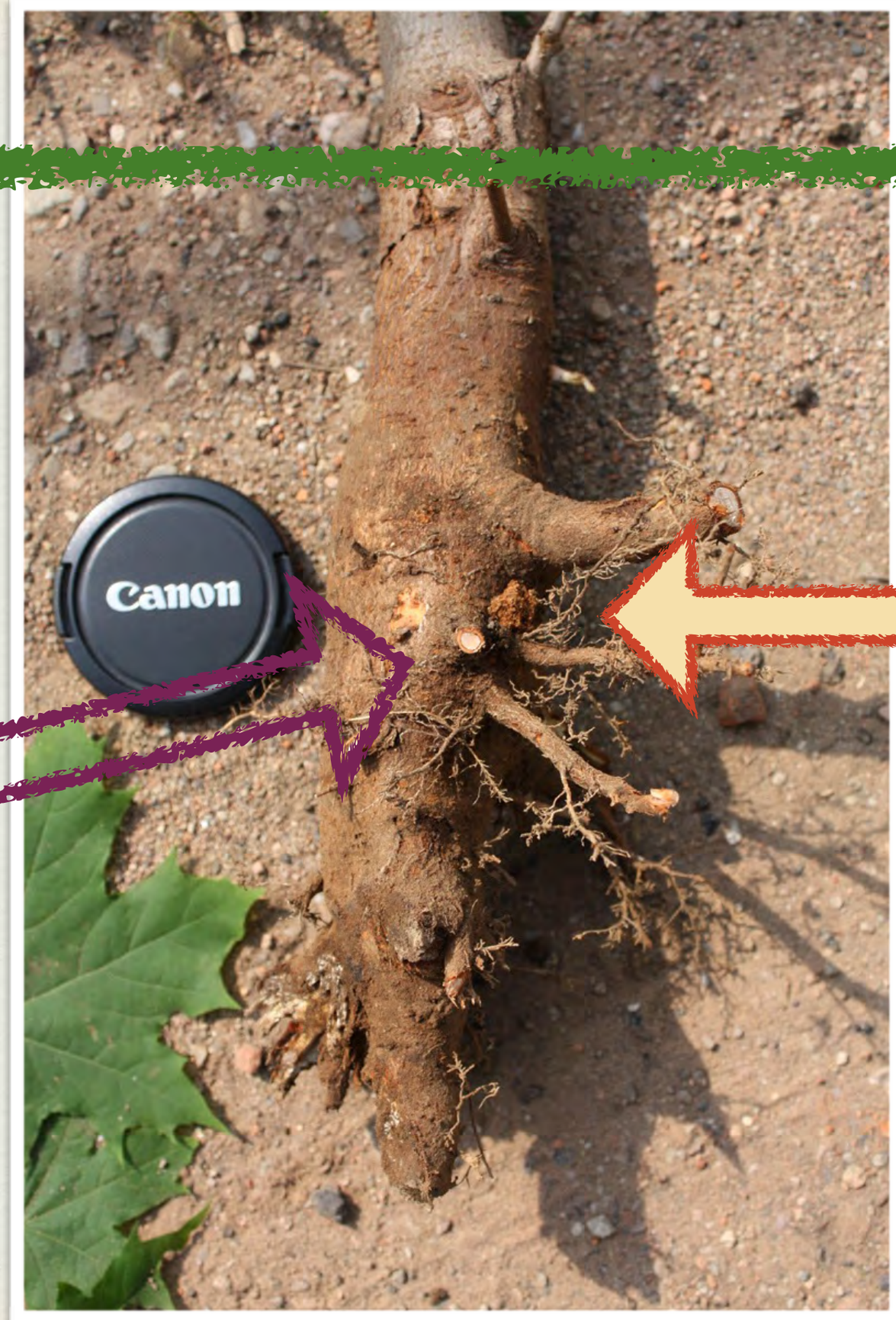
1. feeding galleries on the outer sapwood;
2. tunneling into the heartwood.

Typically, recently chewed oviposition pits are reddish in colour.

Acer pseudoplatanus

Oviposition pits created in previous years are dark brown to black.

Cracks on the bark below the ground level.



Carpinus betulus

Acer saccharinum

Acer saccharinum

Acer saccharinum

Acer saccharinum

Acer campestre

Acer campestre

Acer saccharinum

Platanus spp.

Most exit holes are visible for several years, however in some instance, callus tissue is produced around the hole.

Acer saccharinum

The growth of callus tissue can star soon after the adult emergence, especially if it occurs in early summer and can eventually enclose the exit hole completely.

Platanus spp.

Acer saccharinum

Dead tree

ERADICATION MEASURES

San Vittore Olona (Milano)

... winter 2006...

EMERGENCY MEASURES

- Emergency Measures are currently in place on certain “Harmful Organisms” (HO)
- these HO were previously unknown to occur in the EU and were not listed specifically in Directive 2000/29/EC
- as a result of identification of such pests, emergency measures are specified

Examples of other HO:

- *Anoplophora chinensis*
- *Pomaceae/Apple snail*
- *Xylella fastidiosa*
- *Phytophthora ramorum*
- Psa (kiwi cancker)
- *Epitrix*
- *Rhynchophorus ferrugineus*
- *Erwinia amylovora*

Emergency Measures based on:

- WTO SPS Measures
- FAO – IPPC ISPMs
- EPPO standards

LEGAL FRAMEWORK

COMMISSION IMPLEMENTING DECISION

of 1 March 2012

as regards emergency measures to prevent the introduction into and the spread within the Union of *Anoplophora chinensis* (Forster)

(notified under document (2012) 1310)

(2012/138/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community ....., thereof,

Whereas:

(1) The experience gained from the implementation of Commission Decision 2008/840/EC of 7 November 2008 on emergency measures to prevent the introduction into and the spread within the Community of *Anoplophora chinensis* (Forster) .....

(2)...

(3)...

.....

(8) To eradicate the specified organism and prevent its spread, Member States should establish demarcated areas and take the necessary measures. As part of their measures, Member States should carry out .....

.....

(11) Decision 2008/840/EC should therefore be repealed.

(12) The measures provided for in this Decision are in accordance with the opinion of the Standing Committee on Plant Health,

HAS ADOPTED THIS DECISION:

Article 1

Definitions

For the purposes of this Decision, the following definitions shall apply:

(a) 'specified plants' means plants for planting that have a stem or root collar diameter of 1 cm or more at their thickest point, other than seeds, of *Acer* spp., *Aesculus hippocastanum, Alnus* spp., *Betula* spp., *Carpinus* spp., *Citrus* spp., *Cornus* spp., *Corylus* spp., *Cotoneaster* spp., *Crataegus* spp., *Fagus* spp., *Lagerstroemia* spp., *Malus* spp., *Platanus* spp., *Populus* spp., *Prunus laurocerasus*, *Pyrus* spp., *Rosa* spp., *Salix* spp. and *Ulmus* spp.;

(b) 'place of production' means the place of production as defined in the FAO International Standard for Phytosanitary Measures ('ISPM') No 5;

(c) 'specified organism' means *Anoplophora chinensis* (Forster).

Article 2

Import of the specified plants originating in third countries except China

As regards imports originating in third countries where the specified organism is known to be present, other than China, specified plants may only be introduced into the Union if they fulfil the following conditions:

(a) they comply with the specific import requirements, as set out in point 1 of Section 1(A) of Annex I;

(b) on entry into the Union they are inspected by the responsible official body in accordance with point 2 of Section 1(A) of Annex I for the presence of the specified organism, and no signs of that organism have been found.

Article 3

Import of the specified plants originating in China

1. As regards imports originating in China, specified plants may only be introduced into the Union if they fulfil the following conditions:

(a) they comply with the specific import requirements as set out in point 1 of Section 1(B) of Annex I;

(b) ...

(c) ....

....

2. However, plants of *Acer* spp. shall not be introduced into the Union until 30 April 2012.

From 1 May 2012, paragraph 1 shall apply to plants of *Acer* spp.

3. The Commission shall communicate to the Member States the register of places of production in China which its national plant protection organization has established as in compliance with point 1(b) of Section 1(B) of Annex I

Where that organisation updates the register by removing a place of production....

Where that organisation updates the register by including a place of production because that organisation.....

4. Where during an inspection at a registered place of production, as set out in points (ii), (iii) and (iv) of point 1(b) of Section 1(B) of Annex I, the Chinese plant protection organisation finds evidence of the presence of the specified organism...

5. Where the Commission has evidence from sources other than those referred to in paragraphs 3 and 4 that a place of production listed in the register does not comply...

Article 4

Movement of specified plants within the Union

Specified plants originating in demarcated areas within the Union established in accordance with Article 6 may be moved within the Union only if they meet the conditions set out in point 1 of Section 2 of Annex I.

.....

.....

Article 5

Surveys and notifications of the specified organism

1. Member States shall conduct official annual surveys for the presence of the specified organism and for evidence of infestation by that organism on host plants in their territory.

....

2. Without prejudice to Article 16(1) of Directive 2000/29/EC, Member States shall, within 5 days and in writing, notify the Commission and the other Member States of the presence of the specified organism in an area within their territory where that presence was previously unknown or the specified organism was considered to have been eradicated or where the infestation was detected on a plant species previously not known to be a host plant.

Article 6

Demarcated areas

1. Where the results of the surveys referred to in Article 5 (1) confirm the presence of the specified organism in an area, or there is evidence of the presence of that organism by other means, the MS concerned shall without delay establish a demarcated area, which shall consist of an infested zone and a buffer zone, in accordance with Section 1 of Annex II.

2. MS need not establish demarcated areas ,as provided for in paragraph 1, if the conditions, as set out in point 1 of Section 2 of Annex II are satisfied. In such a case, MS shall take the measures as set out in point 2 of that Section.

3. MS shall take measures in the demarcated areas, as set out in Section 3 of Annex II.

4. MS shall set time periods for the implementation of the measures provided for in paragraphs 2 and 3.

Article 7

Reporting on measures

1. Member States shall, within 30 days of the notification referred to in Article 5(2), report to the Commission and the other Member States on the measures they have taken or intend to take in accordance with Article 6.

The report shall also include the description of a demarcated area, where established, and information on its location with a map showing its delimitation and information on the current pest status as well as measures to comply with....

...

2. Member States shall by 30 April of each year communicate to the Commission and the other Member States a report including an up-to-date list of all demarcated areas established under Article 6, including information.....

Article 8

Compliance

Member States shall take all measures to comply with this Decision and, if necessary, amend the measures which they have adopted to protect themselves against the introduction and spread of the specified organism in such a manner that those measures comply with this Decision. They shall immediately inform the Commission of those measures.

Article 9

Repeal

Decision 2008/840/EC is repealed.

Article 10

Review

This Decision shall be reviewed by 31 May 2013 at the latest.

Article 11

Addressees

This Decision is addressed to the Member States.

Done at Brussels, 1 March 2012.

For the Commission

John DALLI

Member of the Commission

ANNEX I

1. Specific import requirements

A. *Imports originating in third countries except China*

1. Without prejudice to the provisions listed in Annex III, Part A(9, 16, 18) and Annex IV, Part A(I)(14, 15, 17, 18, 19.2, 20, 22.1, 22.2, 23.1, 23.2, 32.1, 32.3, 3 .....

.....which states under the rubric 'Additional Declaration':

(a) that the plants have been grown throughout their life in a place of production which is registered and supervised by the national plant protection organisation in the country of origin and situated in a pest-free area established by that organisation in accordance with relevant International Standards for Phytosanitary Measures. The name of the pest-free area shall be mentioned under the rubric 'place of origin'; or

(b) that the plants have been grown, during a period of at least 2 years prior to export, in a place of production established as free from *Anoplophora chinensis* (Forster) in accordance with International Standards for Phytosanitary Measures:

(i) which is registered and supervised by the national plant protection organisation in the country of origin; and

(ii) which has been subjected annually to at least two official meticulous.....

.....

.....

.....

B. *Imports originating in China*

1. Without prejudice to the provisions listed in Annex III, Part A(9, 16, 18) and Annex IV, Part A(I)(14, 15, 17, 18, 19.2, 20, 22.1, 22.2, 23.1, 23.2, 3.....

.....of that Directive which states under the rubric 'Additional Declaration':

(a) that the plants have been grown throughout their life in a place of production which is registered and supervised by the national plant protection organisation of China and situated in a pest-free area established by that organisation in accordance with relevant International Standards.....

(b) that the plants have been grown, during a period of at least 2 years prior to export, in a place of production established as free from *Anoplophora chinensis* (Forster) in accordance with International Standards for Phytosanitary Measures:

(i) which is registered and supervised by the national plant protection organisation of China; and

(ii) which has been subjected annually to at least two official inspections for any sign of *Anoplophora chinensis* (Forster) carried out at appropriate times....

.....

.....

2. Specified plants imported in accordance with point 1 shall be meticulously inspected at the point of entry or the place of destination established in accordance with Directive 2004/103/EC. Inspection methods applied, including targeted destructive sampling on each lot, shall ensure the detection of any sign of the specified organism, in particular in roots and stems of the plants. The size of the sample for inspection shall be such as to enable at least the detection of 1 % level of infestation with a level of confidence of 99 %.

   The destructive sampling referred to in the first paragraph shall be carried out at the level set out in the following table:

Number of plants in the lot	Level of destructive sampling (number of plants to be cut) 10 % of lot size
1 – 4 500	10 % of lot size
> 4 500	450

2. Conditions for movement

1. Specified plants originating (1) in demarcated areas within the Union may be moved within the Union only if they are accompanied by a plant passport prepared and issued in accordance with Commission Directive 92/105/EEC (2) and have been grown during a period of at least 2 years prior to movement in a place of production:

(i) which is registered according to Commission Directive 92/90/EEC (3); and

(ii) which has been subjected annually to at least two official meticulous inspections for any sign of the specified organism carried out at appropriate times and no signs of the specified organism have been found; where appropriate, this inspection shall include targeted destructive sampling.....

.....

(iii) which is located in a demarcated area where the plants have been grown in a site:

— with complete physical protection against the introduction of the specified organism, or

— with the application of appropriate preventive treatments or where targeted destructive sampling is carried out on each lot.....

.....

.....

ANNEX II

ESTABLISHMENT OF DEMARCATED AREAS AND MEASURES, AS PROVIDED FOR IN ARTICLE 6

1. Establishment of demarcated areas

1. Demarcated areas shall consist of the following zones:

   (a) an infested zone which is the zone where the presence of the specified organism has been confirmed, and which includes all plants showing symptoms caused by the specified organism and, where appropriate, all plants belonging to the same lot at the time of planting; and

   (b) a buffer zone with a radius of at least 2 km beyond the boundary of the infested zone.

2. The exact delimitation of the zones shall be based on sound scientific principles, the biology of the specified organism, the level of infestation, the particular distribution of the host plants in the area concerned and evidence of establishment of the specified organism. In cases where the responsible official body concludes that eradication of the specified organism is possible, taking into account the circumstances of the outbreak, the results of a specific investigation or the immediate application of eradication measures, the radius of the buffer zone may be reduced to not less than 1 km beyond the boundary of the infested zone. In cases where eradication of the specified organism is no longer possible the radius cannot be reduced below 2 km.

3. If the presence of the specified organism is confirmed outside the infested zone, the delimitation of the infested zone and buffer zone shall be reviewed and changed accordingly.
4. Where in a demarcated area, based on the surveys referred to in Article 5(1) and on the monitoring referred to in point 1(h) of Section 3 of Annex II, the specified organism is not detected for a period that includes at least one life cycle and 1 additional year but in any case is not less than 4 consecutive years, this demarcation may be lifted. The exact length of a life cycle depends on evidence that is available for the area concerned or similar climate zone. The demarcation may also be lifted in cases where, following further investigation, the conditions set out in point 1 of Section 2 are found to be satisfied.

2. Conditions under which no demarcated area need be established

1. In accordance with Article 6(2) Member States need not establish a demarcated area, as provided for in Article 6(1), where the following conditions are satisfied:

   (a) there is evidence either that the specified organism has been introduced into the area with the plants on which it was found and there is.....

   .....

   ...

3. Measures to be taken in demarcated areas

1. In demarcated areas Member States shall take the following measures to eradicate the specified organism:

(a) the immediate felling of infested plants and plants with symptoms caused by the specified organism, and the complete removal of their roots; in cases where the infested plants were found outside the flying period of the specified organism the felling and removal shall be carried out before the start of the next flying period; in exceptional cases where a responsible official body concludes that such felling is inappropriate an alternative eradication measure may be applied offering the same level of protection against the spread of the specified organism; the reasons for that conclusion and the description of the measure shall be notified to the Commission in the report referred to Article 7;

(b) the felling of all specified plants within a radius of 100 m around infested plants and the examination of those specified plants for any sign of infestation; in exceptional cases where a responsible official body concludes that such felling is inappropriate, the individual detailed examination for any sign of infestation of all these specified plants within that radius which are not to be felled, and the application, where appropriate, of measures to prevent any possible spread of the specified organism from those plants;

(c) removal, examination and disposal of plants felled in accordance with points (a) and (b) and of their roots; taking of all necessary precautions to avoid spreading of the specified organism during and after felling;

(d) prevention of any movement of potentially infested material out of the demarcated area;

(e) tracing back to the origin of the infestation and tracing of plants associated with the case of infestation concerned, as far as possible, and the examination thereof for any sign of infestation; the examination shall include targeted destructive sampling;

(f) where appropriate, replacement of specified plants by other plants;

(g) prohibition of planting of new specified plants in the open air in an area referred to in point 1(b) of Section 3 of Annex II, except for places of production referred to in Section 2 of Annex I;

(h) intensive monitoring for the presence of the specified organism by annual inspections at appropriate times on host plants, with specific focus on the buffer zone, including where appropriate targeted destructive sampling; the number of samples shall be indicated in the report referred to in Article 7;

(i) activities to raise public awareness concerning the threat of that organism and the measures adopted to prevent its introduction into and spread within the Union including the conditions regarding movement of specified plants from the demarcated area established under Article 6;

(j) where necessary, specific measures to address any particularity or complication that could reasonably be expected to prevent, hinder or delay eradication, in particular those related to the accessibility and adequate eradication of all plants that are infested or suspected of infestation, irrespective of their location, public or private ownership or the person or entity responsible for them;

(k) any other measure, which may contribute to the eradication of the specified organism, taking account of ISPM No 9 (1) and applying an integrated approach according to the principles set out in ISPM No 14 (2).

The measures referred to in points (a) to (k) shall be presented in the form of a report referred to in Article 7.

2. When the results of the surveys referred to in Article 5 during more than 4 consecutive years have confirmed the presence of the specified organism in an area and in case there is evidence that the specified organism can no longer be eradicated, Member States can limit the measures to the containment of the specified organism within that area. Such measures shall include at least the following:

(a) felling of infested plants and plants with symptoms caused by the specified organism, and the complete removal of their roots; felling activities shall start immediately, however in cases where the infested plants were found outside the flying period of the specified organism the felling and removal shall be carried out before the start of the next flying period; in exceptional cases where a responsible official body concludes that such felling is inappropriate analternative eradication measure may be applied offering the same level of protection against the spread of the specified organism; the reasons for that conclusion and the description of the measure shall be notified to the Commission in the report referred to in Article 7;

(b) removal, examination and disposal of plants felled and of their roots; taking of necessary precautions to avoid spreading of the specified organism after felling;

(c) prevention of any movement of potentially infested material out of the demarcated area;

(d) where appropriate, replacement of specified plants by other plants;

(e) prohibition of planting of new specified plants in the open air in an infested area referred to in point 1(a) of Section 1 of Annex II except for places of production referred to in Section 2 of Annex I;

(f) intensive monitoring for the presence of the specified organism by annual inspections at appropriate times on host plants, including where appropriate targeted destructive sampling; the number of samples shall be indicated in the report referred to in Article 7;

(g) activities to raise public awareness concerning the threat of the specified organism and the measures adopted to prevent its introduction into and spread within the Union including the conditions regarding movement of specified plants from the demarcated area established under Article 6;

(h) where necessary, specific measures to address any particularity or complication that could reasonably be expected to prevent, hinder or delay containment, in particular those related to the accessibility and adequate eradication of all plants that are infested or suspected of infestation, irrespective of their location, public or private ownership or the person or entity responsible for them;

(i) any other measure, which may contribute to the containment of the specified organism.

The measures referred to in points (a) to (i) shall be presented in the form of a report referred to in Article 7.

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LOMBARDY REGION

- GENERAL AGRICULTURAL DIRECTION (DGA) -

1. INSTITUTIONAL ROLE vs EU/MINISTRY/REGIONS
2. PLANNING of all PHYTOSANITARY ACTIVITY
3. CONTROL STRATEGIES: COORDINATION
4. CONTROL MEASURES: ISSUE and RESPONSIBILITY

ERSAF

- REGIONAL AGENCY FOR AGRICULTURAL AND FORESTRY SERVICES -

1. EXECUTION of CONTROL MEASURES
2. NURSERIES INSPECTION
3. MONITORING of TERRITORY
4. IMPORT-EXPORT INSPECTIONS

FONDAZIONE MINOPRIO

- LOMBARDY CENTER OF ORTI-FLORI-FRUITCULTURE AMELIORATION -

1. APPLIED RESEARCH
2. INFORMATION CAMPAIGN
3. PPS LABORATORIES

RegioneLombardia

ERADICATION PROGRAM 2008 - 2010

TOTAL INVESTMENTS 12 MILLION €

ERADICATION PROGRAM 2011- 2013

TOTAL INVESTMENTS 6 MILLION €

ERADICATION PROGRAM 2014 - 2015

TOTAL INVESTMENTS 3 MILLION €

GENERAL SURVEILLANCE
SPECIFIC SURVEY
CHEMICALS
TREE FELLING
TREE REPLACEMENT
REIMBURSEMENT TO NURSERIES
PUBLIC AWARENESS
RESEARCH

SPECIFIC SURVEY
DEMARCATED AREA

- an infested zone which is the area where the presence of *Anoplophora chinensis* (Forster) has been confirmed, and which includes all trees showing symptoms

- a buffer zone with a radius of at least 2 (1) km beyond the perimeter of the infested zone

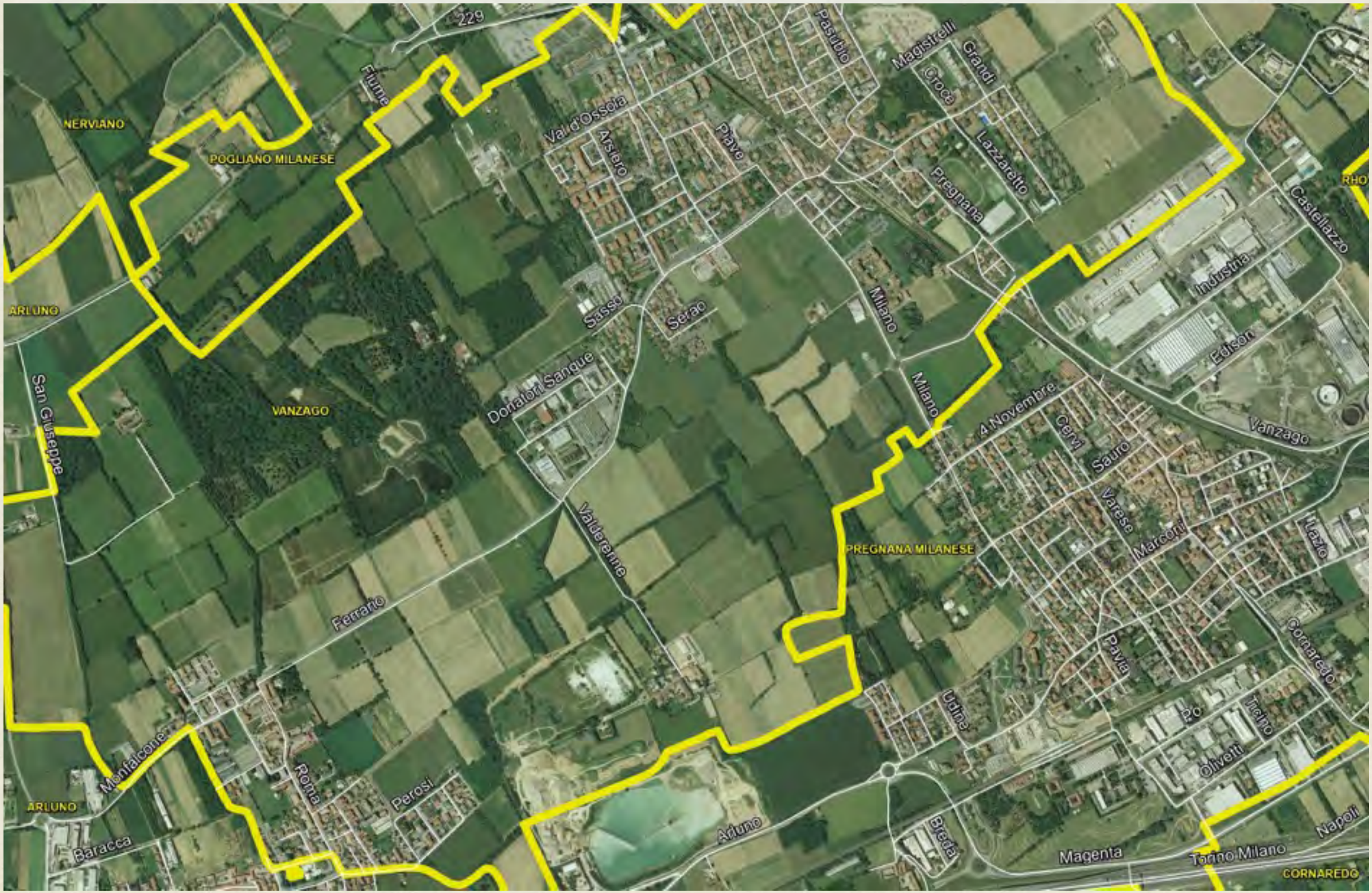
- in the infested zone, all the susceptible trees are inspected, both in public and private areas;

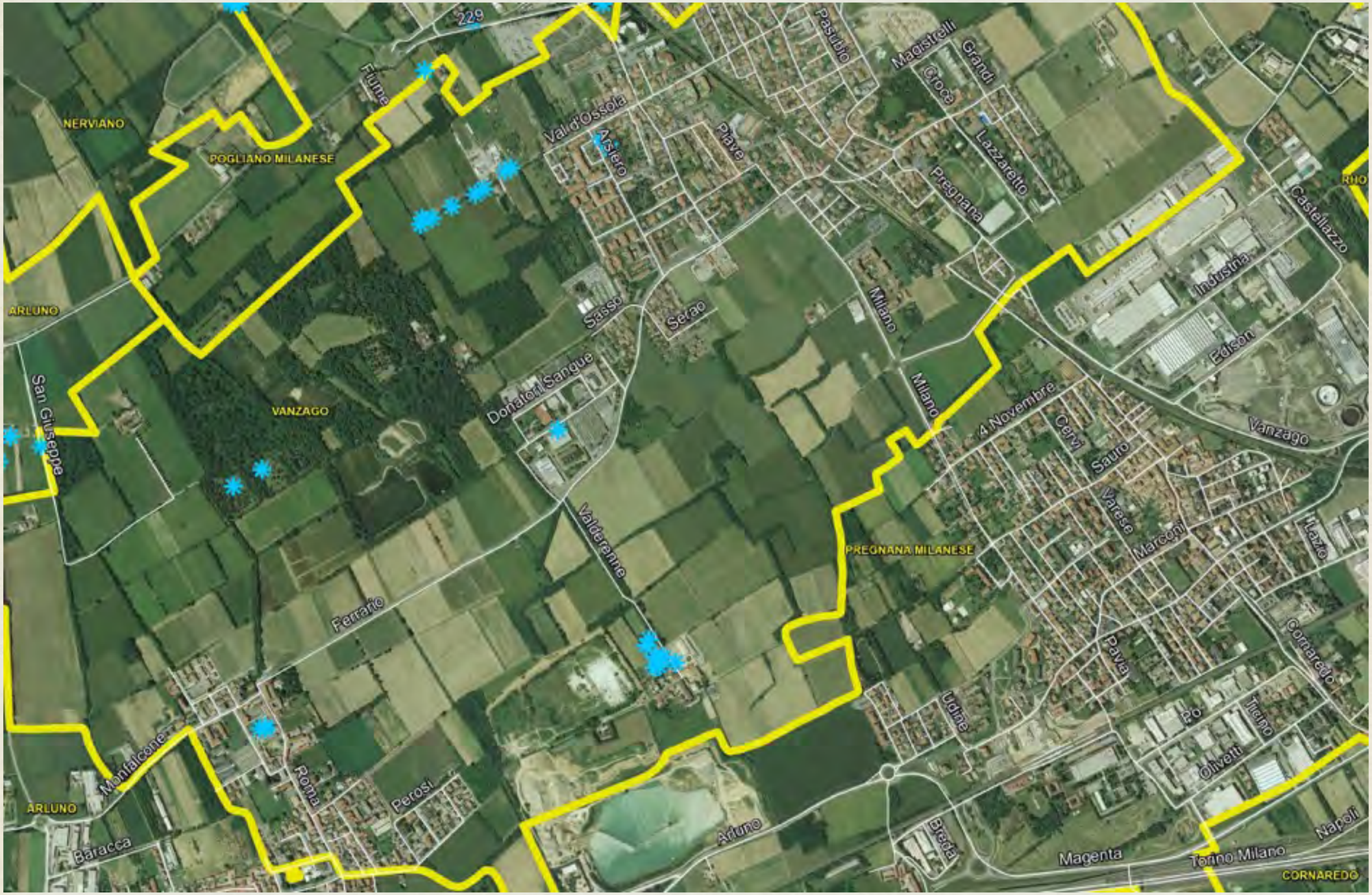
- within the first 500 m of radius of the buffer zone, all the susceptible trees are inspected, both in public and private;
- in the remaining part of the buffer zone, with a lower phytosanitary risk, all the public susceptible trees were/ are inspected. In addition some representative trees in private area are also included in the inspection.

SPECIFIC SURVEY

DEMARCATED AREA

What to do...

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Milano
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Sasso
Serao
Donatori Sangue
San Giuseppe
4 Novembre
Cervi
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Pavia
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Udine
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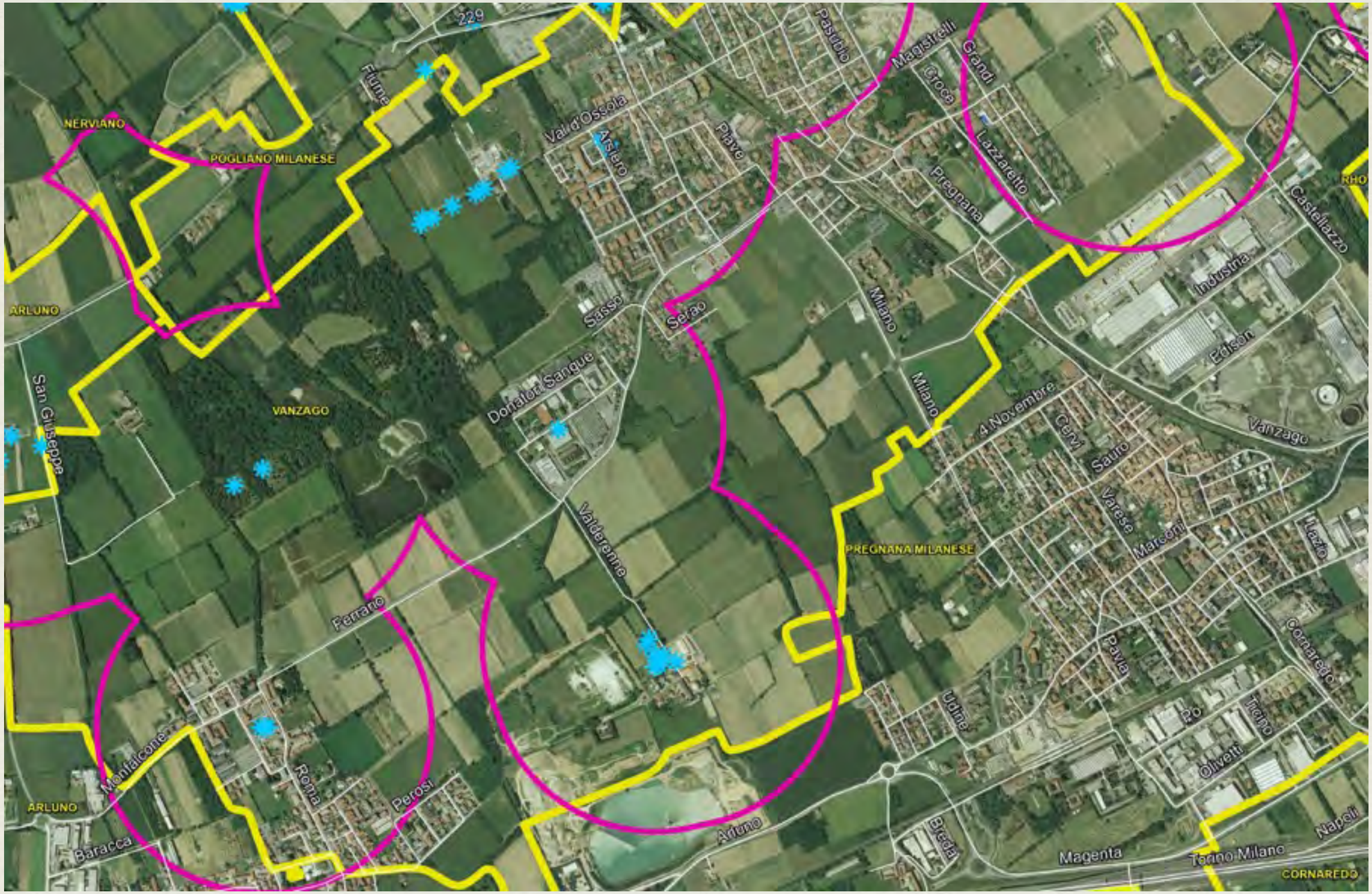
Monfalcone
Baracca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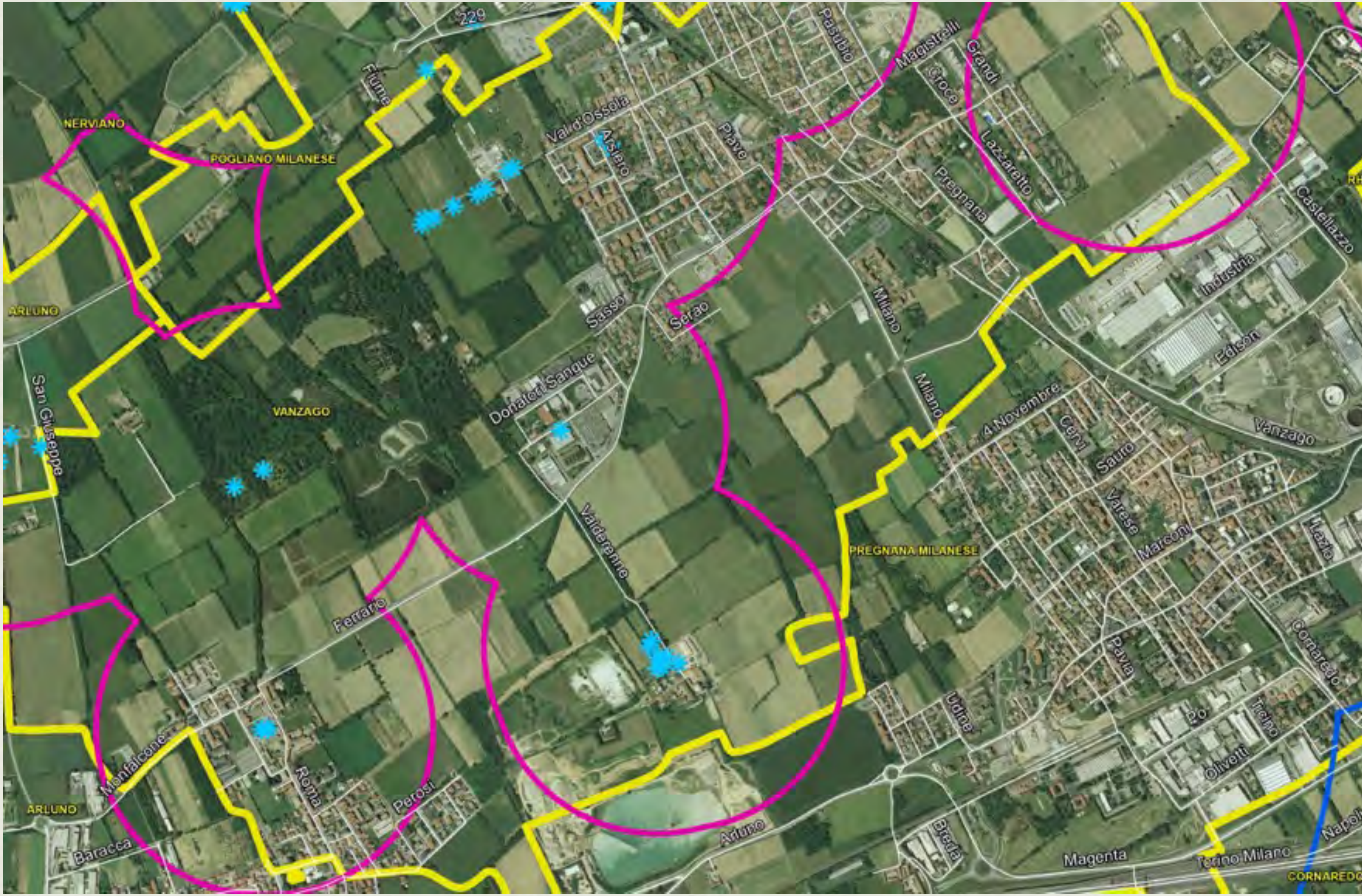
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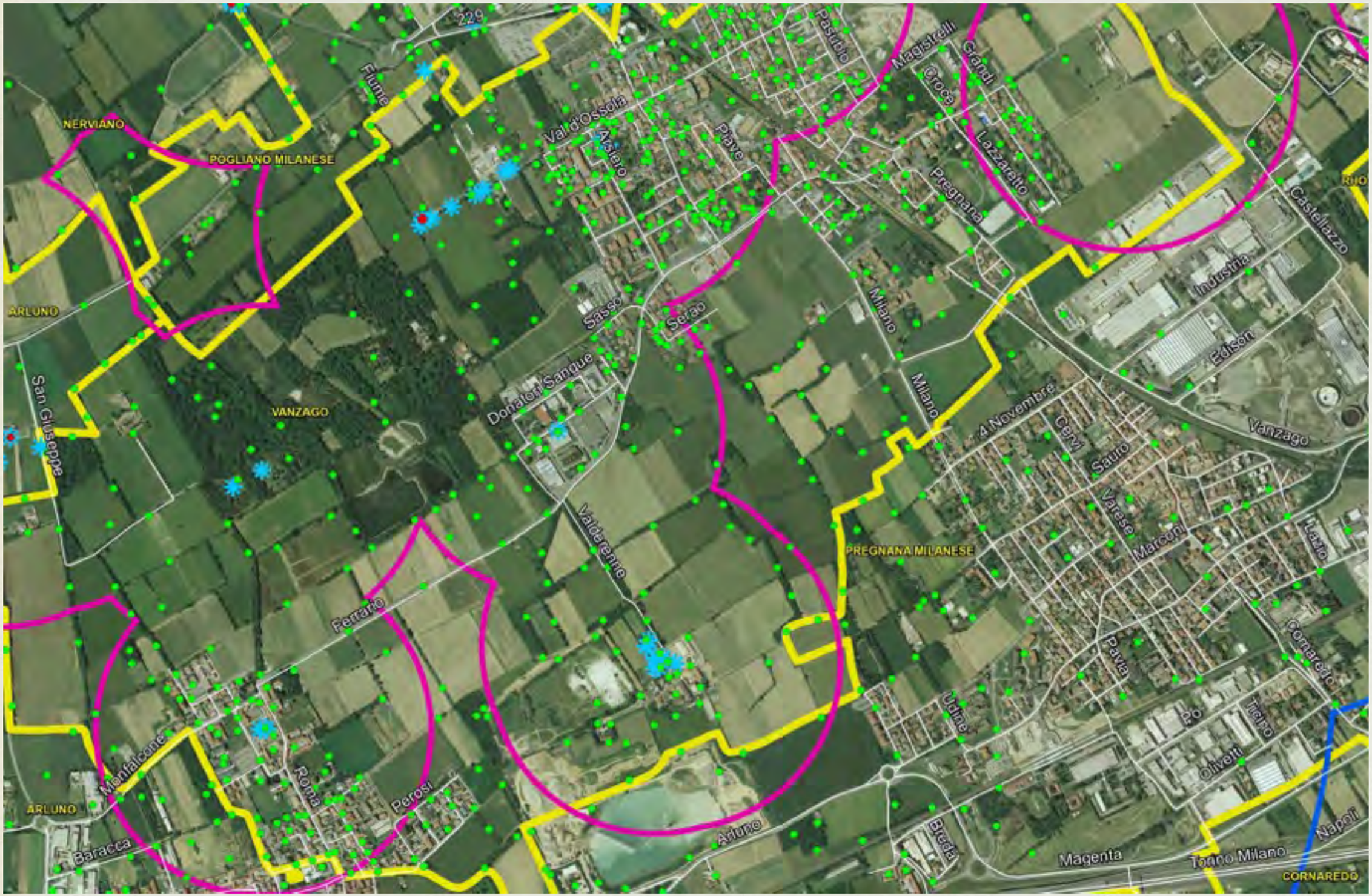
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Vanzago
Lazio
Cornaredo
Po
Trieste
Olivetti
Napoli

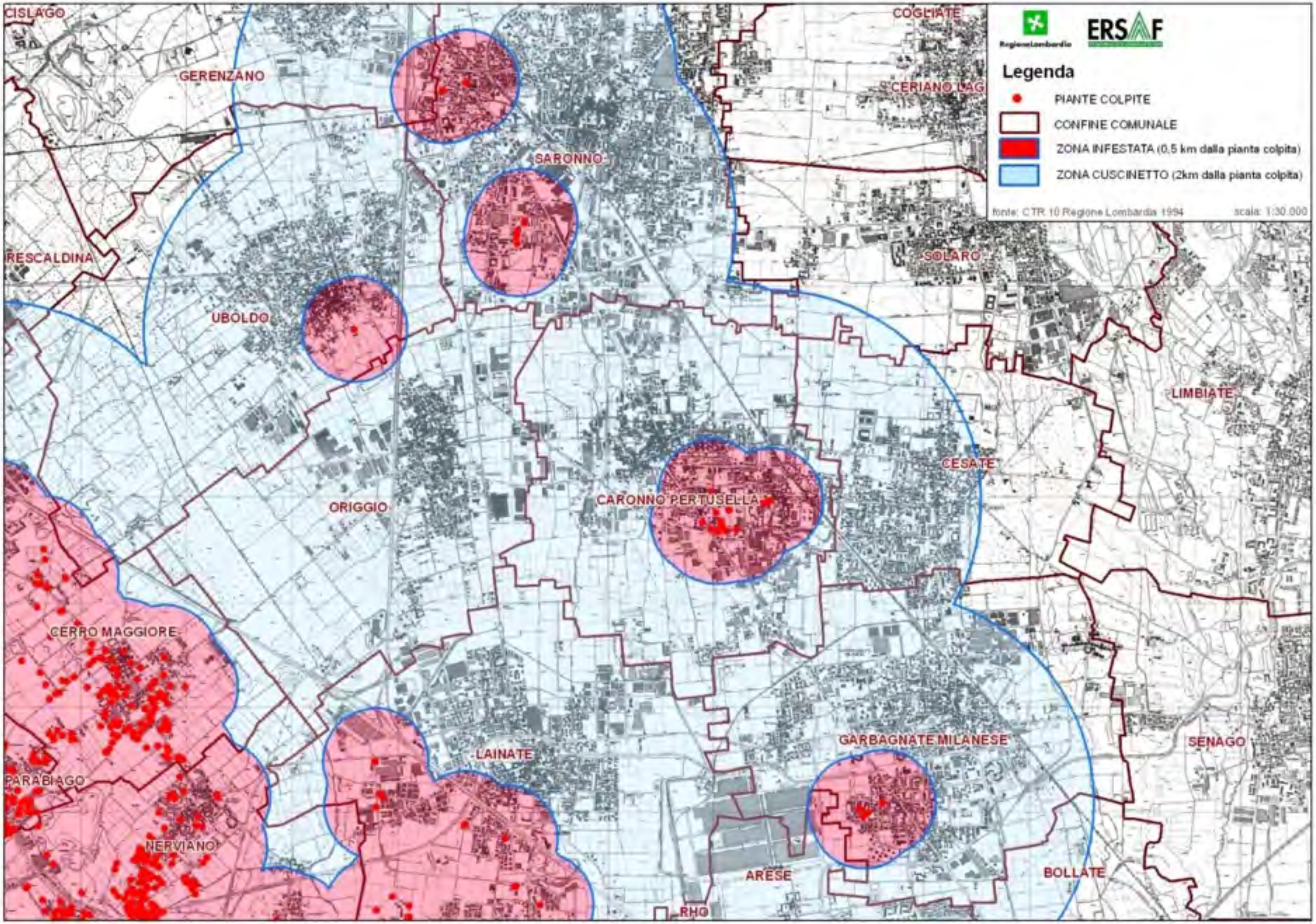
Comune	Rilevatori	ID GPS	n° foto	x	y	Proprietario	Indirizzo	Telefono	E-mail	Data Rilievo	n° pianta	Specie	Pianta Colpite	Tipologia pianta	n° fori	Adulti (si/no)	n° insetti	Note
Vanzago	Zorzi - Longoni - Giannett	van001		1498419,19	5040412,77	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	5	Populus spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van002		1498303,14	5040335,40	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	3	Betula spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van002		1498303,14	5040335,40	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	8	Populus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van003		1498173,32	5040252,87	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van003		1498173,32	5040252,87	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van003		1498173,32	5040252,87	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Betula spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van004		1498053,75	5040473,18	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Populus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van004		1498053,75	5040473,18	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Crataegus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van005		1497920,34	5040522,49	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	25	Betula spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van005		1497920,34	5040522,49	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van005		1497920,34	5040522,49	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	3	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van005		1497920,34	5040522,49	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Acer pseudoplatanus	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van005		1497920,34	5040522,49	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Pyrus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Crataegus spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Acer pseudoplatanus	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	19	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Populus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	7	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van006		1497766,26	5040459,30	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	47	Betula spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van007		1497564,96	5040760,59	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	4	Ulmus spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van008		1497643,61	5040706,20	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Corylus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van008		1497643,61	5040706,20	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Malus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van008		1497643,61	5040706,20	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Cornus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van008		1497643,61	5040706,20	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van008		1497643,61	5040706,20	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van009		1497696,47	5040648,21	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	3	Acer campestre	0		0	no	0	bosco Schneider
Vanzago	Zorzi - Longoni - Giannett	van009		1497696,47	5040648,21	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van009		1497696,47	5040648,21	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Corylus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Carpinus spp.	0		0	no	0	bosco Schneider
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Corylus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	5	Crataegus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Rosa spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van010		1497805,40	5040549,04	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Malus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van011		1497895,81	5040622,13	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Acer campestre	0		0	no	0	bosco Schneider
Vanzago	Zorzi - Longoni - Giannett	van011		1497895,81	5040622,13	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van011		1497895,81	5040622,13	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Cornus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van012		1497707,60	5040686,06	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van012		1497707,60	5040686,06	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van012		1497707,60	5040686,06	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	4	Crataegus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van013		1497685,00	5040803,67	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	9	Ulmus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van013		1497685,00	5040803,67	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van013		1497685,00	5040803,67	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van013		1497685,00	5040803,67	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Cornus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van013		1497685,00	5040803,67	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Pyrus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van014		1498474,87	5041321,33	Privato - Bosco WWF di Vanzago	via Valdosella			26/4/14	7	Platanus spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van015		1498213,81	5040632,80	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Corylus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van015		1498213,81	5040632,80	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	3	Crataegus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van015		1498213,81	5040632,80	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	2	Cornus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van015		1498213,81	5040632,80	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Salix spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van016		1498178,30	5040692,47	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	6	Carpinus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van016		1498178,30	5040692,47	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	3	Crataegus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van017		1498177,38	5040827,86	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	20	Betula spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van017		1498177,38	5040827,86	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Acer campestre	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van018		1498114,28	5040958,00	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	152	Carpinus spp.	0		0	no	0	[illegible]
Vanzago	Zorzi - Longoni - Giannett	van018		1498114,28	5040958,00	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Pyrus spp.	0		0	no	0	
Vanzago	Zorzi - Longoni - Giannett	van018		1498114,28	5040958,00	Privato - Bosco WWF di Vanzago	via delle tre Campane 21			26/4/14	1	Acer campestre	0		0	no	0	
Vanzago	Maschietto - Matarrese	van019		1498888,51	5040193,25	Pubblico	via Valdarenne			19/5/14	10	Crataegus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van019		1498888,51	5040193,25	Pubblico	via Valdarenne			19/5/14	13	Corylus avellana	0		0	no	0	
Vanzago	Maschietto - Matarrese	van020		1498725,56	5040027,07	Pubblico	via Valdarenne			19/5/14	15	Ulmus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van020		1498725,56	5040027,07	Pubblico	via Valdarenne			19/5/14	1	Acer platanoides	0		0	no	0	
Vanzago	Maschietto - Matarrese	van021		1498874,84	5040032,32	Pubblico	via Valdarenne			19/5/14	8	Crataegus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van021		1498874,84	5040032,32	Pubblico	via Valdarenne			19/5/14	10	Ulmus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van021		1498874,84	5040032,32	Pubblico	via Valdarenne			19/5/14	1	Platanus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van021		1498874,84	5040032,32	Pubblico	via Valdarenne			19/5/14	1	Corylus avellana	0		0	no	0	
Vanzago	Maschietto - Matarrese	van022		1499007,01	5040029,48	Pubblico	via Valdarenne			19/5/14	9	Platanus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van022		1499007,01	5040029,48	Pubblico	via Valdarenne			19/5/14	2	Crataegus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van023		1499052,47	5039889,69	Privato	via Valdarenne 1			19/5/14	1	Corylus avellana	0		0	no	0	
Vanzago	Maschietto - Matarrese	van023		1499052,47	5039889,69	Privato	via Valdarenne 1			19/5/14	3	Pyrus spp.	0		0	no	0	
Vanzago	Maschietto - Matarrese	van023		1499052,47	5039889,69	Privato	via Valdarenne 1			19/5/14	20	Prunus laurocerasus	0		0	no	0	

An hypothetical NEW OUTBREAK....

Clear cut within 100 mt!

2 kms Demarcated Area

MAP OF A WORKING AREA (2009)



INFORMATION TO MUNICIPALITIES AND RESIDENTS

ERSAF

RegioneLombardia

Prot. n.

Milano,

RegioneLombardia
Giunta
AGRICOLTURA
Partenza 21/07/2009 11:46
M1.2009.0014237 21/07/2009 11:46

Al Sindaco del Comune
di Montichari (Bs)
Dott.ssa Elena Zanola

Oggetto: "Tarlo asiatico" – campagna di monitoraggio anno 2009.

Come a Sua conoscenza, in diversi Comuni situati nelle provincie di Milano, Varese e Brescia, è stata rilevata la presenza del coleottero di origine asiatica *Anoplophora chinensis*.

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Presidente ERSAF
Roberto Albetti

Assessore all'Agricoltura
Luca Daniel Ferrazzi

Per informazioni: 02 67404860
anoplophora@ersaf.lombardia.it

Allegati: D.d.s. 12 marzo 2009 n. 2408, D.d.s. 23 aprile 2009 n. 3983, pieghevole "Tarlo asiatico"

E.R.S.A.F. *Ente Regionale per i Servizi all'Agricoltura e alle Foreste*
Via Copernico, 38 - 20125 Milano Tel. 0267404 1 Fax 0267404299
www.ersaf.lombardia.it C.F. e P.IVA 03608120969

TARLO ASIATICO, UN PERICOLO PER IL NOSTRO AMBIENTE.

ATTENZIONE!
QUESTO INSETTO È INNOCUO PER L'UOMO, MA PERICOLOSISSIMO PER LE NOSTRE PIANTE.

Quest'insetto di origine asiatica si nutre di legno. Dopo essersi insediato in un albero, si riproduce velocemente e ne divora l'interno.
Se lo vedi, segnalalo immediatamente ai seguenti recapiti:

- **840.000.001** (solo da telefono fisso, costo 1 scatto alla risposta)
- **02.69.96.70.01** (da cellulari, costo in base all'operatore telefonico)
- **tarloasiatico@regione.lombardia.it**

Il tuo contributo può salvare molte piante della Lombardia.

Per saperne di più: **www.agricoltura.regione.lombardia.it**

RegioneLombardia

Local police

- inside urban areas/private properties -

Forestry police
- inside natural environment -

In Lombardy Region: STAFF TRAINING

- TEAMS OF TWO PEOPLE (almost 30 people)

- TECHNICAL STAFF MUST HAVE UNIVERSITY DEGREES AND EXPERIENCE IN RELATED FIELD

Training procedure:

- 1 DAY OF CLASSROOM TRAINING
- 1 WEEK OF FIELD TRAINING IN OUTBREAK AREAS

- ENGAGED FOR 4-5 MONTHS

- A PHYTOSANITARY INSPECTOR HAVE TO ASSIST THEM IN EACH MACRO-AREA OF WORK

- APPROPRIATE UNIFORMS WERE PROVIDED THEM, TO BE RECOGNIZABLE

- TOOLS NECESSARY FOR THE INSPECTION (GPS instrument, hummer and chisel, cellphone, camera/smartphone, shears, axe, vials, sampling boxes, etc...)

Survey

Public awareness

© Matteo Maspero

Tree felling

In Lombardy
since 2001
more than 30.000
trees removed

GPS INSTRUMENTS

Inspectors are looking for Signs and Symptoms

Mainly:

Exit holes

Piles of frass

Adults

SURVEY FORM

ANNALI
SCHEDA MONITORAGGIO ANOPLOPHORA CHINENSIS — RILEVATORI: BIANCHI — COMUNE: UBOLDO — DATA: 10/06/2009

GPS	NOMINATIVO PROPRIETARIO AMM. CONDOMINIO	INDIRIZZO	N° CIVICO	TELEFONO	N° PIANTE/ ML SIEPE	SPECIE	PIANTA COLPITA (0-1)	N° FORI	N° ROSURE	ADULTI	NOTE
	GIARDINO/ [illegible]	VIA 4 NOVEMBRE	123	02 96789[illegible]	1	ACER PALMATUM	0	0	0	0	
		"	"		7 ml	PRUNUS L.	0				
		"	"		1	PRUNUS L.	0				
		"	"		10 ml	PRUNUS L.	0				
		"	"		1	CRATAEGUS SPP.	0				
		"	"		5	ROSA SPP.	0				
		"	"		11	CORYLUS AVELLANA	0				DIFFICILMENTE MONITORABILI TUTTI DA TAGLIARE!
		"	"		1	CORYLUS AVEL.	1	3	0	3	1 MASCHIO E 1 FEMMINA CONSEGNATI DA [illegible]
	PRIVATO - CONDOMINIO	VIA PADRE CELSO TRONCONI	14		1	ACER PALMATUM	0				
	"	"	14		2	ACER SACCH.	0				
	"	"	14		2	BETULA SPP.	0				
	"	"	14		2	FAGUS SPP.	0				
	"	"	14		7	ROSA SPP.	0				
	PUBBLICO	"			1	BETULA SPP.	0				PIANTA DI FRONTE A CONDOMINIO CIVICO 14
	PRIVATO - CONDOM.	VIA PADRE CELSO TRONCONI	14		1	ACER PLATANOIDES	0				


P.d.Francesca

Chipping of aerial part of the infested trees

Grinding of the infested stumps


Vermeer
SC50TX


SC652
Vermeer


PERICOLO
PERICOLO
AutoSweep

Some situations to remove infested plants are more tricky…

Before...

...after!

The first question you've to answer is:

Why *Anoplophora* is a QUARANTINE PEST?

Because…

DAMAGE

…it damage trees by digging galleries inside the wood. Exit hole are also a pathway for other pathogens (fungi, bacteria, virus) which contributes to the tree's decline.
Almost all the broadleaves are hosts of this pest while coniferous species are not susceptible.

Because…

NURSERIES & TRADERS

… it damage
tree productions and
commercial system

Because...

LOSS OF GREEN AREAS & BIODIVERSITY

... it attacks urban forests, causing loss in biodiversity
... it could enter forests and woodlands

Bosco in Città - Milano

WHY A SO IMPORTANT INFORMATION CAMPAIGN?

Because the stakeholders are not only nurseries and farmer's owners, but also public authorities involved in green keeping and landscape maintenance (so, difficult to reach with our usual communication channels)

Because the contingency and the survey of this pest is compulsory, but it is impossible in the mean time , for the PPS's staff, to reach ALL the susceptible trees!

It is very important to inform all the residents, to notify to the PPS the possible presence of this insect or its symptoms.

- The message -

"*Anoplophora* is not dangerous for humans, but is a big threat for our trees and the environment as well!"

PUBLIC AWARENESS

Often occurs that CLB infestations are undetected for years and years, allowing the specie to spread through the new environment, reaching levels of population that are then difficult to be eradicated.

Therefore EARLY DETECTION is the first goal to achieve.

Templates are also available on the EPPO web-site!

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

Home
About EPPO
Meetings
Plant quarantine
Plant Protection Products
Invasive alien plants
Standards
Databases
Publications
Worldwide activities

EPPO poster and leaflet
- Don't Risk It! -

In 2013, EPPO published a poster 'Don't Risk It' together with an accompanying leaflet. The objective of these documents is to raise public awareness about the risks of moving plants and their associated pests during international travel and to encourage responsible behaviour. It is primarily intended that the poster should be displayed in airports or any other sites where international travellers will see it (e.g. seaports, railway stations, travel agencies, embassies). This poster was endorsed officially by the EPPO Executive Committee in April 2013 and circulated to all EPPO member countries in May 2013. National Plant Protection Organizations (NPPOs) are strongly encouraged to contact airport authorities or any other relevant bodies so that the poster can be displayed as widely as possible.

Download the poster (pdf files - A1, A2, A3 format - in English and French)

- poster A1 format (594 x 841 mm) | poster version française A1
- poster A2 format (420 x 594 mm) | poster version française A2
- poster A3 format (297 x 420 mm) | poster version française A3

Download the leaflet (pdf files - in English and French)

- leaflet | dépliant

In the initial phase of the survey, you might need to be accompained by local authority!

✓ informative paper materials (**2.5 million copies 2008/10**).
✓ TV spots
✓ web sites
✓ Info Points in public areas
✓ two phone numbers (free from charge)
✓ two e-mail address
✓ press release

The Regional Councillor sent a letter, including informative materials to all the:

- ✓ Mayors of the municipalities/provinces/forestry services
- ✓ Nurseries and Garden Centers

COMMUNICATION TO MUNICIPALITIES, PARKS, RANGERS AND CITIZENS

ERSAF

RegioneLombardia

Prot. n.

Milano,

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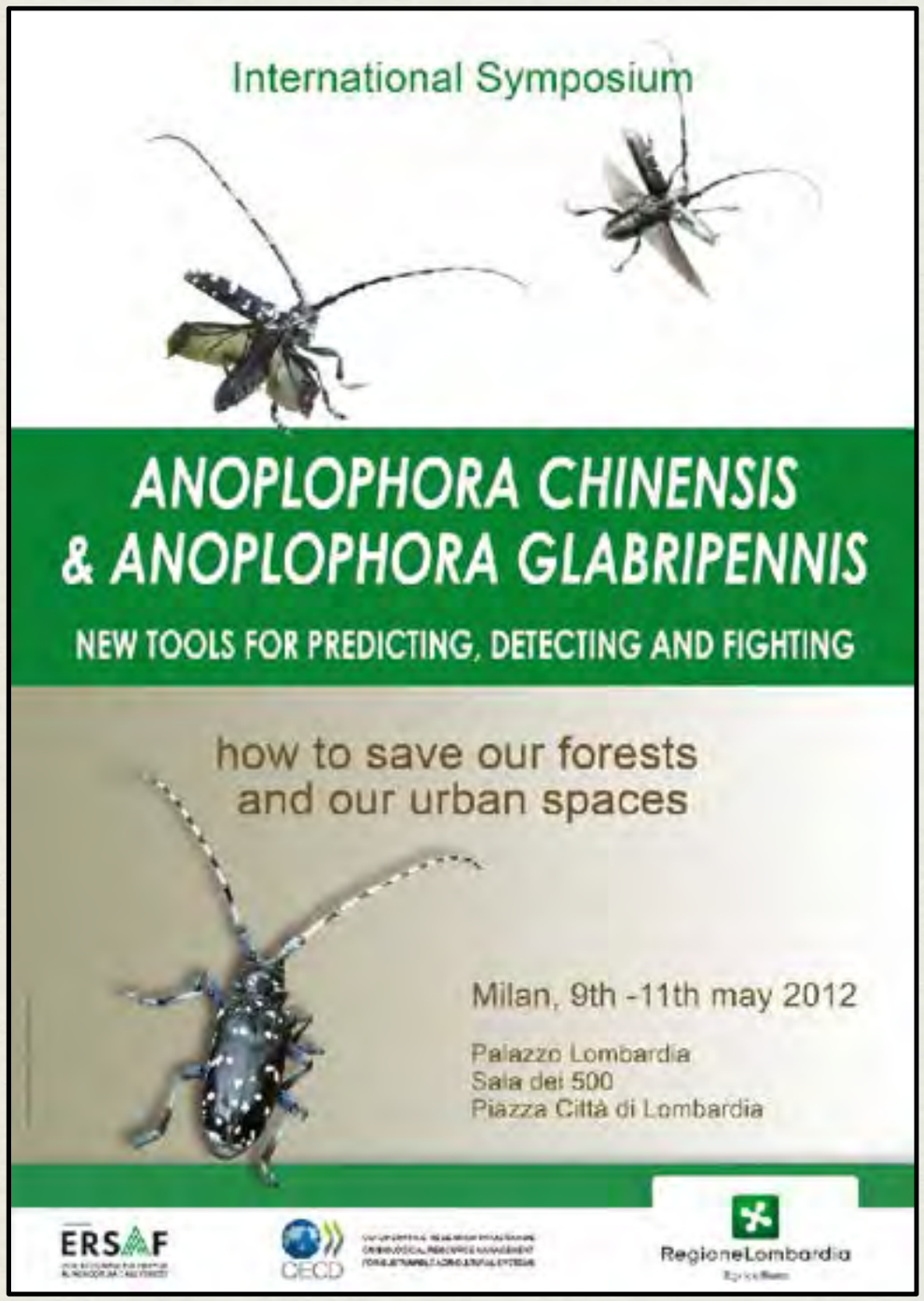
www.ersaf.lombardia.it C.F. e P.IVA 03606930960

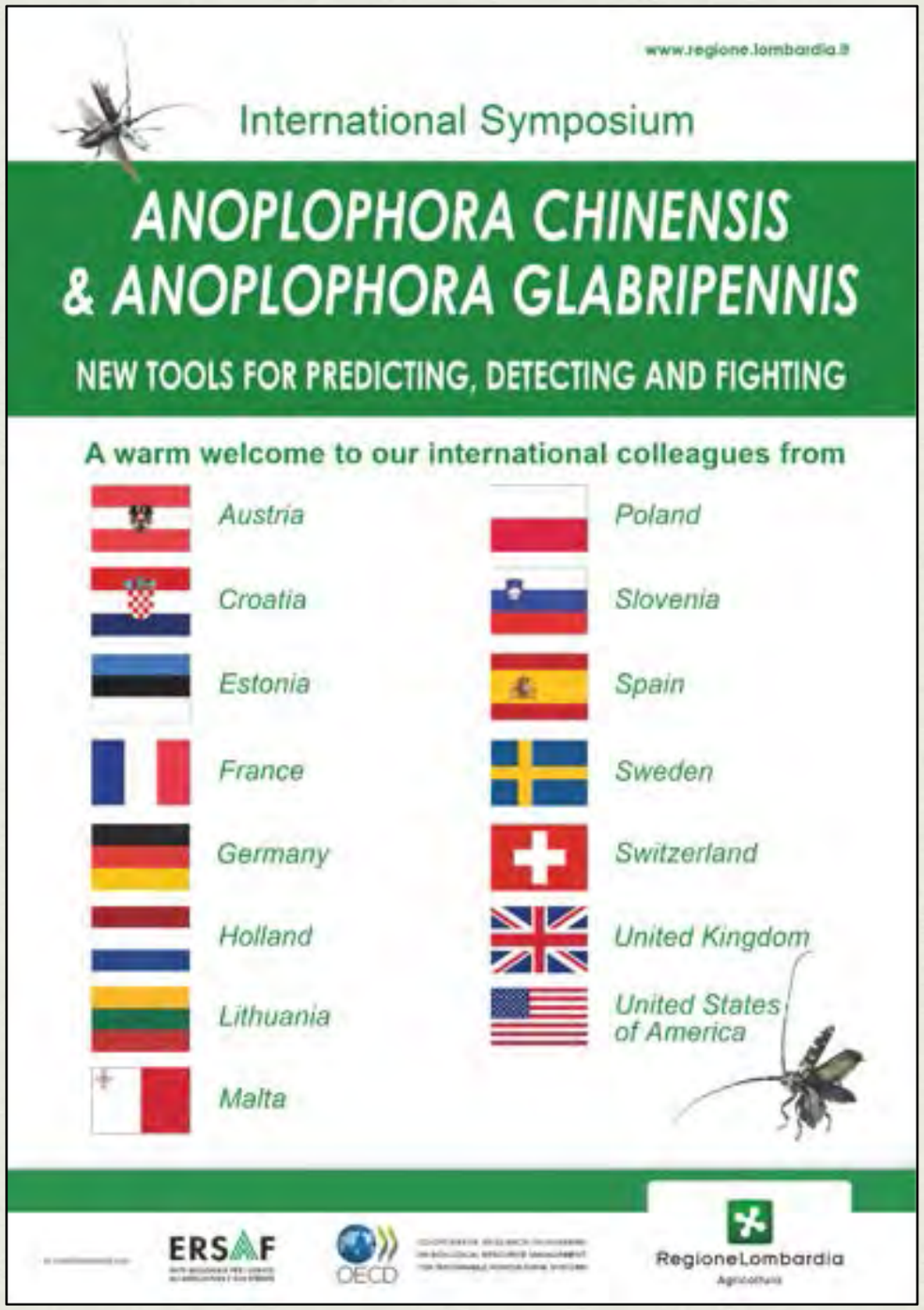
COMMUNICATION TO NURSERY OWNERS AND LANDSCAPERS

PRESS CONFERENCE

PUBLIC MEETINGS

INTERNATIONAL CONGRESSES





Totale Passaggi	14-29	30-45	46-64	+65
Età	3.018.778	2.831.385	2.256.182	1.092.025

Totale Passaggi	Casa	Gestione fam.	Lavoro	Studio	Tempo libero
Motivo	4.600.546	858.965	2.161.283	780.327	797.248

New name:
"TARLO ASIATICO"
Asian wood borer


TARLO ASIATICO,
UN PERICOLO
PER IL NOSTRO AMBIENTE
© Matteo Maspero
2011

VOICE MAIL + MAIL BOX

The communication campaign is repeated every year since 2008

- ✓ **IN 2008 about 500 contacts**
- ✓ **IN 2009 1069 contacts**
- ✓ **IN 2010 1447 contacts**
- ✓ **IN 2011 835 contacts**
- ✓ **IN 2012 1338 contacts**

RESULTS

The survey carried out by citizens showed a very high level of effectiveness.

In 2008 a new outbreak in Brescia province (150 kms far from Milano) thanks to 11 simultaneous call by residents living in a small Municipality.

Some outbreaks in Milano area, included the one at “Parco delle cave/Bosco in città” were found thanks to citizen’s cooperation.

The communication campaign allowed to the PPS, to discover two additional alien pests:
Psacothea hilaris and *Aromia bungii*

CONCLUSIONS

Early detection allow to contain the eradication cost.

The Lombardy PPS requested and obtained from European Commission that the costs of the information campaign were eligible for the solidarity dossiers.

Now.. public awareness has been recognized as a phytosanitary measure from the European Commission

New EC emergency decisions require to the MSs to develop public awareness campaign.

How much does it costs a huge Information Campaign?

Some examples...

Anno 2008

Campagna di comunicazione finalizzata alla conoscenza di *Anoplophora* rivolta ai cittadini

La prevista campagna di comunicazione ai cittadini è stata realizzata attraverso l'impiego di molteplici strumenti: poster e locandine da affiggere nei Comuni interessati, un video contenente uno spot televisivo per favorire la conoscenza dell'insetto, numerosi interventi su emittenti televisive locali, incontri informativi pubblici tenuti dall'esperto di Anoplophora dott. Matteo Maspero della Fondazione Minoprio.

Complessivamente gli interventi realizzati sono descritti di seguito:

1. **Realizzazione e predisposizione supporti divulgativi:**
   - campagne di informazione a mezzo stampa di Poster e Locandine sul Tarlo Asiatico realizzate da Arti Grafiche Maspero Fontana (€ 24.592,00).

2. **Realizzazione di campagne d'informazione:**
   - video Spot pubblicitario per la campagna di informazione televisiva sul Tarlo Asiatico realizzato da White Fox Communications (costo € 12.300,00);
   - distribuzione manifesti Tarlo Asiatico mediante IGP Decaux (€ 21.675,00);
   - veicolazione della locandina sul Tarlo Asiatico attraverso Mondadori Pubblicità SpA (€ 41.255,00);
   - campagna pubblicitaria Tarlo Asiatico sulle emittenti televisive Espansione TV e Rete 55 (PSR TV) (€ 3.360,00);
   - spot pubblicitari Tarlo Asiatico su emittente Telesettelaghi (€ 2.400,00);
   - campagna di comunicazione pubblicitaria Tarlo Asiatico su emittenti televisive Teletutto e BS Telenord (Numerica Pubb.) (€ 2.600,00);
   - campagna pubblicitaria Tarlo Asiatico sulle emittenti televisive 7Gold Lombardia e Milano+ (Publirose) (€ 5.460,00);
   - spot pubblicitari Tarlo Asiatico su emittente televisiva Brescia Punto TV (Publiadige) (€ 2.006,70);
   - tabellare informativo su Bell'Italia (Cairo Pubblicità) (€ 1.250,00);
   - testata pubblicitaria su Acer – Il Verde Editoriale (€ 833,33);
   - servizio Catering in occasione di incontri stampa mediante Parma Allestimenti (€ 400,00).

Spesa: **€ 150.000,00**

Anno 2009

Campagna di comunicazione finalizzata alla conoscenza di *Anoplophora* rivolta ai cittadini

Le attività di comunicazione sono state completate entro il 31 agosto 2009 e sono state già riporta nella relazione intermedia. Esse hanno riguardato:

1. Stampa e ristampa di:
   450 poster formato cm 140 x 200
   270 poster formato cm 100 x 140
   5.000 poster formato cm 68 x 98
   50.000 pieghevoli formato aperto cm 29,7 x 21
   255.000 locandine formato cm 21 x 29,7
   217.250 locandine formato cm 18,9 x 25

2. Affissioni in 82 stazioni della Metropolitana di Milano di complessivi 187 poster

3. Diffusione locandine a mezzo stampa di complessive 32.000 locandine sulle seguenti testate mensili:
   Gardenia (giugno 2009)
   Bell'Italia (giugno 2009)

.....

10. Campagna pubblicitaria sulle seguenti emittenti televisive:
    Telelombardia
    Antenna 3
    Teletutto
    Tele 7 Laghi
    Rete 55

11. Spedizione a mezzo posta di lettera dell'Assessore insieme a materiale informativo (locandine, pieghevoli e poster) a:
    Comuni lombardi
    Province lombarde
    Comunità montane lombarde
    2056 aziende florovivaistiche lombarde

12. Consegna materiale informativo a Spazio Regione e alla Direzione Generale Qualità dell'Ambiente per l'invio ai parchi.

Spesa: **€ 65.000,00**

Interruzione pagina

CAMPAGNA:	Tario Asiatico 2014
PERIODO:	Luglio 2014
REVISIONE:	Milano, 28 Luglio 2014

MEZZO	CONCESSIONARIO	VEICOLO/EMITTENTE	FORMATO		# USCITE / SPOT	NET NET TOTALE
STAMPA						
	OPQ	Eco di Bergamo	Quarto di Pagina	136,5 x 174 mm	1	
		Giornale di Brescia	Quarto di Pagina	136 x 171,45 mm	1	
		La Provincia Como-Lecco-Sondrio	Quarto di Pagina	136,5 x 174 mm	1	
		Il Cittadino di Lodi (lun-sab)	Quarto di Pagina	117,4x160,4	1	€ 5.822,4
		Il Cittadino di Monza e Brianza (gio/sab)	Quarto di Pagina	136,5 x 174 mm	1	
		La Voce di Mantova	Quarto di Pagina	137 x 184 mm	2	
		La Provincia di Varese	Quarto di Pagina	136,5 x 174 mm	1	
	PUBLIA	Provincia di Cremona	Quarto di Pagina	137 x 197 mm	1	€ 907,0
					9	**€ 6.729,4**
TV				**Fascia Oraria**		
	TELELOMBARDIA SRL	TELELOMBARDIA	30 sec	Fascia 7:00-9:30 - OMAGGIO	10	€ -
			30 sec	Fascia 18:00-20:30	10	€ 500,0
			30 sec	Fascia 20:30-23:00	10	€ 500,0
			30 sec	Fascia 23:00-1:00	10	€ 500,0
		ANTENNA 3	30 sec	Fascia 12:00-13:00 - OMAGGIO	10	€ -
			30 sec	Fascia 17:30-20:30	10	€ 400,0
			30 sec	Fascia 20:30-23:00	10	€ 400,0
			30 sec	Fascia 23:00-1:00	10	€ 400,0
		MILANOW	30 sec	Fascia 7:00-24:00	100	€ 1.000,0
			30 sec	Fascia 7:00-24:00 - OMAGGIO	50	€ -
	INDACO SRL	TELENOVA2	30 sec	Fascia 13:00-15:00	90	€ 1.666,7
			30 sec	Fascia 19:00-23:00	210	
		TELENOVA	30 sec	Fascia 20:30-23:00	180	€ 1.666,7
			30 sec	Fascia 18:30-20:30	120	
		TELENOVA2	2 min	intervista - OMAGGIO	1	€ -
		TELENOVA	2 min	intervista - OMAGGIO	1	€ -
	TELESETTELAGHI SRL	TELESETTELAGHI	30 sec	Fascia Tg 17:00-17:15	10	€ 150,0
			30 sec	Fascia Tg 18:00-18:15	10	€ 150,0
			30 sec	Fascia Tg 12:00-14:30	8	€ 120,0
			30 sec	Fascia Tg 19:00-19:30	18	€ 270,0
			30 sec	Fascia Tg 22:00-22:30	18	€ 270,0
			30 sec	Fascia Tg 24:00-24:30 - OMAGGIO	12	€ -
			30 sec	Fascia Tg 19:00-20:00	3	€ 45,0
			30 sec	Fascia Tg 21:30-22:30	3	€ 45,0
			30 sec	Fascia Tg 24:00-1:00 - OMAGGIO	2	€ -
					916	**€ 8.083,33**
AFFISSIONE				**Formato**		
	IGP DECAUX	Circuito MINI	Manifesti	300x140	30	€ 13.000,0
			Manifesti	420x200	70	
					100	**€ 13.000,00**
Total Spending						**€ 27.812,70**

Sconto Starcom (4%)	|	26.700,19
Starcom fee (1,8%)	|	480,60
Spese Tecnich	|	2.950,00
Total budget	|	**30.130,79**
IVA 22%	|	6.628,77
Total budget costo cliente	|	**36.759,57**

Risultati di Comunicazione	
Target Adulti +18 anni Lombardia	
Entità	8.507.000
GRP's Totali	26,8
Copertura %	18%
Frequenza	1,5


SPOT 60' con sottotitoli WMV
00:38
11:59
14/04/2014

Spot Aromia Bungii - YouTube - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Spot Aromia Bungii - YouTube | Search Results | Google Accounts

https://www.youtube.com/watch?v=hgAPr3-odXQ

Cookies help us deliver our services. By using our services, you agree to our use of cookies. Learn more Got it

YouTube GB

Spot Aromia Bungii

PSR Campania 135 videos

Subscribe 34

403 views

1 0

Like About Share Add to

Published on 28 Feb 2013

Campagna pubblicitaria realizzata con il cofinanziamento

Lombardy poster

Hungarian leaflet

Czech leaflet

Anoplophora chinensis
(Forster) 1771
Fúzač čínsky (citrusový)
Citrus Long-Horned Beetle

TAXONOMICKÉ ZARADENIE:

Class: *Insecta* – **hmyz**, Ordo: *Coleoptera* Linné 1758 – **chrobáky**, Familia: *Cerambycidae* Latreille 1804 – **fúzačovité**, Genus *Anoplophora* Hope 1839– **(fúzač)**, Species: *chinensis* (Forster) 1771 – **(čínsky, citrusový)**

HOSTITEĽSKÉ RASTLINY:

Rody podľa Rozhodnutia komisie 2008/840/ES

- *Acer* – javor
- *Aesculus* – pagaštan
- *Alnus* – jelša
- *Betula* – breza
- *Carpinus* – hrab
- *Citrus* – citrónovník
- *Corylus* – lieska
- *Cotoneaster* – skalník
- *Fagus* – buk
- *Lagerstroemia* – lagerstrémia
- *Malus* – jabloň
- *Platanus* – platan
- *Populus* – topoľ
- *Prunus* – slivka
- *Pyrus* – hruška
- *Salix* – vŕba
- *Ulmus* – brest

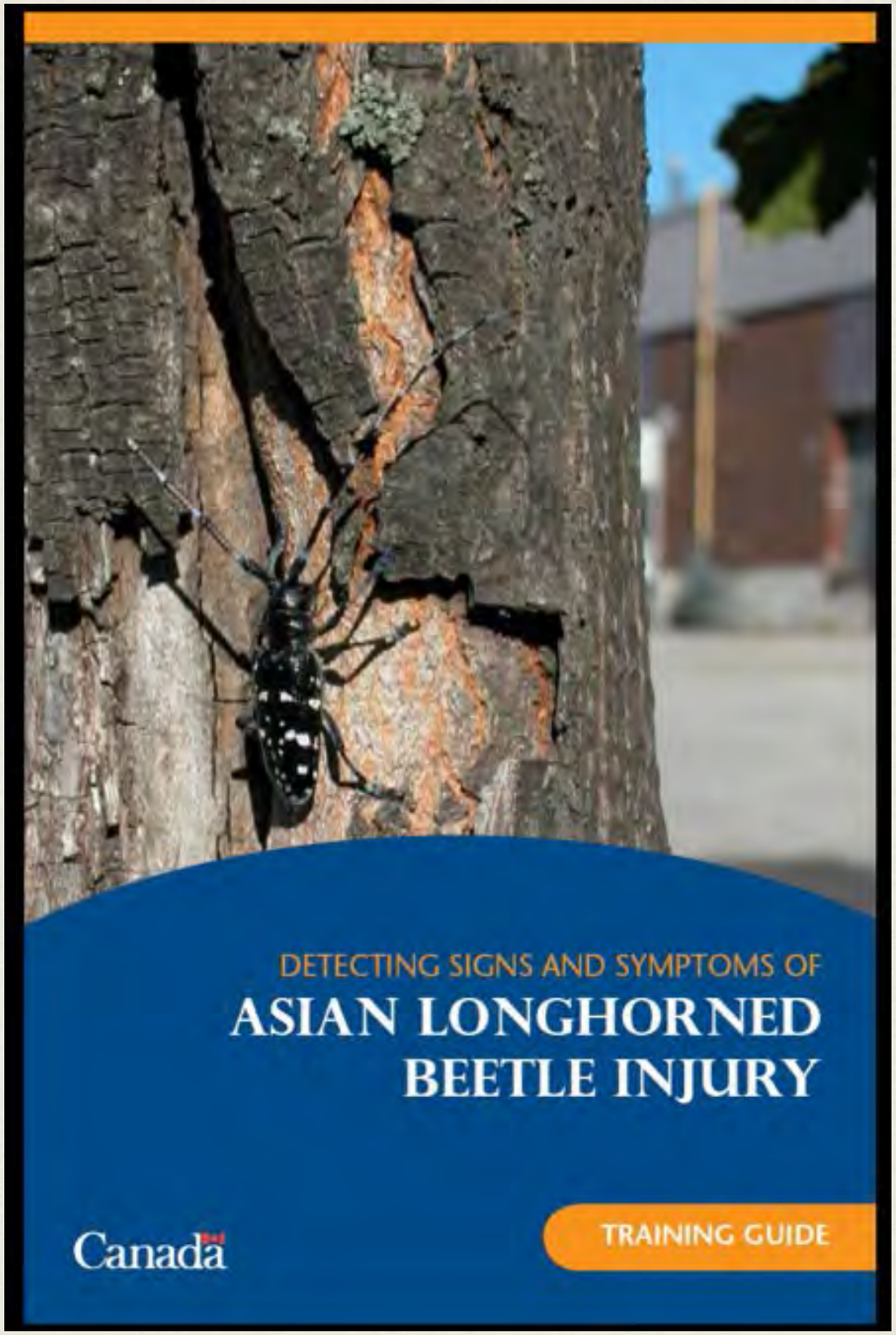
Hostiteľské rastliny napáda v ich rôznom stupni vitality (zdravé, porúbané, odumierajúce). Je technickým škodcom dreva.

PRÍZNAKY:

– na prítomnosť škodcu poukazuje trus hmyzu a drvina vytláčané z diery
– vytvára tunel v konároch a pni, spočiatku pod kôrou, neskôr prechádza do dreva

poškodenie stromov chrobákom *Anoplophora chinensis*

Canadian Field guide



As the number of removed infested trees continues year after year to be high, research on biology of the pest and its NATURAL ENEMIES, together with EARLY DETECTION TECHNIQUES,are fully justified

The identification of biological control methods that could target beetles at these stages would therefore be a useful tool in controlling outbreaks of both species.

- **biological control agents** which are self-replicating after release, such as parasitic insects

- **biopesticides** that are applied in a similar manner to conventional insecticides.

GOOD FOR CONTROL NOT FOR THE ERADICATION

…. However, as the juvenile stages of wood boring insects develop within wood they have natural protection from most non-specialist control agents….

Mini-review

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Prospects for the use of biological control agents against *Anoplophora* in Europe

Thomas Brabbs,[a] Debbie Collins,[a] Franck Hérard,[b] Matteo Maspero[c] and Dominic Eyre[a*]

Abstract

This review summarises the literature on the biological control of *Anoplophora* spp. (Coleoptera: Cerambycidae) and discusses its potential for use in Europe. Entomopathogenic fungi: *Beauveria brongniartii* Petch (Hypocreales: Cordycipitaceae) has already been developed into a commercial product in Japan, and fungal infection results in high mortality rates. Parasitic nematodes: *Steinernema feltiae* Filipjev (Rhabditida: Steinernematidae) and *Steinernema carpocapsae* Weiser have potential for use as biopesticides as an alternative to chemical treatments. Parasitoids: a parasitoid of *Anoplophora chinensis* Forster, *Aprostocetus anoplophorae* Delvare (Hymenoptera: Eulophidae), was discovered in Italy in 2002 and has been shown to be capable of parasitising up to 72% of *A. chinensis* eggs; some native European parasitoid species (e.g. *Spathius erythrocephalus*) also have potential to be used as biological control agents. Predators: two woodpecker (Piciformis: Picidae) species that are native to Europe, *Dendrocopos major* Beicki and *Picus canus* Gmelin, have been shown to be effective at controlling *Anoplophora glabripennis* Motschulsky in Chinese forests. The removal and destruction of infested and potentially infested trees is the main eradication strategy for *Anoplophora* spp. in Europe, but biological control agents could be used in the future to complement other management strategies, especially in locations where eradication is no longer possible.
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Keywords: non-native; *Steinernema*; *Aprostocetus*; *Spathius*; entomopathogenic fungi; *Trigonoderus*

1 INTRODUCTION

Anoplophora chinensis Forster (Coleoptera: Cerambycidae), citrus longhorn beetle (CLB), and *Anoplophora glabripennis* Motschulsky (Coleoptera: Cerambycidae), Asian longhorn beetle (ALB), are pests of trees and shrubs that are native to China and Korea, and in the case of *A. chinensis* also in Japan and some south-east Asian countries.[1] There have been several outbreaks of these two species in Europe, with breeding populations of *A. chinensis* found in Croatia, France, Italy and the Netherlands[2–6] and breeding populations of *A. glabripennis* found in Austria, France, Germany, Switzerland, Italy, the Netherlands and the United Kingdom, some of which have been eradicated.[3,7–17] In these countries the pests were or

wood, they have natural protection from most non-specialist control agents. Current research on biological control has focused on five areas: entomopathogenic fungi, parasitic nematodes, entomopathogenic bacteria, parasites and parasitoids and predators. In the following sections we will review the literature concerning each of these groups of biological control agents, after which we will discuss the prospects for their use in Europe.

2 ENTOMOPATHOGENIC FUNGI

Certain fungal species can infect insects, and a number of studies have sought to identify such species for *Anoplophora*. Five species

Current research on biological control has focused on five areas and these are:

PATHOGENS

- Entomopatogenic fungi
- Nematods
- Bacterial

PREDATORS

... in one or more life stages they feed directly the target; they actively look for the prey...

PARASITOIDS

... They develop, mainly in the larval stage, feeding inside the host species...

PATHOGENS

Beauveria bassiana (Hypocreales: Corducipitaceae)
Beauveria brongniartii (Hypocreales: Corducipitaceae)
Metarhizium brunneum (formally ***M. anisopliae***) (Hypocreales: Clavicipitaceae)

} *A. c.*, *A. g.*

Isaria farinosa (Hypocreales: Clavicipitaceae)
Nosema glabripennis (Dissociodihaplophasida: Nosematidae)

} *A. g.*

How?

- impregnating non-woven or polyurethane bands with conidia and then attaching the band onto trees;
- spraying conidia directly onto trees;
- mixing conidia in with a paste and applying this to trees

In China using bands impregnated with *B. brongniartii* to control *A. chinensis*, the mortality rate decreased from 84–100% to 55–73%if only half the trees were banded.

PATHOGENS **Nemathods**

Steinernema feltiae Filipjev (Rhabditida: Steinernematidae) — *A. c.*, *A. g.*
Steinernema carpocapsae Weiser (Rhabditida: Steinernematidae) (also known as *Neoaplectana carpocapsae*) — *A. c.*, *A. g.*
Priostonchus sp. (Rhabditida: Diplogastridae) — *A. c.*, *A. g.*

Steinernema bibionis Bovien (Rhabditida: Steinernematidae) — *A. g.*
Heterorhabditis marelatus Liu et Berry (Rhabditida: Heterorhabditidae) — *A. g.*
Heterorhabditis sp. (Rhabditida: Heterorhabditidae) — *A. g.*

How?

- spraying directly into larval tunnel (?!)

Sunlight has a deleterious effect on mortality rates

PATHOGENS **Bacteria**

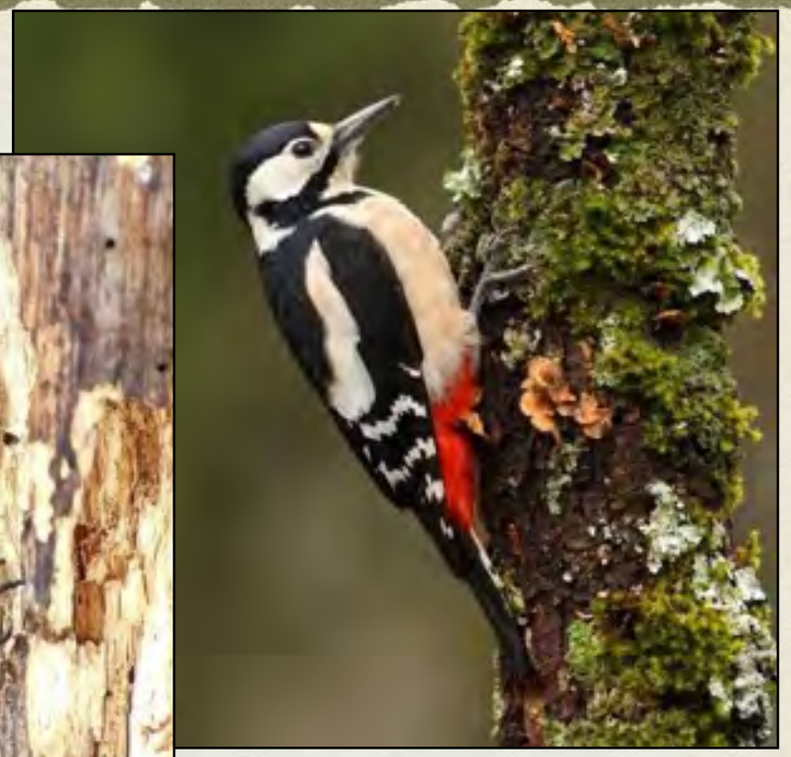
Bacillus thuringiensis Berliner var. *tenebrionis* (Bacillales: Bacillaceae).

Serratia marcescens (Enterobacteriales: Enterobacteriaceae).

With limited success.

PREDATORS

Dendrocopos major Beicki (Piciformis: Picidae)
Picus canus Gmelin (Piciformis: Picidae)



In China studies to assess the rate of predation of *A. glabripennis* by woodpeckers, the reduction in the beetle's population varied between 31 and 79%,

Oecophylla smaragdina Fabricius (Hymenoptera: Formicidae)

It has been shown that, in areas where it was present, insecticides were not required to control A. chinensis in orchards.

PARASITES

Dastarcus helophoroides Fairmaire (Coleoptera: Bothrideridae)

The best studied, which is a parasite of a number of longhorned beetle species, including both *A. glabripennis* in China and *A. chinensis* in Japan. Larvae can parasitise late-instar larvae and youngadults of *A. glabripennis*, and the adults have also been shown to predate on *A. glabripennis* larvae.

A release strategy is to place eggs at the entrance of A. glabripennis larval tunnels, which resulted in an 85–90% reduction in the *A. glabripennis* population - very labour intensive

Aprostocetus anoplophorae Delvare

IN LOMBARDY

... in February 2002...

A previously uncharacterised parasitoid of *A. chinensis*, *Aprostocetus anoplophorae* Delvare (Hymenoptera: Eulophidae), was identified in Italy in 2002.

Ann. Soc. entomol. Fr. (n.s.), 2004, 40 (3-4) : 227-233 — ARTICLE

Description of *Aprostocetus anoplophorae* n. sp. (Hymenoptera: Eulophidae), a new egg parasitoid of the invasive pest *Anoplophora chinensis* (Förster) (Coleoptera : Cerambycidae)

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Abstract – *Aprostocetus anoplophorae* n. sp. (Hymenoptera: Eulophidae) is supposed to play a role as an egg parasitoid of the invasive pest, the Citrus Longhorned Beetle, *Anoplophora chinensis* (Förster). The studies of its morphology, and rDNA sequence data, strongly indicate that this taxon differs greatly from all described *Aprostocetus* species, and is new to science. This species is described and illustrated. Both its systematic placement and origin are discussed.

Résumé – **Description de *Aprostocetus anoplophorae* n. sp. (Hymenoptera, Eulophidae), un nouveau parasite de l'espèce invasive *Anoplophora chinensis* (Förster) (Coleoptera, Cerambycidae).** – *Aprostocetus anoplophorae* n. sp. (Hymenoptera : Eulophidae) est supposée jouer un rôle comme parasite des œufs de l'espèce de Cerambycidae invasive *Anoplophora chinensis* (Förster). L'étude morphologique et les séquences ADNr indiquent fortement que ce taxon est très différent des autres espèces décrites d'*Aprostocetus* et est nouvelle pour la science. Elle est décrite et illustrée. Sa position systématique et son origine sont discutées.

Two longhorned beetles *Anoplophora glabripennis* (Motschulsky), and *Anoplophora chinensis* (Förster)

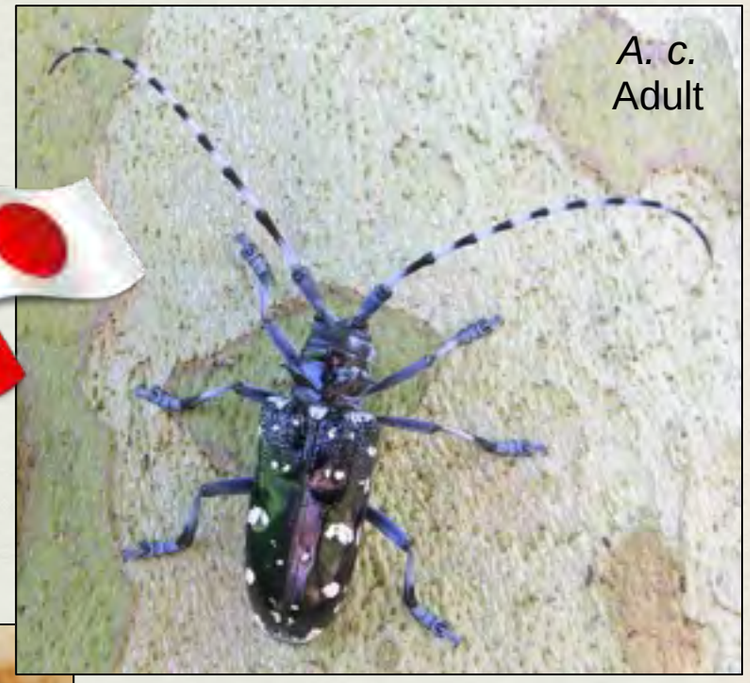
ery where bonsais imported from Eastern Asia were grown. In 2003, *A. chinensis* was detected at Soyons, France, and hence was considered as an invasive pest

PARASSITOIDS

Aprostocetus anoplophorae Delvare
(Hymenoptera: Eulophidae)

A. a. Adult

A. a. larvae inside an *A. c.* egg



A. c. Adult

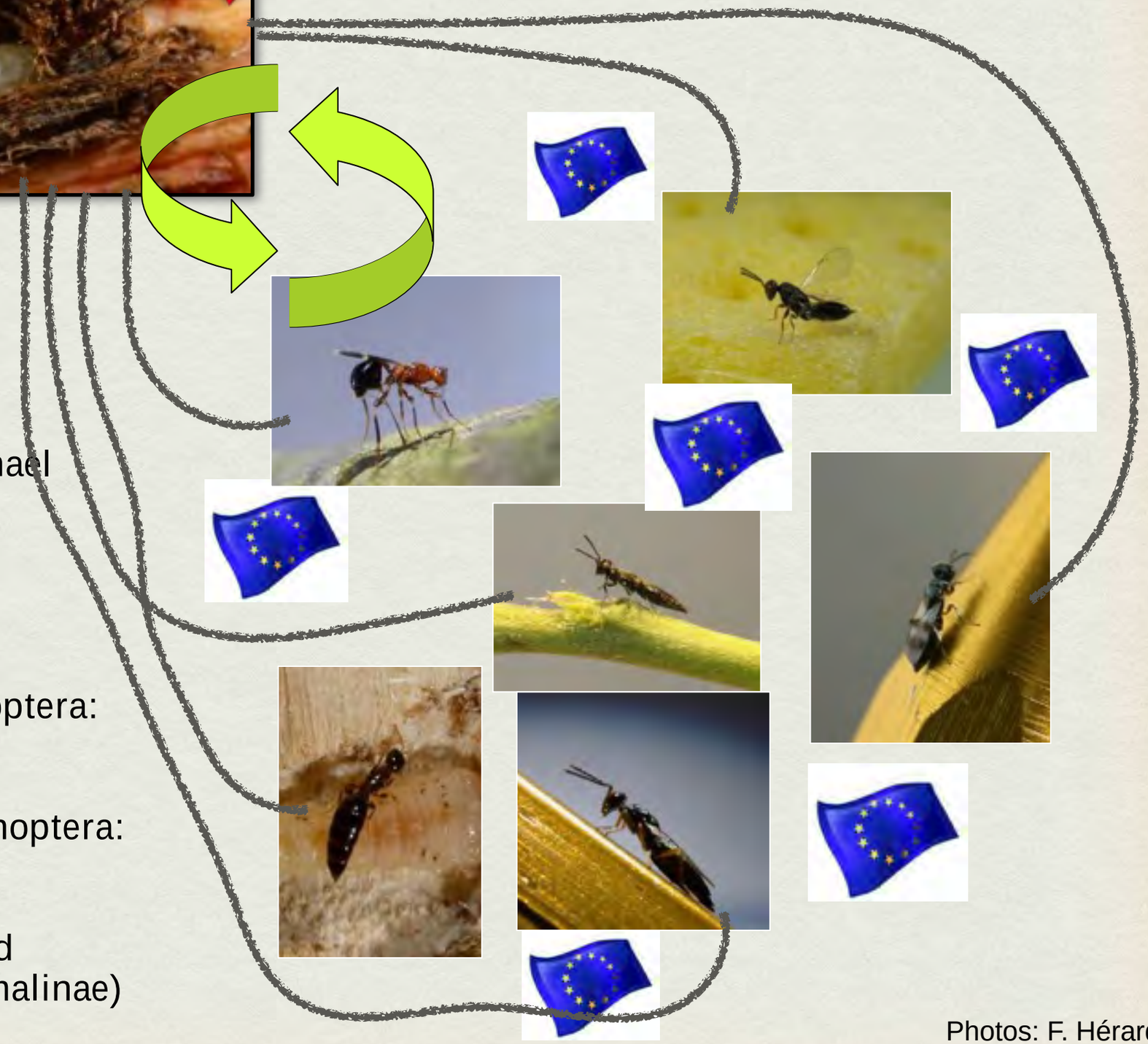
A. c. Egg

- Hym.: Eulophidae
- Likely native to Eastern Asia, imported to Italy in CLB infested host plants and now naturalized in Parabiago area
- Egg parasitoid, gregarious
- Strictly specific to *A. chinensis*
- 2-3 generations/year, cycle synchronized with CLB
- High rate of parasitization in natural conditions (21% -72%)
- Currently: the best candidate for biological control of CLB

European larval parasitoids of *A. chinensis*

<u>New association</u>

Exotic pest – Indigenous parasitoids



Spathius erythrocephalus Wesmael (Hymenoptera: Braconidae)

Eurytoma melanoneura Walker (Hymenoptera: Eurytomidae)

Calosota vernalis Curtis (Hymenoptera: Eupelmidae)

Cleonymus brevis Boucek (Hymenoptera: Pteromalidae, Cleonyminae)

Trigonoderus princeps Westwood (Hymenoptera: Pteromalidae, Pteromalinae)

Sclerodermus sp. (Hymenoptera: Bethylidae)

Photos: F. Hérard

Attract & Kill technique using Sentinel trees

The sentinel trees method is based on the use of highly attractive tree species for an attract and kill purpose, to monitor pest presence and suppress its populations in areas where infestations are developing, or in sites that previously harboured pest populations. The attract and kill technique is particularly suitable for areas that are difficult to monitor.

Sentinel trees

Aerial view of the site at Montichiari (BS) where a row of sentinel trees was planted

The primary objective will be to attract beetles and kill them by spraying an insecticide on the trunk (*Lambdacialotrina*). The killing agent would simply be applied to the lower 50cm of the trunk where adult CLB lay eggs. The objective would be to kill beetles prior to oviposition. Killing beetles that are attracted to and land on the sentinel trees gives this strategy its name, Attract-and-Kill.

Federal Research & Training Centre for Forests, Natural Hazards & Landscape
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Department of Forest Protection,
Federal Research and Training
Centre for Forests, Natural
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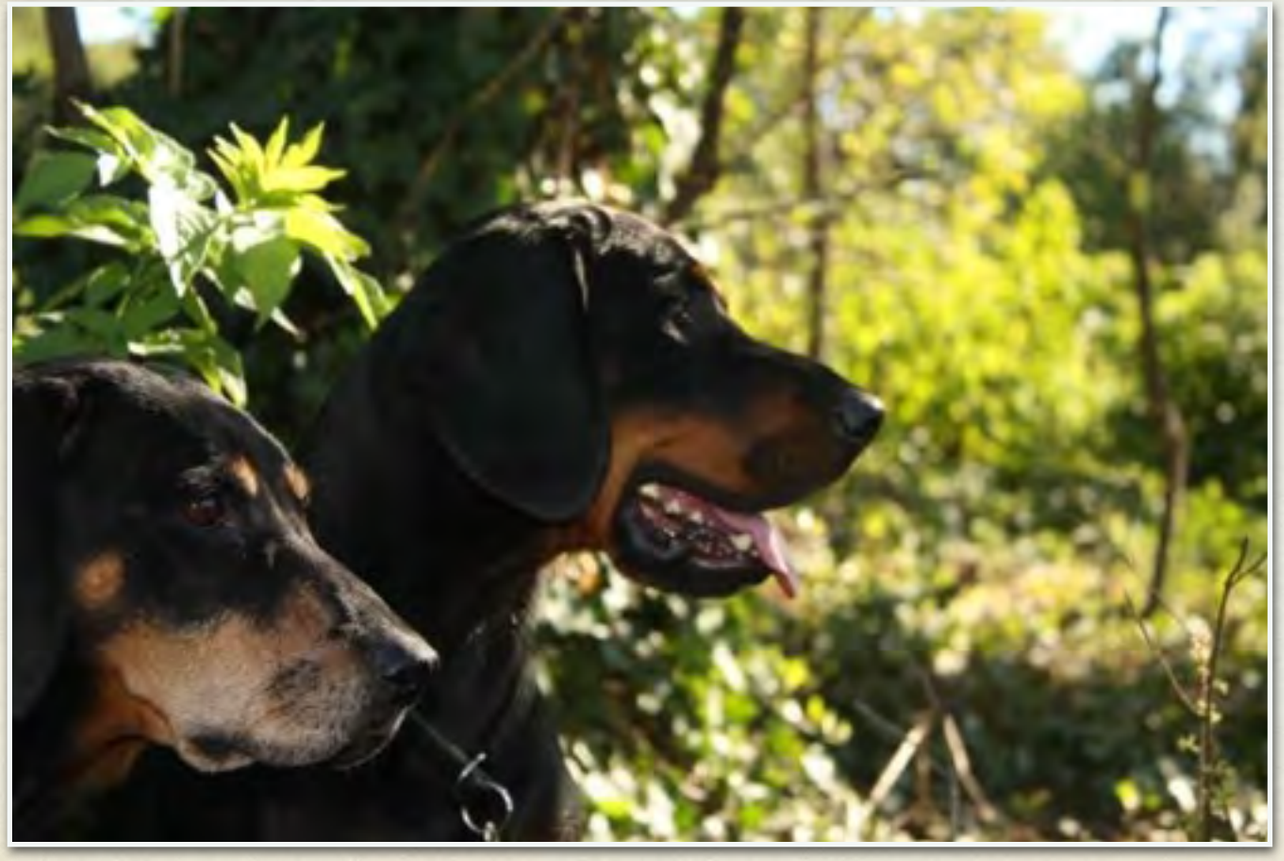
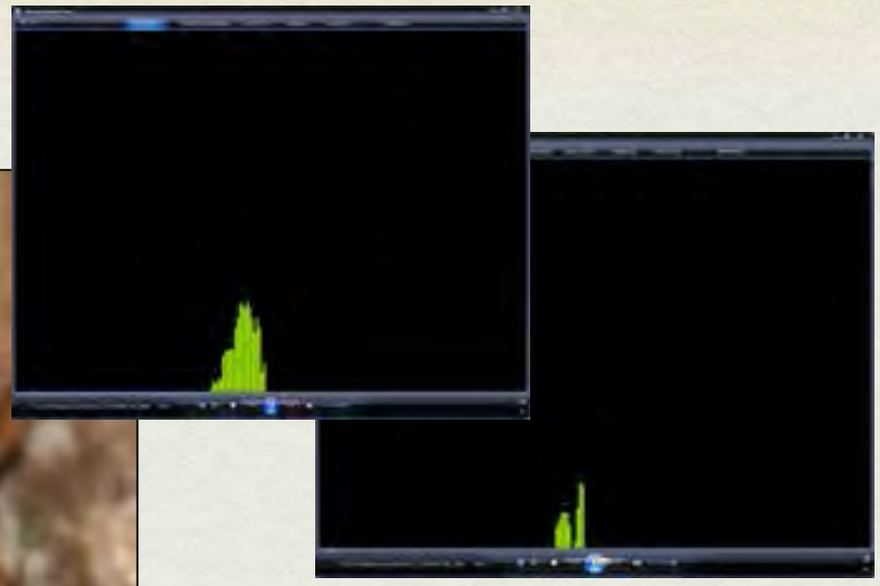
Austria



In the picture: Andor and Ute Hoyer-Tomiczek

The Sound Detector



SCHERTLER®

Use of Semiochemical - baited traps

Multi Funnel Traps

Cross Vane Panel Traps

The identification of potentially attractive semiochemicals should be informed by an understanding of the ecology and natural history of the beetle. ALB has been described as a somewhat sedentary species, which often re-infests the same host tree until it is exhausted as a resource (Williams et al. 2004).

Mate finding and copulation appear to involve a complex series of behaviors, including responses to chemical and visual cues. Males produce a volatile pheromone (Zhang et al. 2002) that, when perceived in combination with certain plant-derived volatile compounds, attracts primarily virgin females (Nehme et al. 2010). Once males and females are in close proximity, mate finding appears to include additional visual and chemical cues, including a female-produced sex trail pheromone (laid down by the female as she walks across the host) that is attractive only to males (Hoover et al. 2014) and a female-produced contact pheromone that stimulates males to initiate mating (Zhang et al. 2003).

In earlier field studies conducted in China, Nehme et al. (2010) reported that a mixture of the plant volatiles linalool, linalool oxide, *cis*-3-hexen-1-ol, *trans*-pinocarveol and *trans*- caryophyllene, presented in combination with the male pheromone— a 1:1 mixture of 4-(*n*- heptyloxy)butan-1-ol and 4-(*n*-heptyloxy)butanal — significantly increased trap catches of females, of which 85% were found to be virgins.


Photo *Matteo Maspero*
Thank you…!