ORGANISATION EUROPEENNE ET MEDITERRANEENNE POUR LA PROTECTION DES PLANTES

EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION

Newsletter

of the EPPO Network of experts working on surveillance, monitoring, and control of the Emerald ash borer, *Agrilus planipennis*

NO. 10

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Contents of the Newsletter

The webpage of the Network:
https://www.eppo.int/RESOURCES/special_projects/agrilus_planipennis_network

Photo of *Agrilus planipennis* above (Courtesy: E. Jendek).

Introduction

We are pleased to welcome readers to the 10th issue of the Newsletter of the EPPO Network of experts working on the surveillance, monitoring, and control of the Emerald ash borer, *Agrilus planipennis*. The Network was established by **the European and Mediterranean Plant Protection Organization (EPPO)** following a recommendation of its **Panel on Quarantine Pests for Forestry**. It was created in association with an EPPO-EU project **FORSAID** and is supported by funding from the **European Union's Horizon Europe Research and Innovation Programme** under grant agreement No. 101134200, *FORSAID: Forest surveillance with artificial intelligence and digital technologies*. As of July 2026, the Network brings together **more than 330 members from over 45 countries**, reflecting strong and growing international collaboration. We warmly encourage readers to invite colleagues to join the Network via the following link.

The **EPPO Secretariat** invites participants to share relevant information, updates and calls with the Network Coordinator (Dmitrii Musolin, dm@eppo.int).

EPPO FAO-REUFIS BFW Conference 'Safeguarding Forests in Europe: Emerging Risks of *Agrilus* Wood Borers (Buprestidae)'

A conference 'Safeguarding Forests in Europe: Emerging Risks of *Agrilus* Wood Borers (Buprestidae)' was co-organized by the European and Mediterranean Plant Protection Organization (EPPO), the Forest Invasive Species Network for Europe and Central Asia (REUFIS) of the Food and Agricultural Organization of the United Nations (FAO), and the Austrian Research Centre for Forests (BFW). It was supported by the EPPO Network of

experts working on surveillance, monitoring, and control of the Emerald ash borer, *Agrilus planipennis* and the Project FORSAID and was hosted by BFW in Vienna on 21—23 April 2026.

Figure 1. Conference participants (Courtesy: F. Winter, BFW).

The meeting was attended in person by more than 60 participants from 25 countries, including experts from the European Commission, the European Food Safety Authority (EFSA), REUFIS, FAO, the European Union Reference Laboratory (EURL) for Insects and Mites, National Plant Protection Organizations (NPPOs) of several countries of the EPPO region and other countries, plant health scientists, policy officials, quarantine experts, pest control specialists, academia professionals and post-graduate students (Fig. 1). In addition, more than 70 participants from around the world joined the meeting online.

Figure 2. Some of the presenters (Courtesy: F. Winter, BFW).

The scope of the meeting focused on the growing threats posed by tree-killing buprestids to Europe's forests (Fig. 3), with a particular emphasis on:

- the Emerald ash borer (*Agrilus planipennis*), native to South-East Asia and already causing devastating losses in North America, European Russia, and Ukraine;
- the Bronze birch borer (*Agrilus anxius*) and the Two-lined chestnut borer (*Agrilus bilineatus*), both originating from North America and posing significant risks to European ecosystems.

Figure 3. *Agrilus planipennis* (2 specimens), *A. anxius*, *A. roscidus*, *A. sulcicollis*, and *A. graminis* (Courtesy: A.V. Petrov [Institute of Forest, RU; the left photo] and J. Connell [BFW; other photos]).

This was the second international conference focusing on *Agrilus* wood borers organized in Vienna. The first conference, entitled 'Preparing Europe for Invasion by the Beetles Emerald Ash Borer and Bronze Birch Borer', was held in 2018. The 2026 meeting therefore provided an opportunity to review developments since the first conference, discuss the knowledge accumulated over recent years, and assess how preparedness and response capacities have progressed across countries.

The programme of the conference was highly diverse and dynamic and included 5 keynote lectures, 33 talks, 13 posters, and group work (Figures 2, 4, 5).

Presentations covered a broad range of topics related to surveillance for *Agrilus* beetles, their biology, detection, identification, phytosanitary treatments, preparedness of countries to arrival of the Emerald ash borer and other *Agrilus* pests, risk assessment, pathways of introduction and spread, as well as management and communication challenges.

The organizers warmly thank all attendees for their active participation during the conference.

The abstract book of the conference can be downloaded here.

Most presentations are available as pdf files and/or video recordings at the webpage of the conference.

The organizers of the conference plan to publish selected papers from the meeting in the *EPPO Bulletin*, both in an ordinary issue and in a special virtual collection devoted to emerging risks of *Agrilus* wood borers. All presenters (but, in fact, all interested) are invited to submit manuscripts following the standard submission procedure:

https://submission.wiley.com/journal/EPP. Manuscripts may include standard research papers, (mini-)reviews, short notes, or descriptions of good practices—anything that may be of interest to NPPOs. Accepted papers will be published in **regular issues** of the journal and, immediately upon acceptance, will also become part of a special **virtual collection** of the ***EPPO Bulletin*** devoted to **emerging risks of *Agrilus* wood borers**. Publication in the ***EPPO Bulletin*** is free of charge. This virtual collection will also include papers, Diagnostic protocols, Standards, datasheets, etc., related to different *Agrilus* species and previously published in the ***EPPO Bulletin*. Manuscripts** for this special *Agrilus* collection can be submitted until **31st December 2026.**

Figure 4. Discussions during a break (Courtesy: F. Winter, BFW).

Figure 5. Group work (Courtesy: F. Winter, BFW).

Read more:

Musolin D., Lakatos F., Hoch G. (eds.). Safeguarding forests in Europe: Emerging risks of *Agrilus* wood borers (Buprestidae). EPPO, FAO-REUFIS and BFW conference (21—23 April 2026, Vienna): Programme and Abstracts. 2026. 60 p. https://www.eppo.int/media/uploaded_images/MEETINGS/Meetings_2026/Agrilus%20Conf%202026%20Programme%20and%20Abstracts%20fv.pdf

First record of *Agrilus planipennis* in the European Union: Hungary

Given the westward spread of *Agrilus planipennis*, its arrival within the EU was expected. To facilitate early detection within Hungary, we deployed Csalomon© MULTz (25 traps at 7 locations; 2—4 traps per location; ca. 100 m apart) in ash stands in the north-eastern part of Hungary, near the border with Ukraine, in May 2026 (Figures 1 and 2).

On June 9, 2026, a beetle that was suspected to be *A. planipennis* was found in a colour trap set up in a forest area (Fig. 1, site marked with a red spot) in Beregsurány. Based on high-resolution macrophotographs of the beetle, Eduard Jendek (a recognized expert on *Agrilus*) identified the specimen as *A. planipennis* (Fig. 3). We sent a sample to the NPPO of Hungary for PCR-based testing. This confirmed that the beetle is indeed the Emerald ash borer.

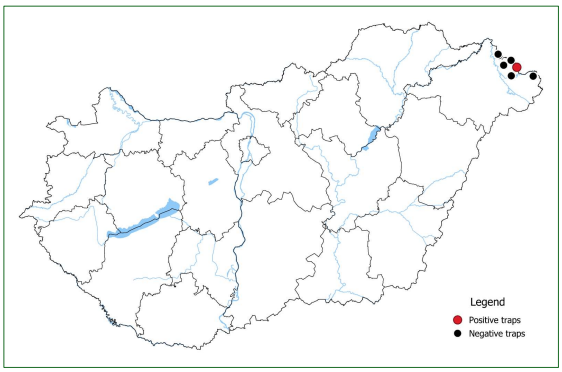


Figure 1. Locations of the traps for *Agrilus planipennis*. Note that two northmost locations of negative traps are very close to each other, so they appear as one circle on the map.

Figure 2. The trap in which the first specimen of *Agrilus planipennis* was caught.

During the inspection on June 24, 2026, **another *A. planipennis* adult was found** in the same trap. Incidentally, we saw bark gouges on the trunk, which are likely to have been caused by woodpeckers searching for pupae inside the bark (Fig. 4). We also found similar marks on the trunk next to the tree holding the trap, as well as on another trunk approximately 150 m away, suggesting that the infestation is not limited to a single tree.

By increasing the number of traps, information on the spread of the species will be collected. Preventive measures will also be necessary to stop or slow its spread. In cooperation with the Directorate of Plant Protection of the National Food Chain Safety Office, the Forest Protection Department of Forest Research Institute of the University of Sopron is also doing everything in its power to ensure that our ash trees, already threatened by other pests and diseases, suffer as little as possible from the damage caused by this beautiful but extremely harmful invasive species.

Figure 3. The first specimen of *Agrilus planipennis* caught in Beregsurány.

Figure 4. Bark gouges visible on the trunk of ash trees in Beregsurány.

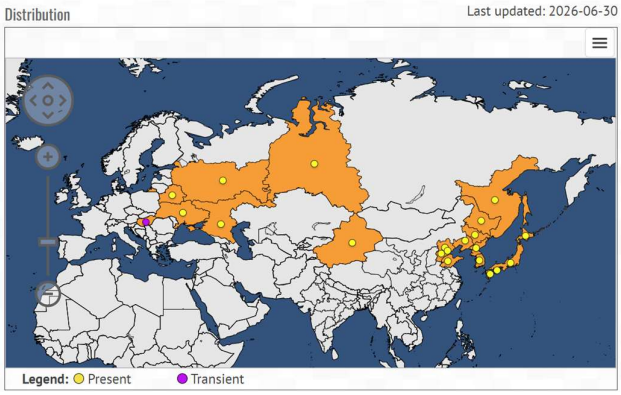
(prepared by **György Csóka**, Forest Research Institute, University of Sopron, and **Sándor Bogya**, National Food Chain Safety Office, Directorate of Plant Protection, Hungary)

A note from the EPPO Secretariat:

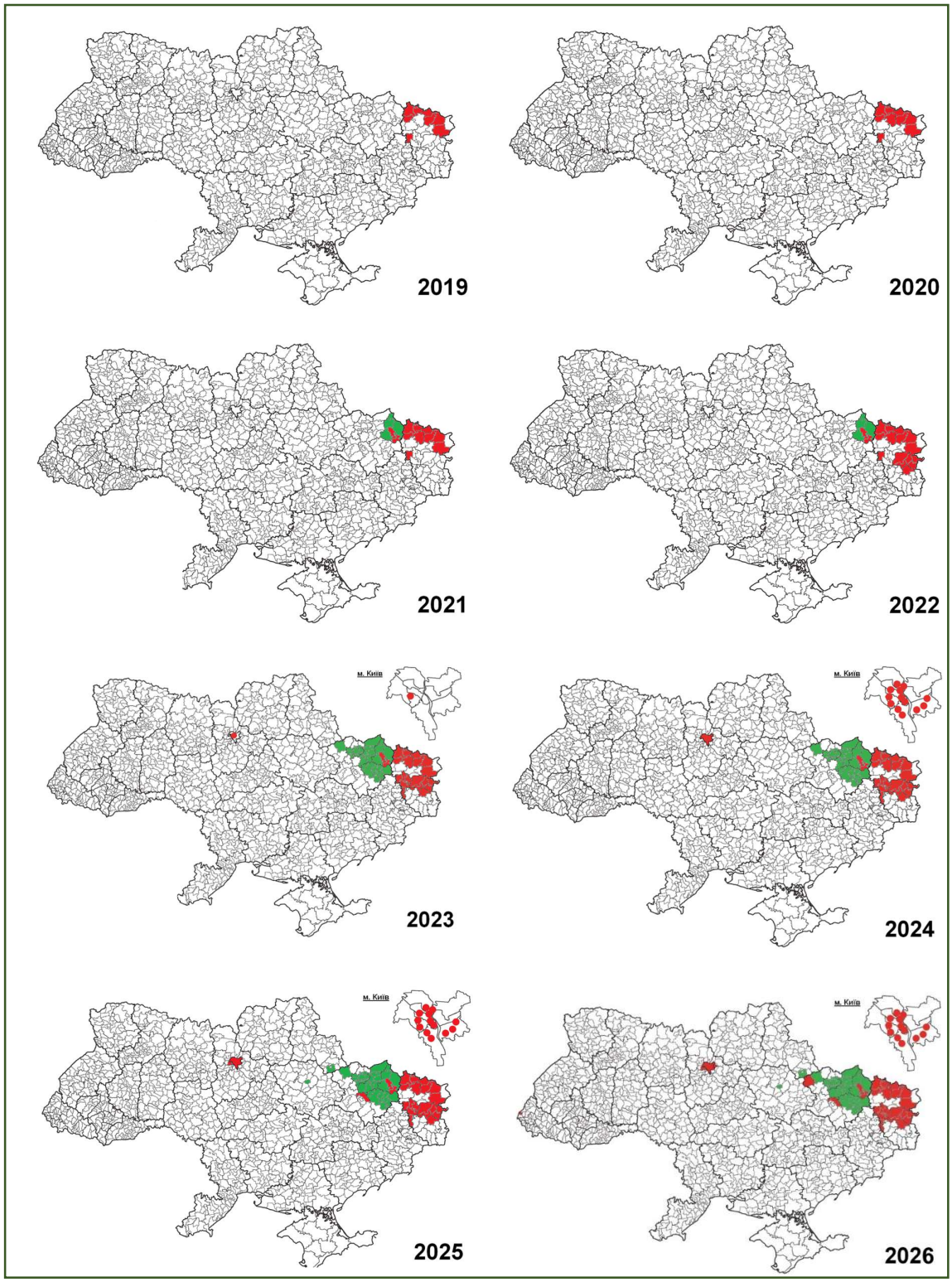
In June 2026, **the NPPO of Hungary** informed the EPPO Secretariat that one adult of *A. planipennis* was found in a trap close to the border with Ukraine. **The pest status of *A. planipennis* in Hungary** is officially declared as: Transient, actionable, under surveillance.

Source: NPPO of Hungary (2026-06); EPPO RS 2026/137.

The current distribution of ***A. planipennis*** **in the EPPO Global Database:**



Distribution of *Agrilus planipennis* in Ukraine: an update for 2026



The dynamics of the invasive range of *Agrilus planipennis* in Ukraine in 2019—2026 (07). Red — zones confirmed by the NPPO of Ukraine; green — zones of potential presence (local reports not confirmed by the NPPO (courtesy: 'Kharkivlisozakhist'. https://www.kharkivlisozahyst.gov.ua/diyalnist/monitorynh/; accessed on 10 July 2026).

In July 2026, the Ukrainian State Specialized Forest Protection Enterprise DS LP 'Kharkivlisozakhist' updated a dynamic map showing the change of the range of the Emerald ash borer in Ukraine in 2019 – 2026 (https://www.kharkivlisozahyst.gov.ua/diyalnist/monitorynh/; note also the new address of the map). The map (see the previous page) shows not only districts where the presence of the pest is confirmed by the NPPO, but also districts with local reports that are not yet confirmed by the NPPO.

EPPO dynamic map of spread of *Agrilus planipennis* will soon be available for NPPOs of EPPO member countries

In 2025, EPPO initiated development of an internal tool (DynaMaps), to prepare interactive dynamic maps to visualize the presence of a pest in particular region and for particular years. This tool will be continuously updated as new data become available, helping countries respond rapidly, share information, and improve preparedness, particularly in areas close to the current pest range. In future, other information can be added to the dynamic map (e.g. data on absence of the pest based on data from traps). A pilot version showing spread of *A. planipennis* over the years has been developed using this tool (Fig. 1).

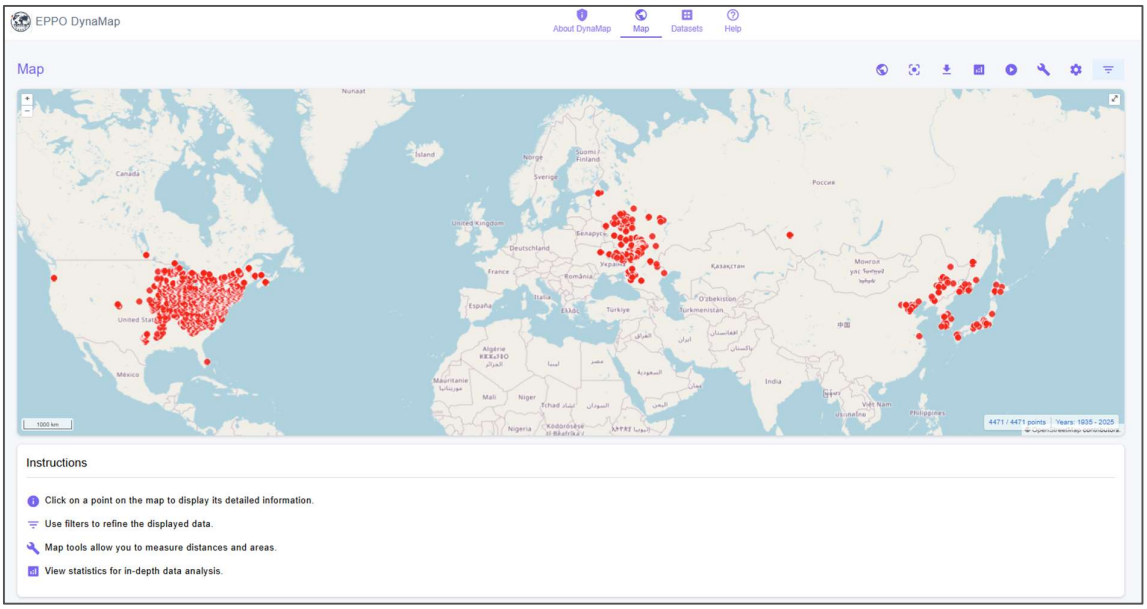


Figure 1. Records of *Agrilus planipennis*. Print screen of pilot version of the dynamic map.

A group of experts from the EPPO Panel on Quarantine Pests for Forestry and the Network was established in 2025. Experts collect and review old publications and monitor newly published information. They verify records of presence of *A. planipennis* in each publication based on their expert knowledge. Then they prepare datasets to be used in the dynamic map. Suspicious records are not used for preparation of the datasets.

Each record includes the following information (most of it will be visible for users in a data card associated with each record point):

- year of the record,
- GPS coordinates (not visible for users),

- record from a host plant or a trap,
- name of the host (genus/species, if known),
- status (for traps: present/absent; to be added in future),
- type of reference source (an NPPO report; scientific publication such as peer-reviewed paper, conference abstract, scientific report; citizen science data such as online databases, etc.),
- full reference of the publication,
- comment (optional and can contain additional information associated with the record, e.g. in the case of traps — type of trap used — with a lure, coloured traps, using stressed/dying trees),
- validated/not-validated by the NPPO.

Validation of pest distribution data by the NPPO concerned is important for all EPPO member countries and up-to-date pest distribution data allow NPPOs to take necessary actions in a timely manner. EPPO understands the sensitivity of pest distribution information but also the importance of sharing essential data with its member countries. Therefore, in June 2026 **the EPPO Working Party on Phytosanitary Regulations decided that for now access to non-validated records in the dynamic map will be restricted to the NPPOs of EPPO member countries**. In future, the Working Party may reconsider access possibilities for the dynamic map.

In July 2026, NPPOs of EPPO countries where *A. planipennis* has been recorded were asked to validate prepared datasets. When this data has been entered into the dynamic map, NPPOs of all EPPO member countries will be informed and given access to the map.

Surveys for the Emerald ash borer in Bulgaria

Host plants in Bulgaria. The territory of Bulgaria is 111 000 km^2, and forests occupy approximately 37.7% of the territory. Ash is present in the mixed broad leaf forests (19 420 ha), forest protective belts (2300 ha; pure and mixed ash stands, mainly in Northern Bulgaria) and wetlands (together with alder). European ash (*Fraxinus excelsior*), manna ash (*F. ornus*) and narrow-leaved ash (*F. angustifolia*) are found in forests in Bulgaria. *Fraxinus nigra* and *F. pennsylvanica* are predominant ash species in urban areas, roadsides, parks, gardens, etc. *Fraxinus pennsylvanica* and *F. excelsior* are more prone to be infested by *Agrilus planipennis* (Selikhovkin et al., 2022).

Risk factors for ash trees in Bulgaria. In many regions of the country, trees are weakened and stressed. An assessment performed in 2022 demonstrated that 22% of forest protective belts with ash are in poor condition, with 44% in satisfactory condition, and only 34% in good condition (Mateva & Kirilova, 2022). There is considerable movement of vehicles from Ukraine which travel across the BCP Danube Bridge or by ferry.

Specific surveys for *A. planipennis* have been conducted by the NPPO of Bulgaria (the Bulgarian Food Safety Agency, BFSA) since 2014 in sites with host plants of the pest near high risk locations, such as ports, ash trees in parks, forest protective belts in poor health. Host plants were visually inspected for signs of *A. planipennis* infestation during inspections at nurseries, garden centres, roadsides, etc.

In 2014—2024: visual inspections were organized over the whole territory of the country; no positive findings were recorded.

In 2025: visual inspections (34 survey sites, 54 visual examinations), trapping (green sticky traps with (3Z)-hexenol), 17 trapping sites, 17 traps. No positive findings were reported.

In 2026: visual inspections by the Regional directory for Food Safety (RDFS) are ongoing: in May to October, trapping using sticky and multifunnel traps with (3Z)-hexenol as an attractant in June to September (a typical flight period of *A. planipennis*) 22 traps in 22 sites (Figures 1 and 2). The traps are inspected every 2 weeks.

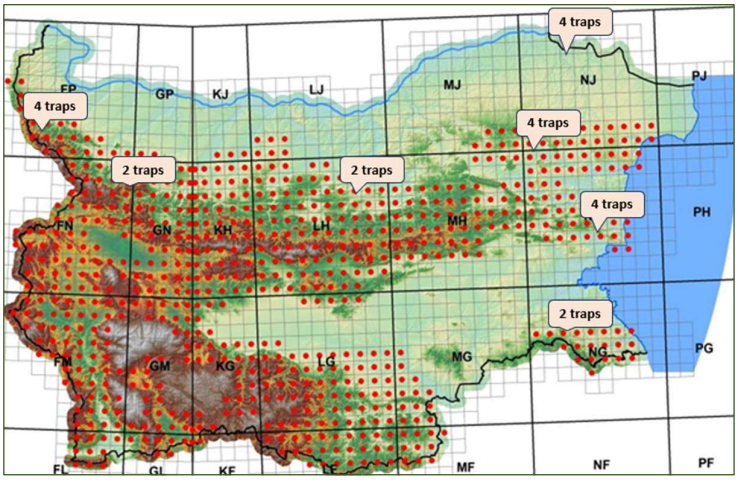


Figure 1. Distribution of riparian forests of alder (*Alnus* spp.) and European ash (*Fraxinus excelsior*) (red dots; source) and locations of traps installed to detect *Agrilus planipennis* in Bulgaria in 2026.

Figure 2. A green UV-resistant plastic 12-funnel trap used since 2026 in the surveys (Courtesy: G. Gospodinov, RDFS, Dobrich).

Figure 3. A handout leaflet prepared by CLPQ.

Figure 4. An event organized by BFSA in a school in Sofia in 2025 (#PlantHealt4Life; Courtesy: Press Centre of BFSA).

This work is challenging because additional equipment is needed to set up traps high in canopy, there is lack of data on ash distribution in urban areas, and samples from the trunks and branches are difficult to take.

A contingency plan for *A. planipennis and A. anxius* for Bulgaria was published in 2024.

Identification and confirmation of suspect *A. planipennis* specimens is carried out at the Central Laboratory for Plant Quarantine (CLPQ) in Sofia.

Raising public awareness is done via campaigns (press releases, meetings with professional operators, citizens, students), leaflet, etc. (Figures 3 and 4).

References

Mateva P, Kirilova M (2022) Condition of the protective forest belts in Dobrudja. Gora 8: 12—14 (In Bulgarian).
https://www.researchgate.net/publication/368476679_Sstoanie_na_zasitnitegorski_poasi_v_Dobrudza_Forest_shelterbelts_in_North-Eastern_Bulgaria_-_condition_in_2022_year_In_Bulgarian

Selikhovkin AV, Musolin DL, Popovichev BG, Merkuryev SA, Volkovitsh MG, Vasaitis R (2022) Invasive populations of the Emerald ash borer Agrilus planipennis Fairmaire, 1888 (Coleoptera: Buprestidae) in Saint Petersburg, Russia: A hitchhiker? *Insects*. 2022; 13(2):191. https://doi.org/10.3390/insects13020191v

(prepared by **Sofiya Stamenova**, CLPQ, Bulgarian Food Safety Agency, Sofia, Bulgaria)

Novel CytB-based real-time PCR test for early detection of *Agrilus planipennis*

A recent study developed **a new species-specific real-time PCR test** targeting the mitochondrial cytochrome B (CytB) gene of *A. planipennis* and using a Locked Nucleic Acid (LNA) probe.

The detection limit of this method was 25.6 fg/µL for adult DNA extracts and 0.21 pg/µL for frass produced by *A. planipennis* larvae. **The new test, which targets a different genetic locus**, not only **allows identification of the pest and provides an indirect diagnosis through environmental DNA analysis** but can also be used for cross-validation of results between different tests.

Read more:

Rizzo D, Pecori F, Gionni A. et al. (2006) Novel *Agrilus planipennis* (Coleoptera: Buprestidae) early-detection tool designed on cytochrome B gene. *J Plant Dis Prot* 133, 101. https://doi.org/10.1007/s41348-026-01286-3

Changes made to the EU list of regulated pests

The EU list of regulated pests included in the Annexes II to IV of Implementing Regulation (EU) 2019/2072 has recently been modified and published in the Commission Implementing Regulation (EU) 2026/826.

Of particular relevance to readers of this newsletter, the following species was added to the **Annex II A (Union Quarantine pests, not known to occur in the Union territory)**:

— *Agrilus bilineatus*.

Figure 1. Adult of *Agrilus bilineatus*, USA (Courtesy: E. Jendek).

Figure 2. Larval galleries of *Agrilus bilineatus* on *Quercus ellipsoidalis* (Minnesota, USA; (Courtesy: S.A. Katovich, USDA Forest Service).

Reference

EPPO Reporting Service no. 05-2026. Num. article: 2026/115. https://gd.eppo.int/reporting/article-8411

EU (2026) Commission Implementing Regulation (EU) 2026/826 of 14 April 2026 amending Implementing Regulation (EU) 2019/2072 as regards the listing of pests and rules on the introduction into, and movement within, the Union territory of plants, plant products and other objects. *Official Journal of the European Union* OJ L, 2026/826. *ELI:* http://data.europa.eu/eli/reg_impl/2026/826/oj

EFSA published survey parameters to support detection survey design for *Agrilus planipennis* and *A. anxius*

Since 2025, EFSA has conducted expert knowledge elicitations to estimate survey parameters for the detection of EU priority pests listed in Commission Delegated Regulation (EU) 2019/1702, in cases where pest-specific information is lacking in the scientific literature. The design and implementation of statistically sound and risk-based surveys require quantitative parameters such as sampling effectiveness, design prevalence and relative risk. A recently published reports present the estimated values for *Agrilus planipennis* and *A. anxius*, together with the supporting evidence and expert rationale. These values will be integrated into the EFSA Plant Pest Survey Toolkit to support EU Member States in designing harmonised pest surveys across the EU.

EFSA (European Food Safety Authority), Nougadère A, Parnell S, Rzepecka D, Papadogiorgou GD, Bali EMD, Rodovitis VG, Papadopoulos NT, Kaluski T and Vos S (2026) Survey parameters to support detection survey design for *Agrilus anxius*. EFSA supporting publication 2026:EN-10145. 38 pp. https://doi.org/10.2903/sp.efsa.2026.EN-10145

EFSA (European Food Safety Authority), Nougadère A, Parnell S, Rzepecka D, Papadogiorgou GD, Bali EMD, Rodovitis VG, Papadopoulos NT, Kaluski T and Vos S (2026) Survey parameters to support detection survey design for *Agrilus planipennis*. EFSA supporting publication 2026:EN-10141. 40 pp. https://doi.org/10.2903/sp.efsa.2026.EN-10141

Austria updated its contingency plan for *Agrilus planipennis*

In 2025, Austria updated its contingency plan for *Agrilus planipennis*.

The document outlines Austria's emergency response plan for *Agrilus planipennis*, including legal frameworks, detection methods, and containment measures. It emphasizes early

detection via visual surveys, traps, and using sniffer dogs, establishing and adjusting restricted zones, and implementing destruction and quarantine protocols. Coordination among authorities, public awareness, and risk-based surveys are key to preventing establishment and spread.

Lists of other country contingency plans for *A. planipennis* were published in Newsletter issues 7, 8, and 9. Please let us know if your countries plans have been published or updated.

Spathius polonicus, a parasitoid of the Emerald ash borer, is reported in France

One specimen of *Spathius polonicus* Niezabitowski, 1910 (Hymenoptera: Braconidae Doryctinae) was officially identified by ANSES in a sample collected **near Avignon (France).** The parasitoid was reared from an *Agrilus* larva (very probably *A. sinuatus*, but possibly *A. roscidus*) extracted from the bark of a pear tree. The species was identified morphologically by Pascal Rousse (ANSES-EURL), and the identity was confirmed by barcoding, which showed a 100 % match with a specimen collected in 2021 near London (BOLD:AFJ9221, identification Gavin Broad, NHM London).

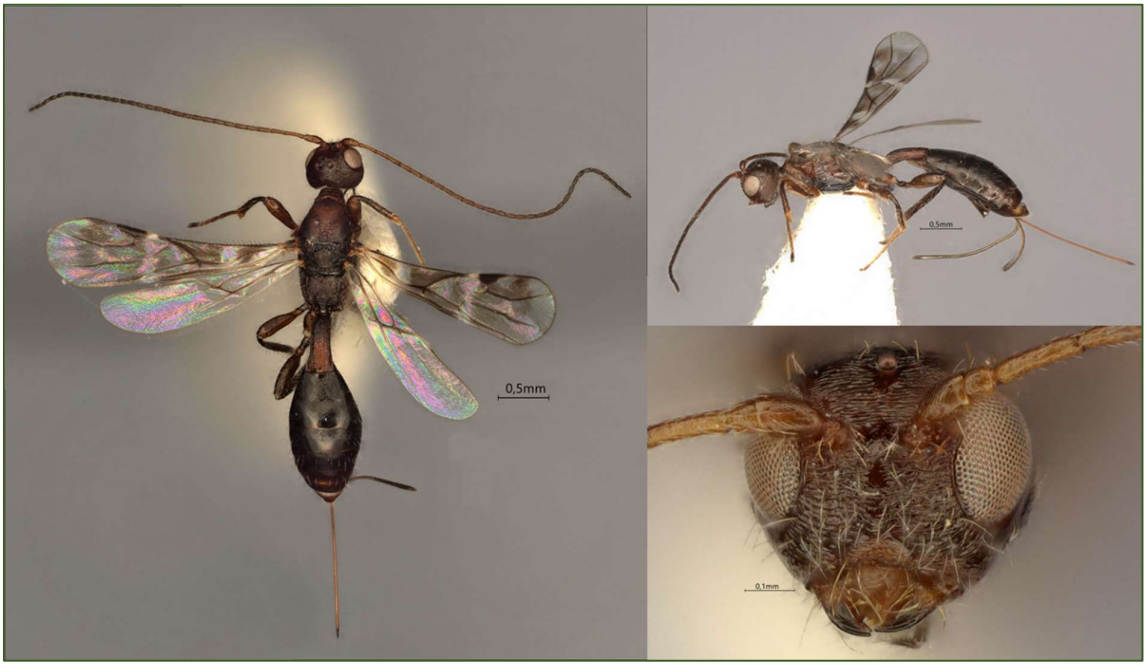


Figure 1. *Spathius polonicus* female. Left: habitus, dorsal view; top right: habitus, profile; bottom right: face (Courtesy: P. Rousse, ANSES-EURL).

Spathius polonicus (Fig. 1) is an ectoparasitoid of mainly buprestid larvae, including four *Agrilus* spp. (Yu et al., 2016). Orlova-Bienkoskaja and Belokobylskij (2014) reported *S. polonicus* on *A. planipennis* by collecting larvae under the bark of attacked *Fraxinus pennsylvanica* near Moscow which was the first case of parasitism of *A. planipennis* by an indigenous parasitoid in geographical Europe. Moreover, this report detailed very high field parasitism rates that let to suggest a significant effect on the pest population.

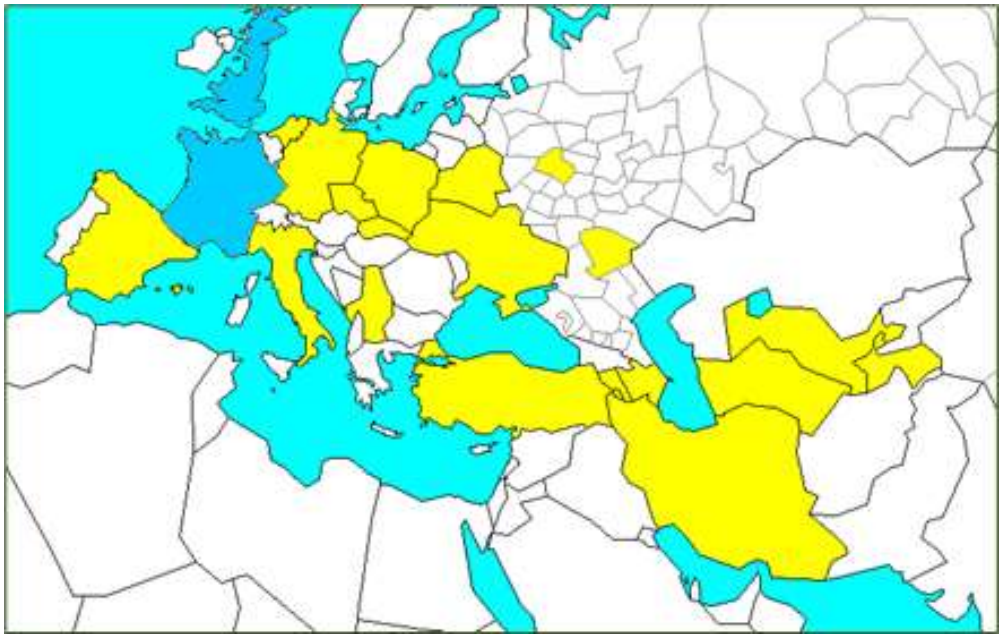


Figure 2. Currently known distribution of *Spathius polonicus*. The countries in yellow are listed in the Taxapad database (Yu et al., 2016), updated with the latest reports in the United Kingdom and France (blue).

Spathius polonicus is therefore considered as a potentially efficient agent of conservation biological control that could be used to limit the spread of *A. planipennis* from Russia towards central and Western Europe. Unfortunately, there is limited information on the biology and distribution of this parasitoid. For example, neither *A. sinuatus* nor *A. roscidus* were considered to be potential hosts prior to the current report. The parasitoid has been reported from Spain to Central Asia (Fig. 2), hence it is not unexpected to confirm its presence in France. However, it should be noted that it has rarely been collected in this wide area (Orlova-Bienkowskaja & Belokobylskij, 2014).

The full record of this finding will be published soon and a new sequence produced will be uploaded on the genetic databases to help future identifications in the EPPO area.

References:

Orlova-Bienkowskaja MJ, Belokobylskij SA (2014) Discovery of the first European parasitoid of the emerald ash borer *Agrilus planipennis* (Coleoptera: Buprestidae). *European Journal of Entomology* 111: 594–596. DOI: 10.14411/eje.2014.061. https://www.eje.cz/artkey/eje-201404-0020_Discovery_of_the_first_European_parasitoid_of_the_emerald_ash_borer_Agrilus_planipennis_Coleoptera_Buprestida.php

Yu DSK, van Achterberg C, Horstmann K (2016) Taxapad 2016, Ichneumonoidea 2015. Database on flash-drive. Nepean, Ontario, Canada.

(prepared by **Pascal Rousse**, ANSES-EURL)

Request for collaboration on parasitoids of *Agrilus* spp. in Europe

In Western Russia, studies have already shown that *Agrilus planipennis* can be attacked by the braconid *Spathius polonicus* (Fig. 1; Orlova-Bienkowskaja & Belokobylskij, 2014). During the spread of the Emerald ash borer in Europe, *A. planipennis* is likely to be used as a host by a number of native parasitoids that could potentially contribute to its control. These native parasitoids will most probably be parasitoids of other *Agrilus* spp. However, there is limited knowledge of the parasitoids of European *Agrilus* spp. and there is still much confusion regarding their identity. Very few parasitoids of *Agrilus* spp. have reliable barcodes. Many host-parasitoid associations found in the literature may be erroneous, and some groups are in need of taxonomic revision (see Kenis et al., 2024).

Figure 1. Braconid *Spathius polonicus*, a parasitoid of the Emerald ash borer *Agrilus planipennis* (Courtesy: K.V. Makarov [a photo from Orlova-Bienkowskaja & Belokobylskij (2014), with permission]).

At the recent EPPO, FAO-REUFIS, BFW conference 'Safeguarding Forests in Europe: Emerging Risks of *Agrilus* Wood Borers (Buprestidae)' in Vienna which focused on invasive *Agrilus* spp. the possibility of organizing a Europe-wide collection of parasitoids of *Agrilus* species was discussed.

CABI and ANSES-EURL would like to initiate a project to collect specimens and information on these parasitoids of *Agrilus* species. This collection would aid accurate identification (via both morphology and barcoding) and gather information on host association of *Agrilus* parasitoids.

Therefore, the authors below ask the Network members to contact them if they are able to share specimens of parasitoids reared from *Agrilus* spp. in Europe. The parasitoid must have killed an *Agrilus* sp. and not have emerged from another wood borer. Therefore cocoons (Braconidae and Ichneumonidae) or larvae (Chalcidoidea, e.g. Eulophidae, Pteromalidae; Fig. 2) must be collected from *Agrilus* galleries and reared to the adult stage. Live adults should be placed in alcohol (>90%) for barcoding and morphological examination. Ideally, *Agrilus* adults from the same population should be provided in order to identify the host. However, *Agrilus* larvae or pupae could also be provided and identified via barcoding. The identity of the tree species and location data is also necessary.

Figure 2. Parasitoid larvae of *Tetrastichus heeringi* (Chalcidoidea: Eulophidae) in a gallery of *Agrilus viridis* (Courtesy: M. Kenis, CABI).

If you are interested in participating, please contact the authors below. We thank you in advance for your help.

Marc Kenis, CABI, Switzerland
(m.kenis@cabi.org),
Pascal Rousse, ANSES-EURL, France
(pascal.rousse@anses.fr)

References:

Kenis M, Eisenring M, Gossner MM, Seehausen ML (2024) Parasitoids of *Agrilus* spp. in Europe: Anticipating the arrival of *Agrilus planipennis*. *Biological Control* 199: 105655. https://doi.org/10.1016/j.biocontrol.2024.105655

Orlova-Bienkowskaja MJ, Belokobylskij SA (2014) Discovery of the first European parasitoid of the emerald ash borer *Agrilus planipennis* (Coleoptera: Buprestidae). *European Journal of Entomology* 111: 594–596. DOI: 10.14411/eje.2014.061. https://www.eje.cz/artkey/eje-201404-0020_Discovery_of_the_first_European_parasitoid_of_the_emerald_ash_borer_Agrilus_planipennis_Coleoptera_Buprestida.php

AI-based image recognition improves surveillance of *Agrilus* beetles

A recent study performed in the framework of project FORSAID, demonstrates the potential of artificial intelligence to support phytosanitary surveillance of *Agrilus* beetles, including the two EU-regulated species, *Agrilus planipennis* and *A. anxius*. Because surveillance programmes in European Union countries rely on green traps that capture numerous *Agrilus* species, the sorting and identification of specimens are often labour-intensive and require

specialist expertise. To address this challenge, the authors evaluated the Entomoscope, a low-cost open-source digital photomicroscope combined with convolutional neural network (CNN) models for automated species identification (Fig. 1).

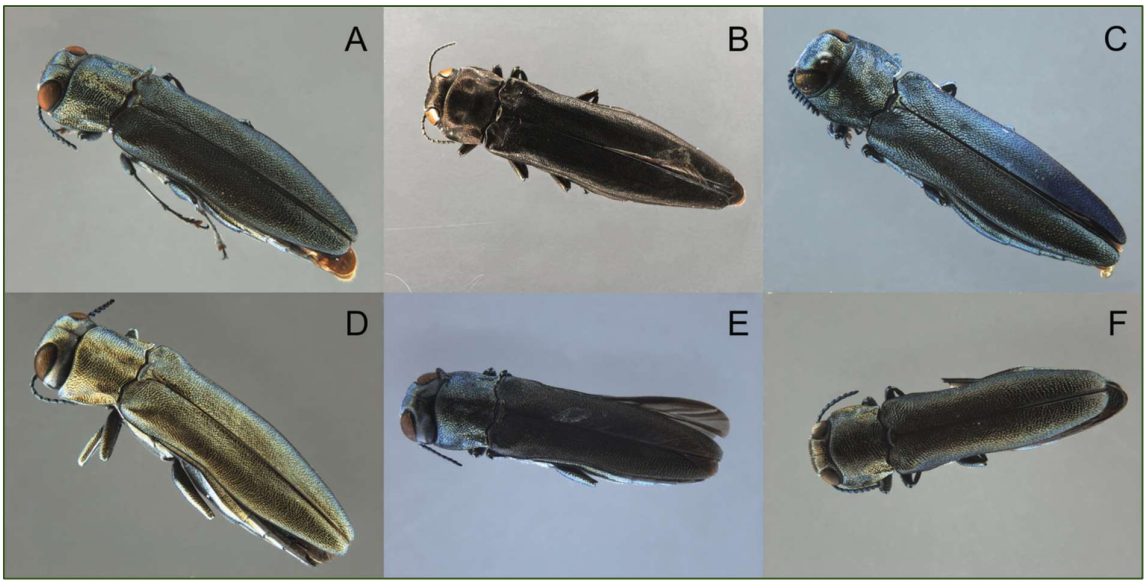


Figure 1. Examples of pictures taken using the Entomoscope to some of the *Agrilus* specimens used during the training process. A. *A. angustulus*; B. *A. anxius*; C. *A. cuprescens*; D. *A. graminis*; E. *A. hastulifer*; F. *A. laticornis*. Note: the pictures are not to scale relative to each other (from: Caruso et al., 2026).

Among the tested architectures, the YOLOv8l model showed the best performance, achieving a Top-1 accuracy of 90.2% on a dataset designed to simulate real surveillance conditions. The system identified *A. planipennis* and *A. anxius* with very few or no errors, although several native *Agrilus* species were more frequently confused. The study provides proof of concept that AI-assisted image recognition can substantially improve the efficiency of surveillance programmes by accelerating specimen identification and supporting rapid phytosanitary response.

Read more:

Caruso V, Shirali H, Bouget C, Cerretti P, Curletti G, de Groot M, Groznik E, Gutowski JM, Pylatiuk C, Plewa R, Roques A, Salle A, Sweeney J, Van Rooyen K, Wührl L, Rassati D (2026) Image-based recognition using advanced neural networks can aid surveillance of *Agrilus* jewel beetles. *NeoBiota* 105: 319—336. https://doi.org/10.3897/neobiota.105.180959

Norway published a risk ranking and prioritization of plant pests report

The Panel on Plant Health of the Norwegian Scientific Committee for Food and Environment published their first progress report on risk ranking and prioritization of plant pests for Norway. EPPO-listed plant pests were assessed and ranked according to the overall risk they pose to Norwegian plant health. Based on probability of entry, probability of establishment (including spread), and potential impact on plant health, pests were classified into five risk classes: very high, high, moderate, low, and very low risk. In this report the Panel has assessed 61 pests: 24 fungi, 12, nematodes, 11 insects, 8 viruses, and 6 bacteria. None of these were assessed to pose very high risk, while one pest (*Fusarium euwallaceae*) was assessed to pose high risk. Six pests were assessed to pose moderate risk: *Dendroctonus ponderosae*, *Tuta absoluta*, *Phymatotrichopsis omnivora*, *Verticillium dahliae* hop strains, *Xanthomonas euvesicatoria* pv. *euvesicatoria*, and *Xanthomonas euvesicatoria* pv. *perforans*. The remaining pests were assessed to pose low risk (16 pests) or very low risk (38 pests) to Norwegian plant health. ***Agrilus bilineatus*** **and** ***Agrilus mali*** **(both are EPPO A2 pests) pose very low risk and** ***Agrilus fleischeri*** **(EPPO A2) poses a low risk.** *Agrilus planipennis* will be assessed later.

EPPO code	Scientific name	EPPO list	Conclusion
AGRLBL	*Agrilus bilineatus*	A2	Very low risk
AGRLFL	*Agrilus fleischeri*	A2	Low risk
AGRLMA	*Agrilus mali*	A2	Very low risk

Read more:

VKM, Krokene P, Alsanius B, Børve J, Flø D, Magnusson C, Nicolaisen M, Line N et al. (2026). Risk ranking and prioritization of plant pests for Norway. Progress report nr. 1. Scientific Opinion of the Panel on Plant Health of the Norwegian Scientific Committee for Food and Environment. *VKM Bulletin* 02. https://vkm.no/english/riskassessments/allpublications/riskrankingplantpestsassessmentfindslowoverallrisk.4.5f5d6e1c19c1e6691c85d8f.html

Preparing for the Emerald ash borer in Great Britain: Two complementary studies

Agrilus planipennis represents one of the most serious potential threats to ash trees in Great Britain, where ash populations are already being heavily affected by ash dieback (*Hymenoscyphus fraxineus)*. Preparing for a possible beetle invasion requires not only an understanding of the pest's biology and spread, but also of how land managers are likely to respond to surveillance and management measures. The two recent studies summarised below address these complementary aspects: the first examines land managers' knowledge, perceptions and intended responses to *A. planipennis*, while the second investigates how these behavioural responses influence the effectiveness of different surveillance and management strategies through integrated modelling. Together, they provide a broader picture of the social and operational factors that are likely to shape preparedness for EAB in Great Britain.

Hall et al (2025): Ash trees in Great Britain: How might land managers respond to a new threat?

This study investigates how land managers in Great Britain might respond to *A. planipennis* if it arrives, given that ash trees already face the widespread threat of *H. fraxineus*.

Key findings

Survey results: 368 land managers completed questionnaires revealing diverse potential responses to *A. planipennis*. Most respondents (65%) personally valued ash trees highly, primarily for wildlife/biodiversity (79%) and landscape character (76%).

Knowledge gap: While 71% knew about *H. fraxineus*, only 12% knew about *A. planipennis*, with 36% knowing nothing about it. These knowledge differences affected risk perception, as 70% of the respondents saw *H. fraxineus* as very high risk versus 30% for *A. planipennis*.

Decision influences: Key factors affecting willingness to implement *A. planipennis* surveillance and management included personal values, previous *H. fraxineus* experience, management objectives, and attitudes toward specific actions. Land-managers with *H. fraxineus* experience were more likely to take *A. planipennis* action.

Management preferences: Sticky traps and branch sampling were proportionally the preferred surveillance methods, while felling infected trees was the most acceptable management option. However, 'Don't know' responses constituted a large proportion of the responses.

Conclusions: Overall, the results demonstrate a range of likely responses to *A. planipennis* arrival into Great Britain. Understanding likely responses will help policymakers better plan for the potential arrival of *A. planipennis* by highlighting where and how interventions and support might be most effective. Findings have practical value for land managers and decision-makers, policy relevance for governance, and add to the evidence on land managers' decision-making when faced with dual environmental threats.

Read more:

Hall C, Marzano M, Karlsdóttir B, Clarke T, Dyke AJ, Morris J, Brown N, Alonso-Chávez V, Milne AE, O'Brien L (2025) Ash trees in Great Britain: How might land-managers respond to a new threat? *Trees, Forests and People* 21, 100915, https://doi.org/10.1016/j.tfp.2025.100915

Alonso Chávez et al. (2026): Surveillance of ash trees under multiple threats: Integrating emerald ash borer and ash dieback dynamics with stakeholder behaviour

This article explores the effectiveness of different surveillance and management strategies for ash trees in Great Britain, focusing on the threats posed by ash dieback disease and the potential invasion of *A. planipennis*. The research integrates a model of *A. planipennis* spread with a sociological model of land manager behaviour to understand how human actions influence the success of contingency plans (Fig. 1).

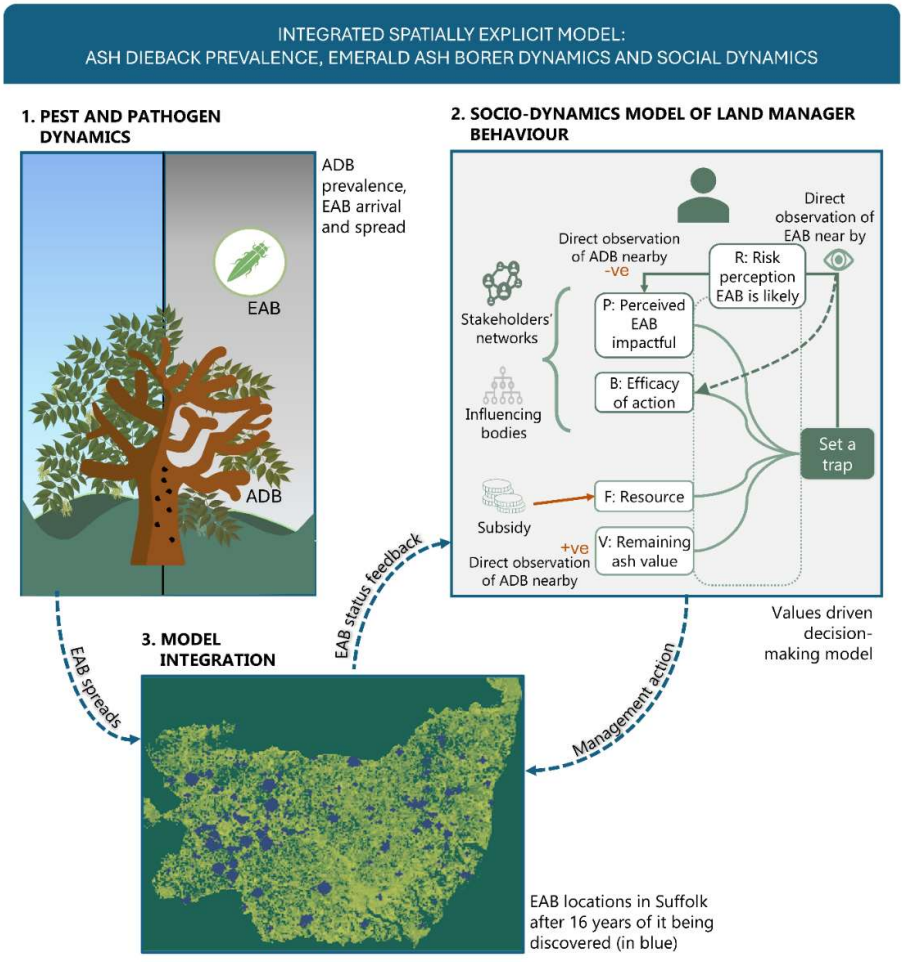


Figure 1. Graphical abstract of the paper.

The study identifies three case study areas (Kent, Suffolk, and North Wales) and simulates various scenarios, including official trapping, tree health and safety (H&S) inspections, and additional voluntary trapping by land managers (with and without subsidies).

Key findings: while official traps alone may slow spread of *A. planipennis* in certain areas, routine ash dieback tree H&S inspections by land managers can significantly contribute to slowing the spread, even if they do not lead to full eradication. Full eradication was only achieved in a small percentage of simulations, primarily when voluntary trapping was subsidised.

Pest management: The effectiveness of pest management is highly sensitive to human behaviour, highlighting the importance of public awareness campaigns, clear information, and incentives to encourage land manager participation in surveillance efforts.

Limitations: The model relies on expert assumptions for certain behavioural aspects. Additionally, the *A. planipennis* dispersal model uses data from North America to parameterise the model. This might overestimate beetle population growth and host mortality in Great Britain.

Main conclusions and outputs: The research highlights that the effectiveness of pest management is significantly influenced by human behaviour. Key conclusions and outputs include:

- **Impact of human behaviour**: The study emphasises that models for effective pest management must integrate both the dynamics of the threat (*A. planipennis* in this case) and the responses of individuals who can influence it.

- **Value of routine Tree-H&S inspections**: When land managers are knowledgeable about *A. planipennis*, routine tree health and safety (H&S) inspections can play a significant role in slowing its spread.

- **Eradication feasibility**: Full eradication of *A. planipennis* was achieved in only approximately 5% of all simulation runs, and this only occurred when volunteer trapping efforts were subsidised.

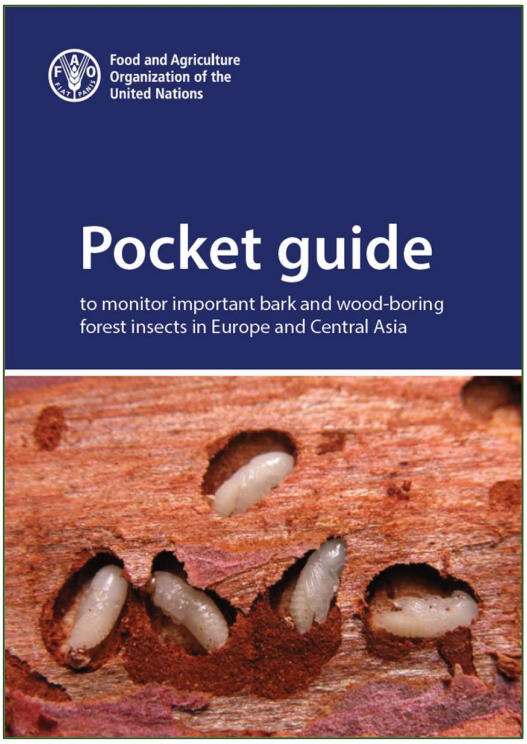
- **Incentivising volunteer participation**: To encourage land manager involvement in voluntary surveillance, targeted campaigns are key. These campaigns should inform land managers and the public about pest threats, highlight the successes of their contributions, and maintain open communication to prevent participation from waning over time.

Read more:

Alonso Chávez V, Brown N, Parnell S, Combes M, Dyke A, Hall C, Karlsdóttir B, Marzano M, Morris J, O'Brien L, Williams D, Milne AE (2026) Surveillance of ash trees under multiple threats: Integrating emerald ash borer and ash dieback dynamics with stakeholder behaviour. *Journal of Applied Ecology* 63, e70304. https://doi.org/10.1111/1365-2664.70304

New publication of FAO: *Pocket guide to monitor important bark and wood-boring forest insects in Europe and Central Asia*

In 2026, the FAO published **Pocket guide to monitor important bark and wood-boring forest insects in Europe and Central Asia**.



This guide addresses the growing problem of the damage caused by bark and wood-boring insects in the forests of Europe and Central Asia, highlighting the expanding threats from both native and non-native species. The guide aims to equip forest practitioners and researchers with the tools and knowledge needed to detect and monitor these harmful insects early, supporting more effective management and protection of forest resources. The guide, developed from the 2022 meeting of the Forest Invasive Species Network for Europe and Central Asia (REUFIS), includes six chapters covering general insect monitoring techniques and detailed information on key insect groups such as jewel beetles, longhorn beetles, bark and ambrosia beetles, wood wasps, and other invasive organisms. Each chapter provides insights into the biology, distribution, and monitoring of these species, empowering practitioners to gather critical data for informed, evidence-based decision-making in forest management.

References:

Lakatos F, Avtzis DN, Sathyapala S (2026) *Pocket guide to monitor important bark and wood-boring forest insects in Europe and Central Asia*. Budapest, FAO. https://doi.org/10.4060/cd5327en; https://openknowledge.fao.org/items/548e3b69-011f-4bec-91e8-95439dde172f

International Forestry Quarantine Research Group Meeting

International Forestry Quarantine Research Group Meeting

28th September to 2nd October 2026

The 23rd meeting of the International Forestry Quarantine Research Group (IFQRG) will be held at the Forest Invasion Synthesis Centre, Czech University of Life Sciences, in Prague, Czech Republic (Kamýcká 129, 165 00 Praha – Suchdol, Czechia) from 28th September to 2nd October 2026.

The meeting will cover updates from international fora and be organized around the following tentative topics:

- Molecular tools: detection, diagnostics, and collaboration,
- Risks in trade from germplasm or plants for planting,
- Research supporting commodity standards,
- Measures addressing major forest pests.

To register for the meeting, email IFQRG Secretary Ms. Meghan Noseworthy (meghan.noseworthy@nrcan.gc.ca).

Please submit presentation proposals **by July 25, 2026.**

Meeting information and past reports are available on the IFQRG page of the IPPC website.

New MSc theses and PhD dissertations using pests of *Fraxinus* spp. as models (with original abstracts)

Boudreault L (2025) Maalhakws (black ash) at the heart of Ndakina: Cultural, ecological, and forestry perspectives in a W8banaki context for the future of a threatened species. PhD in Forest Sciences thesis. Laval University, Quebec, Canada.

Black ash (*Fraxinus nigra*), or maalhakws in the W8banaki language, holds **a central place in the knowledge systems and daily life of the W8banakiak**, particularly through the practice of **basketry**. This practice is rooted in a deep relationship with the land and with the tree itself, which is seen not only as a material, but as a living being, bearer of a shared history. Today, this species is seriously threatened by the emerald ash borer (*Agrilus planipennis*), an invasive insect responsible for the rapid decline of black ash populations across North America.

This thesis examines the **tensions, challenges, and perspectives surrounding the future of black ash and basketry in a W8banaki context**, with the overall objective of supporting the Nation in its adaptation process to this crisis. It draws on the study of the relationship

between the W8banakiak and black ash, as well as on the material properties and growth conditions of this species. The research was conducted through a partnership between the W8banaki Nation, the Bureau du Ndakina, and Université Laval. The interdisciplinary approach combines ethnographic methods, wood anatomical analysis, and ecological assessments.

The first article explores the re**lationship between the W8banakiak and black ash** from a relational and experiential perspective. Using an ethnographic approach. Based on the stories of basket makers, Elders, and staff from Nation organizations, it proposes a three-dimensional analysis: the encounters (with the tree, the land, and the gestures), the transformations (personal and collective) these encounters bring about, and the commitments they generate. The article highlights a form of stewardship rooted in reciprocity and responsibility, embedded in lived and transmitted practices.

The second article focuses on the **physical and mechanical properties of black ash wood**, which explain its use and unique qualities for basketry, making it an irreplaceable species. Through a series of tests conducted on specimens harvested on the Ndakina, the ancestral territory of the W8banaki Nation, the article identifies key anatomical features such as specific ring widths and density that allow the wood to be split into thin, flexible strips, which are then woven into baskets. This work fills a gap in the scientific literature regarding the material itself, while supporting the continuity of W8banaki knowledge related to basketry.

The third article examines the **growth conditions that influence the development of the wood properties valued in W8banaki basketry**. By analyzing the ecological contexts (soil, moisture, inter-tree competition, etc.) in which high-quality black ash trees grow, the article proposes guidelines for the selection, management, and restoration of stands that are suitable for cultural use.

In conclusion, this dissertation offers concrete **pathways for rethinking forest management through grounded, living, and shared knowledge**, rooted in the relationship between the W8banakiak and black ash, its use in basketry practices, and the ecological conditions that sustain this practice. In doing so, it lays the groundwork for future efforts to support the revitalization of black ash and the continuity of both the relationship with this species and the practice of basketry. It thereby contributes to renewing approaches in forestry and conservation, while also engaging in a broader process of reappropriation, cultural continuity, and territorial self-determination.

Garro AR (2026) Characterizing populations of ash specialist insects in forests that have experienced over two decades of ash mortality by emerald ash borer. Bachelor of Science in Agriculture thesis. The Ohio State University, Department of Entomology. kb.osu.edu/bitstreams/ecc56ecf-c7f0-42ca-a9d6-f55be98c1771/download

The invasion of forest ecosystems by emerald ash borer (EAB; *Agrilus planipennis* Fairmaire) has caused extensive mortality of native ash species which threatens native ash specialist arthropods in North America. Despite long term EAB invasion, populations of green ash (*Fraxinus americana*) and black ash (*Fraxinus nigra*), primarily composed of saplings and understory trees, continue to survive in wetland forest ecosystems. In this study, we evaluated the abundance and richness of insect herbivores in the families Curculionidae and

Chrysomelidae (Order Coleoptera) and Tingidae and Miridae (Order Hemiptera) that specialize on green and black ash in long term forest research sites which have experienced the longest duration of EAB impacts in North America. We found four species (15%) of ash specialist herbivores known from the region of which all were collected in low abundance on green and black ash. Specialist abundance and species richness were higher on ash that had declining canopies compared to ash with healthy canopies. **The rarity of ash specialists in the landscape further supports that their populations have been threatened by ash mortality caused by EAB**. Despite this, the detection of several specialist species suggests that some have been able to utilize smaller size classes of ash which continue to persist in forest understories. To support conservation initiatives, we recommend conducting baseline surveys for ash specialists in regions that have yet to experience substantial ash mortality in order to track the health of herbivore populations.

Switala E (2026) Characterizing the relationships between hydrology, soil biogeochemistry, and green ash canopy structure in emerald ash borer-affected wetlands. Thesis. Master of Science in Environmental Science, College of Science, Rochester Institute of Technology, USA. https://repository.rit.edu/cgi/viewcontent.cgi?article=13826&context=theses

The invasion of the emerald ash borer (EAB; *Agrilus planipennis*) has caused mass mortality of native ash trees (*Fraxinus* spp.), devastating forested wetlands in the northeastern United States. Fifteen years post-introduction, the long-term ecological shifts and "new normals" of these ecosystems remain poorly understood. **This project characterized patterns in EAB-affected forested wetlands** by evaluating soil characteristics, biogeochemical cycling, hydrology, and green ash canopy across 12 sites with varying initial ash presence. Results revealed **a clear separation between biogeochemically active and less active sites**. **Hydrologic differences emerged as a key driver of biogeochemical cycling**, with higher soil moisture significantly increasing rates of potential denitrification, anaerobic methane and carbon dioxide production, aerobic respiration, and nitrification. In combination with moisture, nutrient availability was a primary driver of carbon and nitrogen cycling, partitioning process rates based on anaerobic/aerobic conditions and available nutrients. Based on these results, it is hypothesized that **the loss of transpiration via ash mortality results in wetter environments, accelerating these processes, increasing methane emission and nitrate buildup**. Ash Mortality Index (AMI) and soil moisture emerge as measurements that could indicate heightened biogeochemical activity, which can be used to continue monitoring of EAB-affected forested wetlands.

Swart TJ (2026) Indiana's future forests: Emptied niche occupation in an ash-less world. MSc thesis. Department of Forestry and Natural Resources, Purdue University. West Lafayette, Indiana, USA. https://hammer.purdue.edu/ndownloader/files/64220676

Disturbance is a primary driver of forest composition and structure, shaping successional trajectories and ecosystem function. In eastern North America, disturbance regimes have been substantially altered by the introduction of invasive pests and pathogens. Emerald ash borer (EAB; *Agrilus planipennis*) is a host-specific invasive insect that has caused widespread mortality of ash (*Fraxinus* spp.), creating canopy gaps and altering forest dynamics. This thesis **examines regeneration and gap dynamics following EAB-induced ash mortality**

using long-term datasets established in Indiana prior to invasion. Specifically, this research evaluates **how seedling and sapling regeneration are influenced by geographic, environmental, and pre-disturbance composition**, and **how variation in gap structure influences vegetation response in a relict old-growth forest**. Following EAB-induced mortality, ash regeneration declined sharply across sites, while regeneration layers became increasingly dominated by shade-tolerant and mesophytic species, including sugar maple (*Acer saccharum*), spicebush (*Lindera benzoin*), pawpaw (*Asimina triloba*), and elm (*Ulmus* spp.), as well as invasive shrubs. Compositional shifts were most pronounced in the seedling layer, indicating directional restructuring towards homogenization. In the relict Davis-Purdue Research Forest, **complete ash mortality reduced canopy cover and created gaps, yet regeneration remained dominated by shade-tolerant species**. **Gap size and structure did not significantly influence regeneration density or ash recruitment**. Instead, **canopy gaps were filled primarily through lateral infill and growth of established understory individuals**. These findings demonstrate that forest response to EAB is strongly constrained by pre-existing regeneration. Ash mortality accelerated ongoing mesophication and reinforced late-successional trajectories rather than resetting successional pathways.

Tayal A (2025) Long-term impacts of disturbance on plant and insect communities in forest ecosystems. Master of Science Thesis. Graduate School. Graduate Program in Entomology The Ohio State University, USA. https://etd.ohiolink.edu/acprod/odb_etd/ws/send_file/send?accession=osu1764807087765684&disposition=inline

Natural and anthropogenic disturbances including invasive insect outbreaks, windstorms, and tree harvesting impact forest ecosystems by changing abiotic and biotic conditions. These disturbances create forest gaps, which can stimulate the growth of tree regeneration and create islands of early-successional habitat. These gaps can harbor insect communities that differ in species and traits from those of the undisturbed forest. While short-term impacts of disturbance in forest ecosystems are more commonly studied, there are gaps in knowledge of long-term effects of disturbance, as well as effects of multiple disturbances in sequence. However, these questions are important because insects play important roles in sustaining food webs, decomposing waste, and pollinating crops. Understanding forest disturbances can help humans to make decisions that conserve biodiversity. When emerald ash borer (EAB) populations swept through forests of **southeast Michigan** and killed overstory ash trees, **there were surviving ash in the understory which were too small to be killed by EAB**. This cohort of surviving ash represents a possibility for ash trees to reclaim a place in the canopy, but residual populations of EAB may affect this possibility. We studied **long-term monitoring plots near Detroit, MI where EAB has been present for over 20 years**, asking whether ash (*Fraxinus* spp.) regeneration has persisted and grown, and how EAB and its natural enemies are influencing ash regeneration. Each forest stand was previously classified into three categories, hydric, mesic, and xeric, based on hydrology and predominate ash species. We found that the size distribution and abundance of ash regeneration differs based on the hydrology of forest stands. In mesic and xeric forests, ash regeneration is surviving, but remains small, mostly **below 2.5 cm diameter** at breast height (DBH). Meanwhile, ash regeneration in some hydric stands has **reached larger sizes (2.5-10 cm DBH) which are susceptible to EAB attack**. **While symptoms of EAB are common, some regeneration remains healthy.** We also recovered three species of introduced **parasitoid wasp** which

might help control EAB populations. Our results suggest **that ash regeneration has, with few exceptions, not grown large enough to produce seeds, but may persist if parasitoid wasps can control EAB populations**. In addition to insect outbreaks, forest ecosystems are periodically affected by natural disturbance such as windthrow, which creates canopy gaps and changes abiotic conditions in the understory layer. Forest managers often harvest fallen trees affected by windthrow in a process called salvage logging, but this practice may have long-term effects on biodiversity. We studied **the short- and longer-term impacts of a tornado disturbance and subsequent salvage-logging on ground beetles** (Coleoptera: Carabidae). We hypothesized that both the windthrow and subsequent salvage-logging would increase alpha-diversity initially, but that salvage-logged plots would have lower diversity in the longer-term, due to alteration of biological legacies such as woody debris. The study site was Powdermill Nature Reserve in Westmoreland County, Pennsylvania, where a tornado occurred in 2012, and salvage-logging occurred on half of the windthrow site. We sampled ground beetles during the growing seasons of 2015 and 2022, identified ground beetles to species, and measured 10 functional traits of each species. Our results show that salvage-logged habitat differed in species and traits from undisturbed forest, while unsalvaged windthrow was similar to the undisturbed forest. Carabid species common in salvage-logged habitat tended to be smaller, and have larger eyes and longer rear trochanters, suggesting that environmental conditions are filtering species based on their traits. Differences between forest management treatments were still detectable nine years after salvage-logging, indicating that combined natural and anthropogenic disturbances have lasting impacts on biodiversity. Combined, our research shows that **forest disturbances play out over decades and have outcomes for biodiversity** that depend on interactions between plants and animals. For example, whether ash persists in forests depends on tri-trophic interactions between trees, their pests, and the natural enemies of those pests. How forest disturbance impacts ground beetles depends on how the disturbance alters vegetation and woody debris resources that each species may depend on. Furthermore, examining functional traits, such as flood-tolerance of trees and sensory strategies of ground beetles, can help us understand and predict the long-term impacts of forest disturbance.

Wiley CS (2026) Remove to recruit: The short-term efficacy of invasive shrub removal in a Minnesota Floodplain Forest. Biology Honors Projects. 35. Biology Department. Macalester College. Saint Paul, Minnesota USA. https://digitalcommons.macalester.edu/biology_honors/35

Within Midwest floodplain forests, there is a lack of long-term studies focusing on native tree recruitment post invasive shrub removal. With interacting threats such as emerald ash borer (*Agrilus planipennis*), invasive earthworms, and white-tailed deer (*Odocoileus virginianus*), land managers need particular information about these ecosystems in order to better understand how to protect them. **This study aims to explore the efficacy of the removal of *Rhamnus cathartica* and *Lonicera* spp. in promoting native tree recruitment** within a Minnesota floodplain forest along the Mississippi River. Results revealed that **post removal ash (*Fraxinus* spp.) seedling abundance increased, enhancing recruitment**. Additionally, evidence showed moderate deer impacts on overall vegetation community structure.

A closing remark

This concludes the content of the 10th Newsletter issue. The EPPO Secretariat **welcomes submissions** of comments, updates, publications, links to recent scientific papers and conference abstracts from you and your colleagues, as well as any other relevant information or announcements related to the Emerald ash borer, for circulation through future editions of the Newsletter. We also encourage readers to share information about the Newsletter with colleagues in your country and internationally. The email for correspondence is dm@eppo.int (Dmitrii Musolin).

References received (July 2026; with original abstracts)

Alonso Chávez V, Brown N, Parnell S, Combes M, Dyke A, Hall C, Karlsdóttir B, Marzano M, Morris J, O'Brien L, Williams D, Milne AE (2026) Surveillance of ash trees under multiple threats: Integrating emerald ash borer and ash dieback dynamics with stakeholder behaviour. *Journal of Applied Ecology* 63, e70304. https://doi.org/10.1111/1365-2664.70304

Across the world, emerging pests and diseases are increasing in number, range and co-occurring with other invasive biotic factors. Ash trees (*Fraxinus excelsior* L.; Oleaceae) in Great Britain face the potential invasion of the emerald ash borer (EAB; *Agrilus planipennis* Fairmaire; Coleoptera: Buprestidae) and the ongoing impact of ash dieback (ADB; *Hymenoscyphus fraxineus* T. Kowalski (Helotiales: Helotiaceae)). Surveillance and management strategies accounting for land manager behaviour are crucial for improved control.

1. We developed a spatially explicit model that integrates (i) the estimated prevalence of ADB, (ii) the dynamics of EAB arrival and spread and (iii) a socio-dynamics model, based on a values-driven theory that simulates land manager decision-making in relation to surveillance and tree management. In the model, if EAB is detected, contingency measures—including tree felling and intensified monitoring—are enacted, with the potential to eradicate or slow its spread. We used the model to assess whether targeting high-risk sites with traps, using routine tree inspections by land managers, or encouraging volunteer surveillance (with or without subsidised trapping) could significantly slow EAB spread.

2. Interviews ($n = 45$), a survey ($n = 368$), and three workshops ($n = 27$) informed the socio-dynamics model's structure and parameterisation. The interaction between EAB and ADB is complex, with potential positive effects (e.g. increased perceived value of ash) and negative effects (e.g. belief that ash cannot be saved, misidentification of decline causes).

3. Results showed that **if land managers are made aware of EAB**, health and safety inspections have a substantial **role to play in slowing the spread** but are **unlikely to lead to eradication** due to the pest's cryptic larval phase. Official trapping at a limited number of locations is similarly unlikely to succeed in early detection and eradication unless entry pathways are well-defined, and ash connectivity is low. Volunteer trapping is important for early detection and if this is subsidised, EAB eradication becomes more likely.

4. Synthesis and applications. Tree-health policies must balance identifying likely entry points and deployment of traps, targeted information campaigns and surveillance subsidies for land managers. Our unique, cross-disciplinary approach can be applied to other pest/pathogen systems to inform tree-health plans and how to balance resources.

Augustinus BA, Epanchin-Niell RS, Queloz V, Brockerhoff EG (2026) Bioeconomic optimization of surveillance for detecting and eradicating quarantine forest pests and pathogens. *Ecological Economics* 247, 109053. https://doi.org/10.1016/j.ecolecon.2026.109053

Early detection is critical for effective responses to incursions of invasive species, making surveillance programs for potential invaders essential. As resources are limited, surveillance activities must be as effective and efficient as possible. We used a bioeconomic model to develop an optimal surveillance programme for six priority quarantine and two quarantine forest pests in Switzerland. We aimed to minimize costs of management (i.e., surveillance and eradication) for species that are mandated for eradication based on collaborative biosecurity agreements with the European Union. The model determined optimal surveillance effort, accounting for differences in introduction likelihood, detectability, and spread rates, across pests and locales. The model suggested a likely underestimate of optimal investment of 1,187,000 CHF per year for surveillance using visual surveys and insect or spore traps, depending on the target species. Survey recommendations varied across locales and pest types with the greatest surveillance effort for *Agrilus planipennis*, *Bursaphelenchus xylophilus, Dendrolimus sibiricus, Fusarium circinatum, and Phytophthora ramorum*. Surveillance trapping would be economically irrational for two pests (*Anoplophora glabripennis, A. chinensis*), primarily because of high probability of background detection by the public, and low efficacy of formal surveys and low spread rates. **The model indicates where in Switzerland surveillance yields the highest economic return, with greater survey effort in areas with highest introduction risk and for species with low likelihoods of public detection and fast spread rates.** The model indicates that **the use of more effective trapping methods and an increase in public awareness could reduce the needed investments in formal surveillance activities**.

Babych Y, Puzrina N (2025) Causes and trends in pathological damage to common ash. *Scientific Reports of the National University of Life and Environmental Sciences of Ukraine* 21(6), 79—92. doi: 10.31548/dopovidi/6.2025.79

Intensive dieback of *Fraxinus excelsior* L. in the Forest-Steppe zone of Ukraine has led to a significant deterioration in the sanitary condition of ash stands and increased the risk of losing their ecosystem stability, making this issue particularly urgent amid the simultaneous influence of pathogens and the activation of a complex of stem-damaging insect species. This study aimed to analyse the ecological role of common ash in forest ecosystems, as well as to assess the sanitary condition and causes of ash stand decline, particularly the impact of *Hymenoscyphus fraxineus* and *Agrilus planipennis*. The study employed methods of analytical review, synthesis of previous research, critical comparison of results obtained by different authors, and logical-structural

generalisation to identify key patterns in the development of pathological processes in ash stands. It was established that common ash supports intensive nutrient cycling due to litterfall with a high content of calcium and magnesium, and the rapid mineralisation of organic matter, which supports soil fertility and understorey development. According to the analysed studies, **more than 950 associated species have been recorded, including 44 obligate and 62 highly specialised organisms, demonstrating the ash's importance for biodiversity**. The loss of ash reduces the rate of organic matter mineralisation and disrupts the nitrogen and carbon balances in the soil. Analysis of the sanitary condition in the Right-Bank Forest-Steppe of Ukraine showed that the most severely affected stands are located in the Cherkasy and Vinnytsia regions, where the area of dieback exceeds 600 ha. The **main degradation factors include infections caused by *Hymenoscyphus fraxineus*, damage by *Agrilus planipennis*, bacterial diseases, and the combined influence of saprotrophic fungi.** The results also indicate a strong relationship between the intensity of damage and tree age, stand density, and soil type, which enables the identification of zones at the greatest risk.

Balzer Z, Roe A, Cullingham C, Coltman D (2026) The genomic impacts of rapid range expansions. *Genome* 69: 1—15. dx.doi.org/10.1139/gen-2025-0065

Human-mediated change has resulted in the expansion of many species into novel habitats. Range expansions have been described demographically as either pulled or pushed, depending on the number of individuals on the leading front, and can leave distinct genomic signatures within the genome. The recent expansions of *Agrilus planipennis*, *Lycorma delicatula*, and *Dendroctonus ponderosae* represent different types of range expansion which can be analyzed by coupling rigorous monitoring of recent expansions with whole-genome assemblies to provide a strong comparative framework with which to study the genomic signatures of expansion type. Here, we synthesize range expansion theory in the context of these recent expansions and generate hypotheses on the expected patterns of genomic change. We then outline statistical and genome-structural methods that can be used to identify putatively adaptive loci, leveraging the increased genomic resolution provided by whole-genome assemblies. Finally, we complement the overarching expansion hypotheses with a discussion of using a top-down approach to identify loci under selection, using cold tolerance traits as an example. With these methods we can better understand the risk of further spread and persistence of these expanding insect populations, as well as establish a framework for quantifying the adaptive potential of other expanding species.

Caruso V, Shirali H, Bouget C, Cerretti P, Curletti G, de Groot M, Groznik E, Gutowski JM, Pylatiuk C, Plewa R, Roques A, Salle A, Sweeney J, Van Rooyen K, Wührl L, Rassati D (2026) Image-based recognition using advanced neural networks can aid surveillance of *Agrilus* jewel beetles. *NeoBiota* 105: 319—336. https://doi.org/10.3897/neobiota.105.180959

The genus *Agrilus* includes two species, *Agrilus planipennis* and *A. anxius*, that are of particular phytosanitary concern and that are regulated by the European Union

legislation. This implies that phytosanitary agencies of all EU countries are obliged to establish specific surveillance programmes to verify the absence of these species from their territory. These activities commonly consist of the use of green-coloured traps, which are, however, attractive not only for *A. planipennis* and *A. anxius*, but also for a wide range of other *Agrilus* species. For this reason, much time and expertise is required to sort and identify specimens to species, impeding an efficient rapid response. In this study, we tested the efficacy of the Entomoscope, a low-cost, open-source photomicroscope that uses high-resolution digital imaging and allows a pre-trained Convolutional Neural Networks (CNN) model to accurately detect, image and classify insect specimens, for automatic identification of 13 *Agrilus* species, including *A. planipennis* and *A. anxius*. We benchmarked models from three different CNN architectures and selected **YOLOv8l as the most robust performer**; this model achieved a **Top-1 accuracy of 90.2%** on a "real-world" test set (i.e. a dataset simulating real surveillance conditions). **For most species, including *A. planipennis* and *A. anxius*, either no errors or only a few errors were made, whereas for a few native species, misidentifications were more common**. These results provided proof of concept for an AI-driven surveillance system that can strongly aid in surveillance activities of *Agrilus* species.

Chandler JL, Duan J, Trotter RT III, Elkinton J (2026) Effects of larval stage and diapause status on cold hardiness of emerald ash borer (Coleoptera: Buprestidae): implications for winter survival and establishmentю *Journal of Economic Entomology* toag006, https://doi.org/10.1093/jee/toag006

Though a minor forest pest in its native range in Asia, the emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, causes widespread ash (*Fraxinus* sppю) mortality throughout its invaded range in North America and Europe. The rapid range expansion demonstrated by EAB suggests this beetle possesses extraordinary tolerance for a broad range of climatic conditions. While previous studies have measured the cold tolerance of overwintering EAB larvae, none have considered the effect of developmental stage or diapause condition on cold hardiness. By testing the supercooling point (SCP) of lab-reared and field-collected larvae, we evaluated EAB cold hardiness at multiple developmental stages and diapause phases following exposure to different temperature regimes. Results of SCP testing indicated feeding larval stages and larvae in late diapause may be most susceptible to freeze-induced mortality, suggesting that semivoltinism and late-winter freeze events may limit winter survival within EAB populations. Results of field studies confirmed that **cold hardiness in EAB is a plastic trait that increases with exposure to lower temperatures**, but indicated **plasticity may differ between populations**. Together, these findings indicate that developmental stage, diapause phase, induction of cold hardiness, and geographic origin may all contribute to the ability of EAB larvae to acclimatize to and survive cold temperatures. Our findings contribute to our understanding of how environmental and physiological factors interact to impact winter survival of EAB and therefore, may improve estimates of the potential invasive range of EAB.

Cipollini D, Cipollini K (2026) The Fate of a wild white fringetree (*Chionanthus virginicus*) population in Ohio 10 years after invasion by Emerald ash borer (*Agrilus planipennis*). *Forests* 17: 712. https://doi.org/10.3390/f17060712

Emerald ash borer (EAB) is an invasive Asian wood borer that has killed hundreds of millions of ash trees across North America. White fringetree is a secondary host of EAB in North America that is generally more resistant and resilient than ash. Past studies have mostly focused on ornamentally planted and managed trees over short time scales; the long-term fate of this species in the wild is uncertain. We revisited an unmanaged wild population of white fringetree in Ohio ten years after it was first studied, measuring tree size and health, evidence of EAB attack, and woodpecker activity. We hypothesized that EAB attack would have greater negative effects on this population than previously observed in managed populations. In 2024, 68% of trees showed signs of previous attack by EAB with declining health and 15% had evidence of current-year attack. Thirty percent of trees in the study had died. **White fringetrees in managed populations have generally fared well** in the aftermath of EAB, but trees in this wild population **showed substantial attack and damage**, some continuing to host EAB for several years. **Wild white fringetrees may meet the same fate as ash trees in the face of EAB, but over longer time scales**.

Davenport SW, Bronson DR, Hofmeister K, Kolka RK, Boyle G, Liu F (2026) Influences on growth and survival of seedlings planted in black ash stands of Northern Michigan and Wisconsin. Forest Ecology and Management 609, 123647. https://doi.org/10.1016/j.foreco.2026.123647

The invasive emerald ash borer (*Agrilus planipennis*) is a threat to all North American ash (genus *Fraxinus*) trees, but wetland ecosystems dominated by black ash (*F. nigra*) are of particular concern to land managers. The rapid and extensive death of black ash on the landscape causes unprecedented ecological and hydrological impacts to cascade through the ecosystem. A strategy to combat such impacts and maintain these wetlands as forested is to underplant these stands with seedlings of alternative species that are capable of maturing into canopy trees. This study planted seedlings of seven non-ash tree species in black ash wetlands across northern Michigan and Wisconsin and assessed the factors that have the greatest effect on seedling survival and growth. First year survival across all species was 54 %, and by two years after planting total survival was 47 % with a mean relative growth rate of 5.47 cm/yr. The best-performing species in terms of both survival and growth rates were river birch (*Betula nigra*), silver maple (*Acer saccharinum*), and swamp white oak (*Quercus bicolor*). Bur oak (*Q. macrocarpa*) and red maple (*A. rubrum*) also exhibited high rates of survival despite having below average growth rates. The **main factors influencing seedling performance were hydrology and microtopography**, with greatly increased survival for seedlings planted on higher microsites further from the water table. Insufficient natural regeneration of canopy species observed in the understory of all stands warrants planting within these systems to avoid the vegetative community shift to dominance of herbaceous or shrub species.

Dearborn KW, Inward DJG, Smith SM, MacQuarrie CJK (2026) Temperature impacts on mating and oviposition of the Emerald Ash Borer, *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae). *Entomologia Experimentalis et Applicata* 174 (7): 715–724. https://doi.org/10.1111/eea.70105

> Local temperatures can shape the ability of introduced species to flourish and disrupt novel environments. The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae), is an invasive beetle that threatens ash trees in North America and Europe. To assess the role of temperature on EAB reproduction, we reared groups of adult beetles at one of four temperatures (12°C, 15°C, 18°C, and 21°C) and measured reproductive success (laying fertilized eggs and egg hatching). There was **no effect of rearing temperature on EAB female lifespans, but no eggs laid at 15°C or 18°C hatched**, suggesting these temperatures disrupt the reproductive process of EAB. Females reared at 21°C, however, consistently laid eggs that hatched. We then used these results to assess the likelihood of reproductive success over a recent 10-year period in eight cities in Canada that host EAB. All locations experienced temperatures of ≥21°C, but the number of hours and the number of days above this critical temperature were highly variable. There were ample opportunities in all locations for EAB to reproduce, but **EAB in cooler cities would experience thermal limitations**, thus slowing the spread of EAB populations.

Duan JJ, Petrice TR, Schmude JM, Hagerty T (2026) Temperature-dependent response of diapause termination in emerald ash borer (Coleoptera: Buprestidae): implications for its geographic distribution. *Journal of Economic Entomology*. https://doi.org/10.1093/jee/toag167

> The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae), native to Northeast Asia, is the most destructive invasive pest of ash (*Fraxinus* spp.) in North America. In this study, we exposed mature fourth-instar diapausing EAB larvae (J-shaped or J-larvae) to nine temperatures ranging from 1.7 to 23.9 °C for 90 days, and then evaluated their diapause termination by measuring both the probability and timing of post-chill development to adults under warm rearing conditions (27 ± 0.5 °C, 16:8 h L: D). We also determined the effect of chill temperature on the mortality of diapausing J-larvae. Results showed that **J-larvae successfully completed diapause after exposure to temperatures between 7.2 and 15.6 °C for 90 days** and chill treatment significantly affected the duration required for post diapause development to adult emergence, with the mean number of days required for adult emergence increasing as chill temperature increased. In addition, the **mortality rate for the EAB larvae** that died at the J-larval stage before completing diapause development to adults was lower (0 to 7.1%) for temperatures between 1.7 and 12.8 °C than that (16 to 32.6%) for temperatures between 15.6 and 23.9 °C. These results refine our understanding of the thermal limits for EAB diapause termination and provide insight into how climatic conditions may influence EAB phenology and distribution across its geographic range.

Eisenring M, Roe AD, Queloz V, St. Amour J, Li Z, Perret-Gentil A, Schertler E, Glauser G, Sahli M, Gossner MM (2026) A recent ash dieback infection neither affects emerald ash borer performance nor triggers a substantial systemic phytochemical defense response in European ash. *J Pest Sci* 99, 44. https://doi.org/10.1007/s10340-025-01981-4

> The number of non-native invasive species has increased markedly in recent decades, raising the likelihood of co-occurrence and interactions among invaders. Such interactions may exacerbate impacts on native ecosystems, making it essential to understand co-invasion dynamics for effective pest management and conservation. European ash (*Fraxinus excelsior*) is simultaneously threatened by two invasive species: The fungus *Hymenoscyphus fraxineus*, which causes ash dieback (ADB), and the emerald ash borer (EAB), *Agrilus planipennis*, a phloem-feeding beetle. Although their invaded ranges overlap in parts of eastern Europe, it remains unclear how these species interact within the same host. We investigated whether recent ADB stem infections affect EAB performance, and whether such effects are mediated by changes in ash phytochemistry. Our findings indicate that neither larval nor adult EAB performance was affected when feeding on ADB-infected trees. Phloem chemistry showed localized changes near the ADB infection front but remained unaltered 18–20 cm away. Also leaf chemistry was only minimally affected by an ADB stem infection. These limited systemic responses suggest that *F. excelsior* relies primarily on constitutive phytochemical defenses against ADB. Therefore, ADB-induced phytochemical changes in recently infected trees do not affect EAB performance. We conclude that **freshly ADB-infected trees neither promote nor inhibit EAB development**. From a pest management standpoint, **immediate sanitary removal of ADB-infected trees may not be necessary in stands only recently affected by the pathogen, as potential beneficial ADB infection effects on EAB are unlikely**. However, the long-term impact of chronic ADB stress on EAB dynamics remains uncertain and warrants further investigation.

Ferguson H, Layton B, Mills MP (2026) Early detection of *Agrilus planipennis* using environmental DNA. Presentation at 24th Annual Urban Ecology & Conservation Symposium, March 16th, 2026. Portland State University, USA. https://pdxscholar.library.pdx.edu/uerc/2026/presentations/4/

> As a recent pest to Oregon, *Agrilus planipennis* (Emerald Ash Borer, EAB) stands to decimate native ash tree stands, as it has throughout Eastern USA. As shown in common garden studies, Oregon Ash is extremely susceptible to EAB with expected mortality rates of 99% (Herms, 2015). EAB infestations are cryptic, and traditional monitoring relies on advanced infestations and costly tree girdling and bark peeling, resulting in appropriate responses lagging the leading edge of the infestation. Environmental DNA (eDNA), the practice of collecting and identifying traces of DNA left in an environmental sample, is **a promising tool for early infestation detection** and has previously been used to detect EAB in frass samples (Kyei-Pokuet al., 2020, Kyle et al., 2024). Yet, a fast and inexpensive method for eDNA collection is lacking. Prior work found eDNA samples taken with sterilized paint rollers reliably detected *Lycorma delicatula* (spotted lantern fly, Peterson et al., 2022). Along these lines, the aim of our multiagency project was to determine whether paint rollers could be used to identify EAB infested trees. Using a modified version of the protocol from Peterson et

al. (2022), method validation trials have demonstrated the following: 1) **eDNA samples from confirmed EAB infested trees return a positive DNA detection**; 2) eDNA samples from assumed negative EAB infested trees (outside infestation region) return a negative DNA detection; and 3) **Sampling along transects may provide more reliable early detection and delineation of an EAB infestation, as compared to traditional monitoring methods**.

Green MA, Duan JJ, Barnes BF, Gandhi KJK, Dodge C, Andersen JC (2026) Overwintering survival and emergence phenology of two introduced *Spathius* species for emerald ash borer biological control across a latitudinal gradient in the U.S. *Biological Control* 218, 106072. https://doi.org/10.1016/j.biocontrol.2026.106072

Spathius agrili Yang and *S. galinae* Belokobylskij & Strazanac are two larval parasitoids introduced as classical biological control agents against the emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, in the United States. While ***S. galinae* has established and contributed to suppression of EAB populations in the northern United States**, ***S. agrili* has thus far failed to establish**. We conducted a semi-field study to evaluate the overwintering survival and phenology of both species across a latitudinal gradient to examine how climate may have influenced their differential success. We placed logs containing late instars of *S. agrili* and *S. galinae* larvae at three field sites (Delaware, Georgia, and Massachusetts) in late fall of 2023 and monitored adult emergence throughout 2024. We found that ***S. agrili* emerged earlier than *S. galinae*** in Delaware and that Georgia had the earliest emergence date. However, **overwintering mortality of *S. agrili* (N = 560) was 18.1–40.1% greater than *S. galinae* (N = 661)** in all states. The probability of *S. agrili* remaining alive and in diapause through spring and summer was greatest in Massachusetts while the probability of *S. galinae* remaining in diapause was greatest in Georgia. Our results suggest that ***S. agrili* can emerge much earlier than previously documented**. Additionally, **high *S. agrili* mortality may be due to a portion of individuals waiting to emerge later in the season but failing to do so**. Finally, individuals remaining in diapause through spring and summer was likely due to poor climatic matches.

Hall C, Marzano M, Karlsdóttir B, Clarke T, Dyke AJ, Morris J, Brown N, Alonso-Chávez V, Milne AE, O'Brien L (2025) Ash trees in Great Britain: How might land-managers respond to a new threat? *Trees, Forests and People* 21, 100915, https://doi.org/10.1016/j.tfp.2025.100915

Ash trees across Great Britain are under increasing threat from pests and diseases as ash dieback (ADB) continues to spread and intensify in impact. Meanwhile, concerns grow throughout Europe about the westward spread of emerald ash borer (EAB). Should EAB be discovered in Great Britain, decisions taken by managers of ash trees will be crucial to their survival, given the threat they already face from ADB. This study has investigated the likely responses of land-managers to EAB, their willingness to implement surveillance for EAB, their knowledge of EAB, and the importance of ash trees to them. An online questionnaire was conducted in 2021 with diverse land-managers across Great Britain. Analysis of **368 completed questionnaires** revealed some of the **potential influences on decisions** that **land-managers might make**

concerning surveillance and management for EAB. These include: the **personal importance of ash trees** to land-managers, their **perceptions of EAB risk**, previous **experience with ADB**, self-reported **knowledge of EAB**, and **management aims for the trees**. Overall, the results demonstrate **a range of likely responses to EAB**. Understanding likely responses will help policymakers better plan for the potential arrival of EAB by highlighting where and how interventions and support might be most effective. Findings have practical value for land-managers and decision-makers, policy relevance for governance, and also add to the evidence about land-manager decision-making when faced with dual environmental threats.

Hallett RA, Sonti NF, Piana MR, Zalesny RS (2026) Early establishment performance of hybrid *Populus* and *Salix* in canopy gaps of a post emerald ash borer urban forest. *Urban Forestry & Urban Greening* 124, 129564. https://doi.org/10.1016/j.ufug.2026.129564

Urban forests face challenges from invasive species, deer herbivory, and tree mortality, creating gaps where natural regeneration fails. We tested whether fast-growing hybrid *Populus* and *Salix* genotypes could facilitate urban forest restoration in post-emerald ash borer (*Agrilus planipennis*) canopy gaps. We planted six genotypes of each genus using two methods—potted trees and direct-planted cuttings across five 21 × 21-meter plots in Baltimore, Maryland, USA. We assessed initial light availability above each planted tree as canopy leaf area index (LAI). From 2021–2023, we measured survival, growth, stress indicators, and photosynthetic performance for 720 trees. Potted trees significantly outperformed cuttings, achieving 59% three-year survival compared to only 14% for cuttings. Among potted trees, *Populus* genotypes grew 73% more than *Salix* counterparts with no significant survival difference. Light availability strongly influenced establishment success, ***Populus* showed greater sensitivity to shade than *Salix***, exhibiting declining survival and increasing stress as LAI increased. Optimal planting zones occurred where overhead LAI remained below 1.4. Areas where established cover had an LAI > 2.7 presented elevated mortality risk. Genotype variation emerged within both genera, with superior performers identified through comprehensive multi-trait rankings via phyto-recurrent selection. These results demonstrate that ***Populus* and *Salix* genotypes planted as potted stock can successfully establish in challenging urban environments** when planted in canopy gaps with adequate light and when appropriate genotypes are selected. The rapid growth offers significant advantages for restoration goals, providing early canopy closure to suppress invasive species while reducing long-term maintenance requirements in urban forest restoration projects.

Hudak PF (2026) Recovery from emerald ash borer (*Agrilus planipennis* Fairmaire) infestation in a suburban lake environment. *Natural Built Social Environment Health* 2(2), 164—172. http://www.doi.org/10.63095/NBSEH.26.231190

Field observations documented patterns of green ash (*Fraxinus pennsylvanica*) **recovery following emerald ash borer** (*Agrilus planipennis* Fairmaire) (EAB) infestation at Lewisville Lake in north-central Texas. A total of 119 trees were observed in three diameter classes along a 1 km nature trail. The trail winds through mown and unmown sections of remnant bottomland behind residential lots. Of the

small (<2.5 cm), medium (2.5—15 cm), and large (>15 cm) diameter classes, large specimens suffered the most damage. None of the 31 large trees were healthy, though several had healthy epicormic branches near the base of the tree. Most of the 15 medium-diameter trees survived and were thriving in unmown areas. All 73 seedlings in the smallest category were thriving at unmown sites. Land stewardship strongly influences tree recovery in the study area.

Jiang Q, Liu Y, Sun Y, Ren L, Luo Y (2025) Acoustic detection of forest wood-boring insects under co-infestations. *Insects* 16(12): 1241. https://www.mdpi.com/2075-4450/16/12/1241

Acoustic detection technology has emerged as a promising, non-destructive and continuous monitoring method for pest early detection at the single tree level. However, field application still encounters problems, especially under complex infestation scenarios, i.e., co-infestations by multiple pest species. This study aims to develop a novel acoustic-based recognition model for detecting forest wood-boring pests, specially designed to enhance monitoring accuracy under complex infestation scenarios. We collected feeding vibration signals from four wood-boring pests: *Semanotus bifasciatus*, *Phloeosinus aubei*, *Agrilus planipennis*, and *Streltzoviella insularis*. Three infestation scenarios were designed: single-species, co-infestation without mixed signals, and co-infestation with mixed signals. Three **machine learning (ML) models** (Random Forest, Support Vector Machine, and Artificial Neural Network) based on seven acoustic feature variables, and three deep learning (DL) models (AlexNet, ResNet, and VGG) using spectrograms were employed to classify the signals. Results showed that ML models achieved perfect accuracy (OA: 100%, Kappa: 1) in single-species scenarios but declined significantly under co-infestation scenarios with mixed signals. In contrast, DL models, particularly ResNet, maintained high accuracy (OA: 85.0—88.75%) and effectively discriminated mixed signals. In conclusion, this study demonstrates the **superiority of spectrogram-based DL models for acoustic detection under complex infestation scenarios** and provides a foundation for **developing a general, real-time detection model for integrated pest management in forest ecosystems**.

Kasatkin DG, Meshcheryakova IS (2026) The emerald ash borer *Agrilus planipennis* Fairmaire, 1888 (Coleoptera: Buprestidae) in Rostov Region: Results of four-year monitoring (2022—2025). *Russ J Biol Invasions* 17, 58—68. https://doi.org/10.1134/S2075111725600685

The results of the four-year monitoring (2022–2025) of the emerald ash borer (EAB) *Agrilus planipennis* Fairmaire in the Rostov Region are presented. During this period, the pest widely spread across the region, infesting ash stands in 18 (primarily in the western part) of the region's 43 administrative districts (i.e., 40% of the region's area). As a result, **quarantine phytosanitary zones were established in the region over a total area of 3.186 million hectares**. By the end of 2025, more than 90% of ash trees of three species (*Fraxinus pennsylvanica, F. excelsior,* and *F. ornus*) were damaged significantly in shelterbelts, roadside forest belts, recreational areas, and street plantings; **30 to 60% of the trees were dying, and about 20% were already dead.** The infestation of ash trees varied: 0.1 to 1.9 exit holes per 1 dm^2 of bark surface were recorded on ashes in shelterbelts and from 0.1 to 1.6 per dm^2 in urban landscapes. A

study of 68 model trees in the Neklinovskiy district and in the city of Rostov-on-Don demonstrated no significant differences in the density of exit holes across trunk height from 0 to 2 m. Three cases of tree roots infestation by EAB were documented in park stands in Rostov-on-Don. In the stands under study, mature trees of ***F. pennsylvanica*** **exhibited more intense bark cracking than** ***F. excelsior***—in 90% of cases, the bark appeared trimmed, with significant light-colored areas visible from a distance. In the forest belts of the region, a mass infestation of young shoots with a diameter of 3.18-7.6 cm and epicormic branch with a diameter of 1.75 cm has been detected. **A negative forecast has been given for the plantings of *Fraxinus* spp. in the Rostov Region**.

Land ES, Tull AR, Munro HL, Merkle SA (2026) Clonal propagation of Oregon ash (*Fraxinus latifolia*) via somatic embryogenesis. *Trees* 40, 73. https://doi.org/10.1007/s00468-026-02779-2

Key message: This first account of Oregon ash somatic embryogenesis identifies **unique auxin and abscisic acid responses distinct from green and white ash**, advancing clonal propagation techniques for reforestation.

Oregon ash (*Fraxinus latifolia*), the **only ash species native to the Pacific Northwest**, is vulnerable to the invasive beetle, emerald ash borer (EAB; *Agrilus planipennis*). EAB was first detected in North America in 2002, and subsequently spread primarily east of the Rocky Mountains, with greatest concern centered on more abundant and economically valuable ash species, such as green ash (*Fraxinus pennsylvanica*) and white ash (*Fraxinus americana*). Given the devastating effects of EAB on ash populations and limited natural regeneration capacity of Oregon ash, developing reliable propagation methods is essential for restoration efforts. Thus, our objective was to develop somatic embryogenesis (SE) protocols for Oregon ash by evaluating effects of auxin concentration, explant manipulation, and abscisic acid supplementation on embryogenesis induction, proliferation, and maturation. Embryogenesis induction was influenced by the interaction between picloram concentration and explant cutting ($p = 0.03$), with optimal rates achieved using 0.2 mg/L picloram with intact embryos (16%) or 0.1 mg/L picloram with excised cotyledons (15%). During proliferation, 2,4-D significantly improved culture growth compared to picloram ($p = 0.03$). Genotype also affected Oregon ash proliferation response to varied minute (0.1—10 µM) abscisic acid (ABA) concentrations ($p < 0.01$).Our findings lay the foundation for understanding SE response in Oregon ash and demonstrate the feasibility of clonal propagation for this species, providing essential tools for conservation efforts as EAB threatens Pacific Northwest ash populations.

Mazurchuk H, Puzrina N, Vasylyshyn R et al. (2025) Investigation of ash stands' health condition in emerald ash borer (*Agrilus planipennis* Fairmaire) infestation: Case study in Holosiivskyi District, Kyiv, Ukraine. *Ecological Engineering & Environmental Technology* 26 (12): 288—301. doi:10.12912/27197050/214362 https://www.ecoeet.com/Investigation-of-ash-stands-health-condition-in-emerald-ash-borer-Agrilus-planipennis,214362,0,2.html

The aim of this study is to c**omprehensively assess the health condition of ash stands in Holosiivskyi National Nature Park**, Kyiv, and identify the main biotic and abiotic factors contributing to stand decline, determining damage distribution patterns and the role of individual factors in stand degradation. Field observations were conducted during the peak growing season to ensure accurate assessment of tree health parameters. This research demonstrates the complex interactions between invasive and stem pests, fungal and bacterial pathogens, and abiotic factors in ash stand degradation. Research was conducted in 2023—2024, combining forest pathological surveys, identification sample collection (n>110), stand assessment by health condition classes, and pest monitoring using pheromone and color-based traps with D-shaped exit hole counts. The weighted average health condition index (HCI = 3.82) indicates severe stand damage and high proportions of dying trees. Most studied trees exhibited dead branches and symptoms of decline. Healthy trees (health class I) comprised only 7%, while declining or dead trees (health classes IV–VI) accounted for over 57%. Trees with 48–88 cm diameters showed the highest vulnerability. Stem pest emergence rates were: *Agrilus planipennis* — 1.1 ± 0.2 holes/dm², *Hylesinus crenatus* — 2.7 ± 1.3, *Hylesinus fraxini* — 2.2 ± 1.3. Root rot and epicormic shoots were widespread, indicating intensive stress factor impacts. **The most common damage combination was "rot + stem pests" (4.0 ± 1.72%)**, particularly in roadside stands. Results demonstrate that **critical health conditions result from complex interactions among *A. planipennis*, stem pests, and fungal and bacterial pathogens,** particularly affecting larger-diameter trees.

Mason ME, Carey DW, Romero-Severson J, Knight KS, Poland TM, Koch JL (2026) Select genotypes of white and green ash show heritable, elevated resistance to emerald ash borer. *New Forests* 57, 12 https://doi.org/10.1007/s11056-025-10158-x

The emerald ash borer (*Agrilus planipennis*, EAB) poses an unprecedented threat to North American *Fraxinus* species and has already decimated ash populations in large parts of the natural range in the northeastern US. In some forest stands, a few trees remain alive with healthy crowns years after mortality from EAB has killed the majority of ash trees. These trees, called lingering ash, have been identified, replicated by grafting, and screened for resistance to EAB larvae in controlled greenhouse bioassays. This study showed that the proportion of larvae killed by tree defenses, and the average weight of EAB larvae within the tree differ between different tree genotypes, and that some lingering ash trees perform better than known susceptible trees for these traits. Clonal repeatibility was calculated to estimate broad sense heritability for each trait. Clonal repeatabilities for proportion of tree-killed larvae were 0.15 for green ash selections, 0.45 for white ash selections, and 0.87 for a single green ash family with lingering ash parentage. These results provide additional evidence that **traits associated with EAB resistance in lingering ash have a genetic basis**, the essential requirement for an EAB resistance breeding program.

Mogouong Tambue J, Yager C, Bushley KE (2026) Associations between phloem microbiota and metabolomes in three North American ash species (*Fraxinus* spp.) susceptible to emerald ash borer (*Agrilus planipennis*). *Environmental Microbiome* 21: 66. https://doi.org/10.1186/s40793-026-00884-w

Microorganisms play crucial roles in the survival and fitness of their plant and insects hosts, including invasive species. The emerald ash borer (*Agrilus planipennis*, Fairmaire; EAB) is an invasive insect from Asia. It represents a significant threat to North American forest ecosystems, causing widespread mortality in susceptible native ash (*Fraxinus*) species. While previous studies have shown differences in specific plant defense metabolites between susceptible North American ash species and their more resistant Asian counterparts, widely targeted metabolite profiles and their interactions with phloem microbiota in response to EAB infestation has thus far received little attention. **This study aimed to profile microbial communities associated with ash phloem and EAB larval guts and their relationship to ash phloem metabolites** in three native susceptible North American ash species: *F. pennsylvanica* (green ash), *F. nigra* (black ash) and *F. americana* (white ash).

Using metabarcoding to characterize the microbial communities associated with the larval gut and host tree phloem and widely targeted metabolomics to establish the first global metabolomic profile of phloem in these ash species, we examined interspecies differences in profiles and associations of ash phloem microbiota and metabolites in relation to EAB infestation. Multivariate analysis revealed that **fungal communities were distinct in all ash species**, while ***F. pennsylvanica* (green ash) harbored bacterial communities distinct from black ash**. **Only black ash showed a phloem profile significantly associated with EAB attack symptoms** and had the largest number of differentially abundant bacterial taxa. In contrast, **larval gut bacterial communities from green ash were distinct from those in other ash species**. Green ash displayed a distinct global metabolite profile from the other two species and had the highest number of differentially regulated metabolites, while black ash had the least. Green and white ash shared a strong upregulation of terpenoid compounds, several of which were among compounds significantly associated with microbial communities in green ash phloem or the EAB larval gut.

Our results provide the first **comparative analysis of phloem-associated microbial communities and metabolomes** across three susceptible North American ash species and their response to EAB. We found that **microbiota and metabolites in green ash showed a distinct response to EAB infestation from the other ash species** and we identified **specific metabolites exhibiting significant correlations with microbial communities in ash phloem or the EAB larval gut**. These findings contribute novel insights into interspecies variability in host-associated microbial communities and metabolomes and their response to an invasive insect.

Ni G, Gotell N, Duan J (2026) Effects of microhabitats and seasonal conditions on the supercooling points of *Tetrastichus planipennisi* (Hymenoptera: Eulophidae) in Vermont, USA. *BioControl*. https://doi.org/10.1007/s10526-026-10382-0

Arthropod **natural enemies** such as *Tetrastichus planipennisi* Yang (Hymenoptera: Eulophidae) face novel environments when introduced to non-native ranges for

classical biocontrol. Their ability to adapt to novel thermal regimes may determine their success in establishment. ***T. planipennisi* was introduced to the USA in 2007 for classical biological control** of the invasive emerald ash borer **Agrilus planipennis** Fairmaire (Coleoptera: Buprestidae). Previous studies found that *T. planipennisi* is **chill-susceptible** and its **establishment is affected by winter mortality at higher latitudes**. We conducted a **field experiment** during winter of 2021—2022 in Jericho Research Forest, Vermont, USA, to determine if the temperature at which spontaneous freezing occurs, known as the **supercooling point** (SCP), of *T. planipennisi* larvae changes in response to microhabitat manipulations of ambient temperature, and we measured eclosion. Larvae were placed under control conditions or artificial shelters that reduced temperature extremes. **Larvae in control groups had significantly lower SCP values in January, February, and March compared to those in artificial shelters**, with **mean SCP values in control-group larvae 2.52 °C lower in January, 1.70 °C lower in February, 1.98 °C lower in March, and higher eclosion success (median 18% in controls)**. SCP values were negatively correlated with monthly cooling rate and higher in shelter treatments, and degree-hours ≤ −2 °C best predicted eclosion. These findings demonstrate **significant inter-individual variation in SCP in response to shifts in local habitat temperatures**. Microclimatic variation may play a role in determining insect SCP capacity and emergence, particularly in northern regions with extreme winter conditions.

Oten KLF, Duan JJ, Johnson CL (2006) Seeking the unseen: a review of host-finding strategies of parasitoids attacking wood-boring beetles. *Annals of the Entomological Society of America* 119 (3): 93—107. https://doi.org/10.1093/aesa/saag010

The success of **biological control** of insect pests by **parasitoids** ultimately depends on effective host foraging by the agents, which involves multiple processes and various cues associated with hosts' habitat, host-associated symbionts and other microbial organisms, and/or hosts themselves. In general, **parasitoid interactions with concealed hosts such as wood-boring beetles** differ significantly from those that attack exposed hosts (eg surface-feeding caterpillars, aphids) as they must rely on a more complex hierarchy of cues to first locate hosts' microhabitats and then hosts for their reproduction. These differences influence the parasitoid's host-finding strategies, specificity, and their efficacy in suppressing their host populations. Here, we **review the major steps in host finding** by parasitoids of wood-boring beetles and synthesize current knowledge on the chemical, vibrational, visual, and other cues that mediate each stage of the process. We highlight how these cues operate across different spatial scales, interact with parasitoid morphology and behavior, and shape the success of biological control programs targeting economically important wood-boring pests. Finally, we identify **key knowledges gaps** and point to some future research directions aimed at improving the selection, deployment, and monitoring of parasitoid biological control agents in forest ecosystems.

Rizzo D, Pecori F, Gionni A. et al. (2006) Novel *Agrilus planipennis* (Coleoptera: Buprestidae) early-detection tool designed on cytochrome B gene. *J Plant Dis Prot* 133, 101. https://doi.org/10.1007/s41348-026-01286-3

> *Agrilus planipennis* (Coleoptera: Buprestidae) is a quarantine pest that is threatening native ash populations in both North America and Europe. **Early detection** of this pest, which can cause severe infestations, is essential, and **molecular tests** applied at different developmental stages and environmental traces can contribute substantially to improving control measures to prevent or contain *A. planipennis* infestations. In this study, **a specific *A. planipennis* real-time qPCR assay was developed using a Locked Nucleic Acid (LNA) probe based on the CytB (cytochrome B) gene**. The detection limit of this method was 25.6 fg/µl for adult DNA extracts and 0.21 pg/µl for frass produced by *A. planipennis* larvae. **The new qPCR probe test, which targets a different locus**, not only **allows identification of the pest and provides an indirect diagnosis through environmental DNA analysis** but can also be used for cross-validation of results between different tests.

Ryss AY, Kazi IM, Seliuk AO, Selikhovkin AV (2025) Host specificity tests of xylobiont nematodes from ash trees to fungi from vector beetles. In: *Proceedings of the Congress of Symbiotic Systems Researchers* (ed by Gordeev II), 06—11 October 2025. P. 297. DOI: 10.61726/7635.2025.82.30.001. pdf

> Tree diseases cause a damage to forest and park plantations. Their pathogens – fungi, nematodes and their insect vectors - need regular monitoring of their expansion due to climate warming and flows of infested wood materials. The etiology of epiphytotic diseases is unclear due to complex relationships in the 'vector-fungus-nematode' system. The objective was to evaluate the suitability of entomochore fungi as a food substrate for nematodes inhabiting beetle galleries in diseased trees. An cultural isolate of *Laimaphelenchus heidelbergi* (Aphelenchoididae) from the galleries of *Agrilus planipennis* (AGRLPL) in *Fraxinus pennsylvanica* was used as the test phyto-mycophagous nematode. *Botrytis cinerea* (BC) was used as a control feed fungus. The other test fungi (identified by ITS and 18S rRNA) were: *Alternaria tenuissima* AT; *Hymenoscyphus fraxineus* (CHAAFR); *Bjerkandera adusta* (BA), *Leptographium piceardum* (LP); *Sydowia polyspora* (SYDOPO); *Geosmithia morbida* (GEOHMO); *Trichoderma* sp. (TS). The tests were conducted during 21 days at 25°C, with the inoculum of 200 nematodes. The highest final nematode abundances were detected for BC (control), AT, BA; medium quantities for LP, CHAAFR, SYDOPO, and the lowest abundances for GEOHMO and TS. Results indicated the **successful trophic relationships between nematodes and fungi vectored by beetles**. *Trichoderma* spp., as potential agents of biological control, can also serve as the poor feed substrates for nematodes. Nematodes of the genus *Laimaphelenchus* have been propagated in vitro for the first time and have shown to be polyphagous to entomochoric fungi. *Laimaphelenchus penardi* and *L. heidelbergi* were obligatory associated with the infested ash trees in St. Petersburg.

Schrewe F, Morgenstern K, Wagner S (2026) Assessing the role of mixed tree species in mitigating ash dieback insights from greenhouse experiments. *Forest Pathology* 56 (3): e70088. https://doi.org10.1111efp.70088

Since its introduction, **ash dieback** has been a disease affecting ash (*Fraxinus excelsior*) stands across nearly their entire range. As **the disease cannot be contained**, various options for **mitigating its severity** have been explored in numerous studies. It has frequently been proposed that ash, particularly in dense pure stands, is more severely impacted by the disease. Additionally, it has been claimed that the presence of mixed tree species might have a species-specific effect in mitigating disease progression. **To investigate the impact of admixed tree species, we conducted greenhouse experiments** in which ash trees were grown under varying quantities of infected ash and mixed tree species leaf litter. The objective was to assess the effect of admixed tree species based on pathogen spore production and the assessment of disease symptoms. The mixed tree species used in the experiments were beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*) and winter lime (*Tilia cordata*). Spore production from the infected leaf litter in the greenhouse cabins followed patterns broadly consistent with previous field observations. We demonstrated that **spore pressure in the cabins depended on the applied quantity of infected ash leaf litter** and that **the mixed tree species exerted no further influence**. The number of infected shoots on an ash tree correlated with both its total number of shoots and the quantity of infected ash leaf litter. The number of shoots was considered an indicator for leaf area and thus the tree's potential to become infected. For stem necroses, only the quantity of infected ash leaf litter was found to be decisive. We conclude that **the milder progression of ash dieback in mixed stands is primarily due to a dilution effect caused by the presence of mixed tree species. No additional effects of the three mixed tree species on spore production or disease progression were observed** in our study.

Singh P, MacQuarrie CJK, Smith SM (2026) A novel bioassay to assess the non-target impacts of insecticide exposure on a larval endoparasitoid of the emerald ash borer. *Journal of Economic Entomology* 119 (2): 1150—1162. https://doi.org/10.1093/jee/

Pest management strategies for invasive species like the emerald ash borer (EAB) must **combine chemical control with biological control agents** to protect vulnerable hosts. When used in tandem with biological control agents, however, systemic insecticides may impact the fitness of biological control agents, thus reducing their effectiveness. Systemic insecticides are used for EAB management in urban forests across North America, while classical biocontrol with introduced natural enemies has been an important tactic for managing EAB in natural forests in North America. We tested the **non-target effects of azadirachtin on *Tetrastichus planipennisi* Yang**, a larval parasitoid of EAB introduced to North America. **A novel bioassay protocol** was developed whereby EAB larvae were initially reared on host material in the laboratory and then temporarily transferred to an artificial EAB diet containing azadirachtin followed by exposure to parasitism by *T. planipennisi*. **Exposure to azadirachtin at concentrations causing 30% and 50% mortality in EAB larvae reduced EAB larval parasitism by *T. planipennisi*.** Exposure to azadirachtin also reduced *T. planipennisi*'s sex ratio, adult emergence, female body size, potential fecundity, and adult longevity.

These results suggest there are **negative interactions between systemic insecticides and EAB biological control agents**, which present challenges for the integration of tactics for long-term EAB management.

Sukholozov EA, Stelmakh KN (2026) Comparative analysis of damaged ash stands by *Agrilus planipennis* Fairmaire, 1888 (Coleoptera: Buprestidae) in Penza. *Phytosanitary. Plant Quarantine* 2 (27): 44—53. https://phytosanitary.vniikr.ru/jour/article/view/233/355

In 2024, a dangerous invasive pest was detected for the first time in Penza Oblast [Russia] — emerald ash borer *Agrilus planipennis* Fairmaire, 1888. The aim of this study was **to assess the sanitary condition and compare the susceptibility of various types of ash stands in Penza**. The study was conducted in 2025 in 27 stands, divided into three categories: residential plantings, roadside strips, and public gardens. A total of 354 green ash trees (*Fraxinus pennsylvanica* Marshall) were inspected. A sanitary category was determined for each tree, a weighted average sanitary condition category was calculated for each stand, and the resulting data were processed using parametric and nonparametric statistical methods. It was found that the sanitary condition of urban stands ranged from weakened to dying. **No statistically significant differences in the damage degree were detected between residential, roadside, and public garden plantings**, suggesting a uniform infestation of all urban stand types. **No presence of the emerald ash borer was detected in natural forests of Penza Oblast** during forest pathology monitoring; however, the risk of its introduction from roadside shelterbelts is noted. Species of **Braconidae**, which are considered potential biological control agents, were recorded on affected trees. The obtained data show the high degree of threat to ash stands in the region and the need for further monitoring.

Tayal A, Perry KI (2026) Status of ash (*Fraxinus* spp.) in mixed hardwood post-outbreak forests near the epicentre of the emerald ash borer invasion. *Agricultural and Forest Entomology* 1—12. Available from: https://doi.org/10.1111/afe.70067

Emerald ash borer (EAB; *Agrilus planipennis* Fairmaire) has caused mortality of hundreds of millions of ash (*Fraxinus* spp.), leaving an 'orphaned' cohort of immature ash seedlings and saplings in forests. As immature ash grow and become susceptible to EAB, their long-term persistence in natural forests is unknown. **This study leveraged long-term research sites established during the early stages of ash mortality** near the epicentre of invasion to investigate the extent and severity of ash loss after two decades with a focus on the regenerating cohort of ash. We found ash remained abundant in the understory of post-outbreak forests, but their abundance and size class varied based on soil hydrology, with higher densities of larger, susceptible ash in wetland forests than in upland and riparian forests. While **many ash of susceptible size (≥2.5 cm dbh) showed symptoms consistent with EAB infestation**, **the majority of larger ash (≥5 cm dbh) had healthy canopies**. We found that **silver maple (*Acer saccharinum*) has become dominant** in the overstory in wetland forests and that populations of **tamarack (*Larix laricina*) were associated with black ash regeneration**. These findings suggest **ash regeneration has occurred differently among forest habitats**. Ash in wetland forests have responded quickly to changes

following EAB-induced ash mortality and are closer to reaching the sizes required to become reproductively mature. However, **EAB populations are present in low densities**, and the persistence of ash in natural forests will depend on improved ash recruitment and the efficacy of introduced natural enemies.

Tsybulskyi O, Bonyuk Z, Chumak P (2025) Species and varieties of ash trees are promising for greening in megapolies under the conditions of the emerald ash borer (*Agrilus planipennis*: Coleoptera, Buprestidae)invasion in Ukraine. *Sci. Bull. Uzhhorod Univ.* (*Ser. Biol.*). 59: 78-82. https://journals.uzhnu.uz.ua/index.php/biology/article/view/1520/1596

The aim of the research was **to identify species and varieties of ash trees** (*Fraxinus*, *Oleaceae*) **resistant to damage by the emerald ash borer** (*Agrilus planipennis* Fairmaire = EAB). Damage by the borer's larvae can lead to complete drying of the tree within 2–3 years. The rapid spread of this invasive pest in Ukraine threatens the cultivation of ash trees in parks, botanical gardens, and forest park areas. Monitoring the phytosanitary condition of ash plantations using pheromone and colored sticky traps and visual inspection of plants are the most effective means of timely detection of borer outbreaks. It is believed that the most effective way to combat the pest is to cut down and remove damaged trees, especially in big cities, where the use of pesticides by spraying plants is impossible. In 2024–2025, more than 120 trees were examined in the Botanical Garden named after Acad. O.V. Fomin and **species and varieties of ash trees that were not damaged by the pest were previously identified. These are *F. excelsior* var. *aureovariegata* Weston, *F. excelsior* L. 'Crispa', 'Heterophylla', 'Pendula', 'Nana'; *F. chinensis* subsp. *rhynchophylla* (Hance) A.E. Murray, *F. sogdiana* Bunge and *F. pallisae* Willmott, *F. latifolia* Benth., *F. ornus* L. The susceptibility to the EAB was not confirmed for *F. angustifolia* subsp. *oxycarpa* (M. Bieb. ex Willd.) Franco & Rocha Afonso. The following were clearly damaged by the EAB: *F. pennsylvanica* Marshall, *F. profunda* (Bush) Bush, *F. angustifolia* subsp. *syriaca* (Boiss) Yalt.** As **a temporary solution to replace damaged trees**, it has been proposed to cut them down to the stump. After such a procedure, ash trees produce lush root growth, which by the age of 15–20 does not have thick enough bark and bast for the development of the goldenrod larva. Our data can be considered preliminary for the scientific and practical search for ash species and varieties resistant to EAB damage.

VKM, Krokene P, Alsanius B, Børve J, Flø D, Magnusson C, Nicolaisen M, Line N et al. (2026). Risk ranking and prioritization of plant pests for Norway. Progress report nr. 1. Scientific Opinion of the Panel on Plant Health of the Norwegian Scientific Committee for Food and Environment. *VKM Bulletin* 02. https://vkm.no/english/riskassessments/allpublications/riskrankingplantpestsassessmentfindslowoverallrisk.4.5f5d6e1c19c1e6691c85d8f.html

EPPO-listed plant pests were assessed and ranked according to the overall risk they pose to Norwegian plant health. Based on probability of entry, probability of establishment (including spread), and potential impact on plant health, pests were classified into five risk classes: very high, high, moderate, low, and very low risk. In this first progress report VKM has assessed 61 pests: 24 fungi, 12, nematodes, 11

insects, eight viruses, and six bacteria. None of these were assessed to pose very high risk, while one pest (*Fusarium euwallaceae*) was assessed to pose high risk. Six pests were assessed to pose moderate risk: *Dendroctonus ponderosae*, *Tuta absoluta*, *Phymatotrichopsis omnivora*, *Verticillium dahliae* hop strains, *Xanthomonas euvesicatoria* pv. *euvesicatoria*, and *Xanthomonas euvesicatoria* pv. *perforans*. The remaining pests were assessed to pose low risk (16 pests) or very low risk (38 pests) to Norwegian plant health. ***Agrilus bilineatus*** **(EPPO A2) and** ***Agrilus mali*** **(EPPO A2) pose very low risk,** ***Agrilus fleischeri*** **(EPPO A2) — low risk**. *Agrilus planipennis* was not included into the first report and will be assed later.

Vovkotrub OM, Krivosheev SP (2026) Quarantine Coleoptera pests of the genus *Agrilus* spp. *Quarantine and Plant Protection* 284 (1): 15—22. https://doi.org/10.36495/2312-0614.2026.1.15-22

Goal. To characterize the morphological and biological features of quarantine species of the genus Agrilus spp. and to determine the risks of their invasion in the European and Mediterranean Plant Protection Organization (EPPO) member countries and in Ukraine, by analogy with the emerald ash borer (*Agrilus planipennis* F.). **Methods.** Analysis of official data from the State Service of Ukraine on Food Safety and Consumer Protection and other official sources, including EPPO, using a bibliographic method. **Results.** The morphological and biological features of quarantine species of the genus *Agrilus* spp. were analyzed, including the presence of their host plants in the territories of EPPO member countries and Ukraine. The suitability of climatic conditions and the probability of acclimatization and spread of the pest in these territories were also investigated. **Conclusion.** A comparative analysis of the developmental characteristics of quarantine species of the genus *Agrilus* spp. and their environmental requirements indicates **a high probability of acclimatization and adaptation in the territories of EPPO member countries, particularly in Ukraine**. In the event of the introduction of these phytophagous insects into new territories, by analogy with *A. planipennis* F., significant economic losses of host plants are expected due to damage caused by quarantine species of the genus *Agrilus* spp., as well as complications in control measures due to their concealed lifestyle.

Wotherspoon AR, Nolin AF, Siegert NW, Dech JP, Tardif JC et al. (2026) A perspective on black ash decline in eastern North America: ecological insights, cultural importance, and urgent research needs. *Environmental Reviews* **34**: 1—11. https://doi.org/10.1139/er-2025-0198

Black ash (*Fraxinus nigra* Marsh.) is a keystone species of wetlands and riparian ecosystems across northeastern North America. It is also culturally significant to Indigenous communities whose practices, livelihoods, and spiritual traditions are connected to the species. Today, black ash is threatened by compounding threats from climate change and the exotic emerald ash borer pest (*Agrilus planipennis* Fairmaire), which has caused extensive mortality across its range. The loss of black ash carries profound ecological and cultural consequences ranging from altered water balance of unique wetland habitats to the loss of centuries-old basket-making traditions. From this perspective, **we assess the ecological role, cultural importance, and**

management responses associated with the decline of black ash. We synthesize evidence on its vulnerability to the emerald ash borer, explore emerging conservation strategies to support its persistence, and outline approaches to its potential restoration. Underlining these themes, we consider **the importance of integrating Indigenous Knowledge systems with Western science to guide decision-making and ensure cultural continuity**. Looking forward, we argue for a renewed research agenda centered on ecological monitoring, scenario planning, and collaborative governance. Advances in remote sensing, climate-envelope modeling, and genetic conservation provide promising tools to design adaptive management strategies to suit a changing environment for this species. Equally critical is the recognition of Indigenous-led initiatives, which should protect black ash for cultural use but also provide models for co-management founded in resilience and reciprocity. By highlighting these ecological, cultural, and social dimensions of black ash decline, this perspective calls for urgent, coordinated action while a critical window of opportunity remains for effective conservation of black ash.

Zviagintsev VB, Kirichenko NI, Usenia VV, Pomaz GM, Chernik MI, Seraya LG, Baranchikov YN (2025) *Agrilus planipennis* Fairmaire (Coleoptera, Buprestidae) in Belarus: Possible vectors of invasion and prospects for the spread of the quarantine species. In: Storozhenko VG, Zvyagintsev VB, Yarmolovich VA (eds.). *Problems of Forest Phytopathology and Mycology*. Proceedings of the 12th International Scientific and Practical Conference, Belarusian State Technological University, Minsk, Belarus, 13—17 October 2025. 290 pp. P. 78—83.

The emerald ash borer, *Agrilus planipennis* Fairmaire, 1888 (Coleoptera: Buprestidae), is a harmful East Asian insect pest damaging ash trees *Fraxinus* spp. Over the past three decades, it has invaded European part of Russia and Ukraine, causing widespread mortality of ash trees in both urban and natural ecosystems. Here, we report **first occurrence of this devastating pest in Belarus**, specifically in the city of Gomel. Given the proximity of infested regions in neighboring countries – specifically Bryansk (243 km away from Gomel) and Smolensk (270 km) in Russia, as well as Kiev (220 km) in Ukraine — **it is suspected that the buprestid was accidentally introduced from some of these localities rather than expanding its range by itself**. Urgent research is required to delineate the extent of its spread within Belarus. Moreover, decisive actions must be taken promptly to suppress current infestation foci and prevent further distribution of this highly aggressive alien pest.