Monitoring of the Emerald Ash Borer (Agrilus planipennis)

DSLPP "Kharkivlisozakhyst"

In September 2019, specialists from DSLPP "Kharkivlisozakhyst" conducted a forest pathology survey in Markivske Forestry, State Enterprise "Bilovodske LMG," compartment 11, section 15, covering an area of 0.9 hectares, categorized as a nature reserve. The quarantine pest—the emerald ash borer (Agrilus planipennis)—was detected (Act dated September 19, 2019), and recommendations were provided for its eradication.

On October 22, 2019, a commission consisting of employees from DSLPP "Kharkivlisozakhyst" and the Forest Protection Laboratory of UkrNDILGA named after G.M. Vysotsky, in the presence of representatives of the local council, conducted a special inspection of the forest shelterbelts of the Heraskivka Village Council, Markivskyi District, Luhansk Oblast.

The inspection was conducted based on a request from the village head (letter dated October 16, 2019, No. 02.15-374) and a letter from the Markivka District State Administration (dated September 19, 2019, No. 193/02-14) regarding the adoption of comprehensive measures for the immediate eradication of the pest outbreak—specifically, the emerald ash borer—identified by specialists from the Main Directorate of the State Service of Ukraine on Food Safety and Consumer Protection in Luhansk Oblast (submission dated September 13, 2019, No. 01-11/3759).

During the detailed forest pathology survey, approximately 200 trees (covering an area of up to 0.5 hectares) in natural regeneration (self-seeding, aged 3-7 years) were found to have significant trunk damage caused by the dangerous quarantine pest—the emerald ash borer (Agrilus planipennis). When placing sample pallets (10×10 cm) on trunks and branches, larvae at various developmental stages were discovered in larval galleries and embedded in the wood, with densities ranging from 1 to 3 individuals per 1 dm^2, primarily on the southern side of the trunk, indicating infestation between 2017 and 2019.

It was established that the emerald ash borer infests not only the main trunk but also the basal part and thin branches. In addition to this pest, the spread of ash bark beetles (Hylesinus sp.) was also recorded in the plantation.

It is known that the emerald ash borer is an aggressive trunk pest capable of infesting trees without visible signs of weakening, accelerating their decline. Under high-density infestations, tree mortality occurs in the second year, but chronic pest centers may also form and persist for extended periods. Large trees can be gradually colonized over several years, leading to their progressive weakening.

The examination of adjacent protective forest plantations also revealed 40-50-year-old ash trees with damage caused by the emerald ash borer, located 50-70 km west of Heraskivka, Luhansk Oblast.

From the initial site where signs of ash infestation were first detected, specialists from UkrNDILGA and DSLPP "Kharkivlisozakhyst" conducted a survey of protective and roadside forest strips along the route: Rudkivka – Heraskivka – Markivka – Lisna Polyana – Skorodna – Markivske – Sychanske – Karavan-Solodky – Lozove (in Markivskyi and Starobilskyi districts). The survey confirmed the infestation of over 300 ash trees by the quarantine pest.

As a result of the surveys, a quarantine regime was established in the Starokozhivske tract of Markivske Forestry, State Enterprise "Bilovodske LMG," as well as in the adjacent shelterbelt areas of the Heraskivka Village Council, Markivskyi District, Luhansk Oblast, covering an area of 5.0 hectares.

From May 19 to May 22, 2020, during a forest pathology survey conducted by specialists of DSLPP "Kharkivlisozakhyst" in the plantations of State Enterprise "Starobilsk LMG," the spread of the dangerous quarantine pest, the emerald ash borer (*Agrilus planipennis*), was recorded. At the time of the survey, the total affected area required further clarification.

In June 2020, specialists from the State Specialized Forest Protection Enterprise "Kharkivlisozakhyst," together with experts from the Forest Protection Laboratory of UkrNDILGA and representatives of State Enterprise "Starobilsk LMG," conducted a forest pathology survey of forest plantations and shelterbelts to determine the spread of the emerald ash borer and study its phenology in the new region.

During the examination of model trees infested by the borer, it was determined that dieback begins in the upper part of the crown and gradually spreads downward. Water sprouts appear on the trunks, and root suckers emerge at the base. Increased adult beetle activity was observed on the southern side of the shelterbelts. No dead trees were found during the survey, but crown damage caused by additional beetle feeding reached 25–75%. Under the bark, larval galleries containing young and mature larvae, as well as pupae, were discovered. This indicated that the beetle flight period would last for about a month. Characteristic D-shaped exit holes were found on the trunks and branches of more than half of the surveyed trees, confirming that infestation had occurred at least in the previous year.

A quarantine regime was introduced over an area of 233.9 hectares in the Troitske, Bilokurakyne, and Novopskov districts of Luhansk Oblast.

On July 10, 2020, specialists from DSLPP "Kharkivlisozakhyst" compiled a preliminary act of forest pathology surveys of deciduous plantations to determine the presence of the emerald ash borer. The surveys were conducted from July 6 to July 9, 2020, in the plantations of Bilolutsk, Novobilsk, Novopskov, and Starobilsk forestries of State Enterprise "Starobilsk LMG."

Throughout 2020, specialists from DSLPP "Kharkivlisozakhyst" conducted forest pathology surveys to detect *Agrilus planipennis* over an area of 388.9 hectares, including:

- **150.0 hectares** in State Enterprise "Starobilsk LMG"
- **88.9 hectares** in State Enterprise "Svatove LMG"
- **150.0 hectares** in State Enterprise "Bilokurakyne LMG"

The total affected area was **432.0 hectares**.

On **September 16, 2021**, in State Enterprise "Kupianske LG" (Kharkiv Regional Forestry Administration), specialists from DSLPP "Kharkivlisozakhyst" detected **massive infestations** of the emerald ash borer (*Agrilus planipennis*) in a shelterbelt at coordinates **49.982252, 37.846687**, affecting **green ash (Pennsylvanian ash) trees**. When placing monitoring pallets, mature larvae embedded in the wood were found at a density of **2 to 3 individuals per 1 dm^2**, mainly on the southern side of the trunk, indicating infestation in **2019-2020**. It was determined that *Agrilus planipennis* infests **not only the main trunk but also the base and thin branches**. In the surveyed shelterbelt, nearly **100% of the green ash trees** were damaged by the pest.

To determine the **boundaries of the infestation**, additional surveys of adjacent ash tree plantations were conducted.

- **In National Nature Park "Dvorichansky" (Compartment 15, Section 1, Coordinates: 50.001466, 37.861683)**, larvae of the emerald ash borer were found on both **common ash**

and green ash trees, with densities of **1 to 2 larvae per monitoring pallet**. Estimated infestation year: **2020**.

- **In Kamianske Forestry, State Enterprise "Kupianske LG" (Compartment 84, Section 4, Coordinates: 50.014412, 37.855415)**, *Agrilus planipennis* was detected on **common ash** trees, with **1-2 larvae per pallet**. Based on characteristic signs, the infestation **occurred in the current year**. Additionally, some common ash trees showed signs of **large ash bark beetle infestation**.

According to forestry data, **Kamianske Forestry covers 2,154.7 hectares**, with ash trees present in its composition.

Further infestations of **green ash trees** by *Agrilus planipennis* were identified **along the T-2109 highway between Zakhidne village and the town of Dvorichna** (coordinates **49.829634, 37.646979**).

2022-2024: *Agrilus planipennis* detections in Kyiv and Kharkiv Oblasts

Since **2022**, reports of *Agrilus planipennis* infestations have emerged from **parks and squares in Kyiv**, including:

- **Park DSHK**
- **Festival Park**
- **Square on Bratislavska St., 38**
- **Trukhaniv Island**
- **M.M. Hryshko National Botanical Garden**
- **Solomianske Cemetery**
- **Squares No. 1-3 on Kontraktova Square (total area: 1.61 ha)**
- **Kurenivsky Park (8.06 ha)**
- **Holosiivsky Park named after M.T. Rylsky (140.9 ha)**
- **Recreational park on Teremkivska St., 2A-6 (4.241 ha)**
- **Square on Ivana Fedorova St. (0.87 ha)**
- **Square on Jerzy Giedroyc St. (0.1498 ha)**
- **Squares at:**
    - **Petro Hryhorenko Ave., 36-38 (0.3 ha)**
    - **Revutskoho St., 42-46 (1.5 ha)**
    - **Park "Partyzanska Slava" (94.98 ha)**
- **Botanical Garden of the National University of Life and Environmental Sciences of Ukraine (53.0 ha)**
- **Squares at:**
    - **Stepan Bandera Ave., 26V-28 (1.6 ha)**

    - **Yordanska St., 26 (0.77 ha)**
    - **Volodymyr Ivasyuk Ave., 65 (0.58 ha)**
- **Ichthyological-Botanical Nature Reserve "Ozero Verbne" (31.00 ha)**

These reports are based on data from the **State Service of Ukraine on Food Safety and Consumer Protection** (dpss.gov.ua) and **scientists from UkrNDILGA**.

Additionally, *Agrilus planipennis* infestations were detected in **Kharkiv Oblast**, specifically in **Bohodukhivskyi and Valkivskyi districts**.

Currently, the emerald ash borer (*Agrilus planipennis*) has been recorded in **three regions of Ukraine**.

Due to **ongoing military actions**, it is difficult to survey areas where hostilities are taking place (or have taken place) or that are **temporarily occupied**, making it impossible to determine the **actual extent of its spread**. Additionally, it is presumed that the pest is capable of **spreading not only in parks and forests but also in shelterbelts, roadside strips, and self-seeded growth areas**.

Control Measures for *Agrilus planipennis*

According to the **European and Mediterranean Plant Protection Organization (EPPO)** (pra.eppo.int), the following methods are used to control the spread of the emerald ash borer in **North America** and could be applied in urban environments:

- **Soil-applied or foliar insecticides**
- **Trunk injection treatments**
- **Basal bark treatments**
- **Protective coatings applied using aerosol equipment** (e.g., **GARD-MN, Stihl**) to the trunk, main branches, and leaves to **eliminate adult beetles and young larvae** (EPPO pest risk analysis).

Additionally, the use of **fungus-based biological insecticides** has been proposed for tree treatment, in accordance with **Ukrainian regulations on green space maintenance** (Order No. 105, April 10, 2006, **Section 11.3**).

Tree Pruning as a Preservation Method

To **prolong the lifespan of weakened or severely damaged trees** in urban areas, **crown pruning** of **1/3 to 2/3** of the tree's height is recommended, depending on the severity of dieback. Studies have shown that some trees can **partially restore their crowns**, while older beetle galleries (from larvae and adult beetles) eventually **heal over**.

(Source: *Newsletter of the EPPO Network of Experts on Surveillance, Monitoring, and Control of the Emerald Ash Borer, Agrilus planipennis.* **PARIS, 2024-06, No. 5**).