Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg

Invasive and quarantine pests

Urban Trees and Forests
Wednesday, 08.03.2023

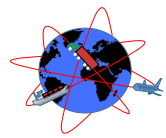
Lisa Thomas

Outline

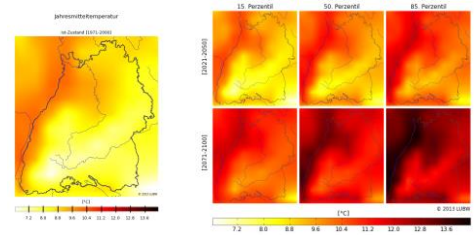
Globalisation & global trade

new pathways for introduction

→ timber trade, parasites on plants / animals, seed contaminant, hitchhikers on ships / planes / vehicles…



Climate Change



https://www.lubw.baden-wuerttemberg.de/klimawandel-und-anpassung/klimakarten-bw

Definitions

- **Alien species** = a species, subspecies or lower taxon, introduced outside its natural past or present distribution.
- **Invasive alien species** = species that are initially transported through human action outside of their natural range across ecological barriers, and that then survive, reproduce and spread, and that have negative impacts on the ecology of their new location and / or serious economic and social consequences.

(Convention on Biological Diversity)

CBD

Definitions

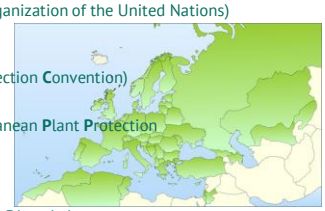
Invasive forets pests:

- highly competitive
- able to establish
- unadapted host
- eradication of hosts

e.g. ash dieback

plant protection organizations

- **FAO:** (Food and Agriculture Organization of the United Nations)
  - Secretariat of IPPC
- **IPPC:** (**I**nternational **P**lant **P**rotection **C**onvention)
- **EPPO:** (**E**uropean and Mediterranean **P**lant **P**rotection **O**rganization)
  →PRA, Alert-Lists
- **CBD:** (**C**onvention on **B**iological **D**iversity)



Pest Risk Analysis

- is the organism a pest?
- what is the likelihood of the entry and establishment?
- Might the pest have an unacceptable (economic, environmental, social) impact?
- If so, what ca be done to avoid/inhibit unacceptable impacts?

EPPO – Global Database

- A1 List: pests are absent from the EPPO region
- A2 List: pests are locally present in the EPPO region
- Alert List: possibly presenting a risk, achieve early warning

→ **pests recommended for regulation as quarantine pests**

Regulated pests

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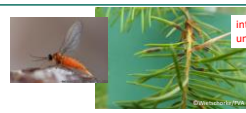
- **Union quarantine pests:** Not present at all in the Union territory or, if present, just locally and under official control
- **Protected zone quarantine pests:** Present in most parts of the Union, but still known to be absent in so-called 'protected zones'.
- **Regulated non-quarantine pests:** Widely present in the EU territory but plant reproductive material on the market should be guaranteed free or almost free from the pests since they can have a serious impact on the quality and economic value of many agricultural crops as well as forestry and fruit plants.

Some examples

Status: Present, only in parts of the area:



©Weihenstephan/PPVA

Protected zone quarantine pests

Regulated non-quarantine pest

©EPPO

What is a Union Quarantine Pest?

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- A pest absent from the EU, or present, but under control
- Organism causes serious damage to plants and plant products
- Its establishment in the EU would have unacceptable economic, environmental and social impacts
- > 200 pests

European Commission

Priority Pests

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- Quarantine pests that are identified as top priorities for EU Member States
- 20 pests on the European Commission's list
- Extra requirements for these pests:
  - Annual surveys
  - Contingency plan
  - Simulation exercises
  - Action plan
  - More information to the public

Phytosanitary Regulations

- Regulation **(EU) 2016/2031** of the European Parliament and the Council
- **Commission Implementing Regulation (EU) 2019/2072:** establishment of uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council

European Commission

Priority Pests

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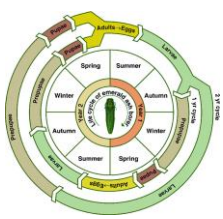
Agrilus planipennis – Emerald Ash Borer

©Peter/FVA

Agrilus planipennis – Emerald Ash Borer



New Phytologist, Volume: 208, Issue: 1, Pages: 63-79,
First published: 13 August 2015, DOI: (10.1111/nph.13604)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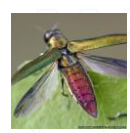


Agrilus planipennis – Emerald Ash Borer

Symptoms:

- frass-filled, S-shaped larval galleries in the cambium
- D-shaped adult exit holes
- yellowing and thinning of foliage
- death of branches
- dieback and tree mortality

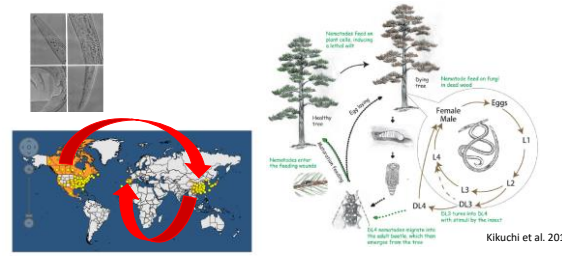
PEST SURVEY CARD

APPROVED: 20 October 2020
doi:10.2903/sp.efsa.2020.EN-1945

Pest survey card on *Agrilus planipennis*

European Food Safety Authority (EFSA),
Jan Schans, Gritta Schrader, Alice Delbianco, Ignazio Graziosi, Sybren Vos

Bursaphelenchus xylophilus – Pine wood Nematode



Kikuchi et al. 2014

Bursaphelenchus xylophilus – Pine wood Nematode

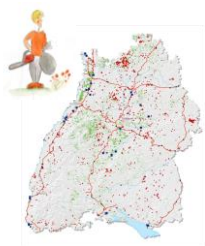
https://commons.wikimedia.org/wiki/File:Monochamus_sartor_%28ABS72744TB529.jpg

Bursaphelenchus xylophilus – Pine wood Nematode

Pine wilt disease symptoms

- decrease of the resin flow – PWN at resin channels
- Yellowing and wilting of the needles– sap ascent blockage (embolism)

Bursaphelenchus xylophilus – Pine wood Nematode



Monitoring:

- dead or in poor health
- brown needles
- Blue stain
- symptoms of Longhorn beetles

Bursaphelenchus xylophilus – Pine wood Nematode

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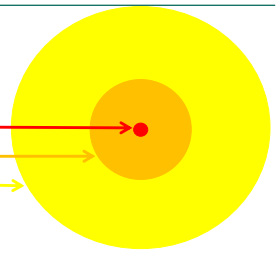
Bursaphelenchus xylophilus – Pine wood Nematode

demarcated area:

- infested tree
- infested area (500 m radius)
- buffer zone (20 km radius)

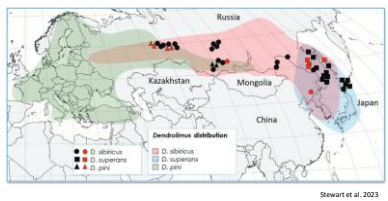


Dendrolimus sibiricus

- Union Quarantine Pest
- Priority Pest

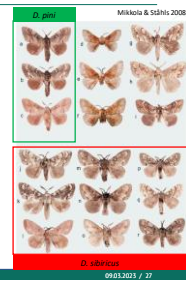
→ annual survey

Dendrolimus sibiricus



Stewart et al. 2023

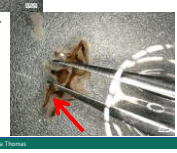
Mikkola & Ståhls 2008

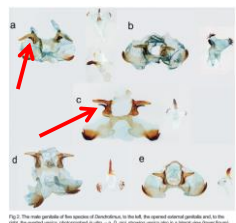


- wide polytypism and polymorphism

Dendrolimus sibiricus

Dendrolimus sibiricus





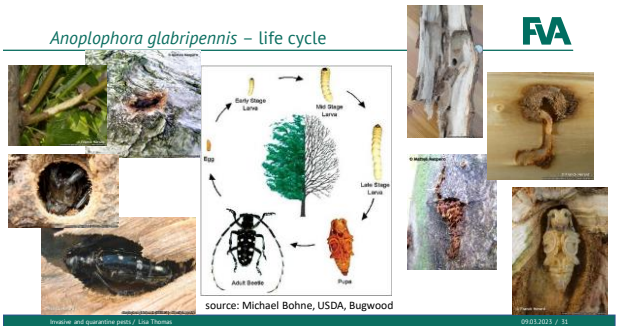
Mikkola & Ståhls 2008

Anoplophora glabripennis – Asian Longhorned Beetle

- invasive wood-boring beetle
- native to China and Korea
- Priority pest
- main hosts:
  - Maples (*Acer spp.*)
  - Willows (*Salix spp.*)
  - Horse chestnut (*Aesculus spp.*)
  - Poplars (*Populus spp.*)
  - Birch (*Betula spp.*)
- round exit holes (1-1,5 cm in diameter)

©Zimmermann/LTZ

Anoplophora glabripennis – life cycle



source: Michael Bohne, USDA, Bugwood

Anoplophora glabripennis

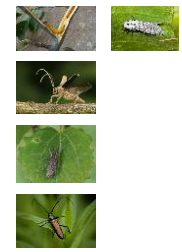
- BaWü: Grenzach-Wyhlen 2011, Hildrizhausen 2016 ✓
- Bavaria: Ziemetshausen 2014, last detection 2018 Miesbach 2019
- Saxony-Anhalt: Magdeburg seit 2014, last detection 2020
- NRW: Bornheim 2005, last detection 2017

Anoplophora glabripennis

source: Jörg Schumacher, FVA

native species

- *Zeuzera pyrina*
- *S. carcharias*
- *Saperda populnea*
- *Aromia moschata*



source: Wikimedia Commens

What if...?

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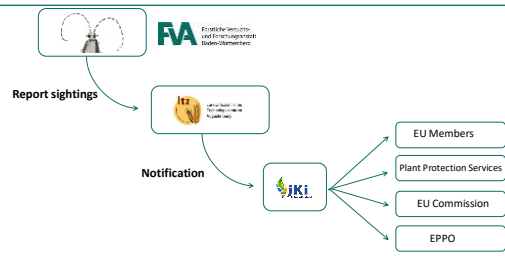


Oak lace bug (*Corythucha arcuata*)

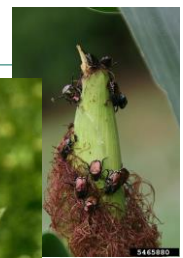
https://www.inaturalist.org/taxa/205712-Corythucha-arcuata

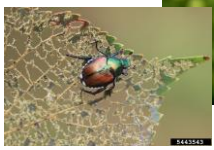
Oak lace bug (*Corythucha arcuata*)

Popillia japonica in Ticino

- first record in Italy: 2014
- first capture in Switzerland: 2017
- present during summer (mid-June to end of September) with a peak flight in July
- First damages were observed after 4 years, in vineyards and ornamental plants (ex: Rose)
- Diffusion of 4 km/year, but much more with passive transport
- Wetlands or irrigated gardens are an hot spot for reproduction
- Populations increased rapidly, approximatively 30 times with respect to the first year of presence

Popillia japonica - Damage





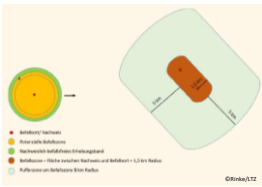
Popillia japonica - Damage

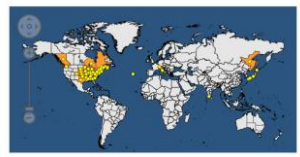
Popillia japonica – Japanese Beetle

Popillia japonica

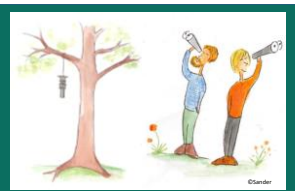
Popillia japonica – Japanese beetle

demarcated area





Thousand cankers disease



We are looking for a student assistant:
Please contact me if you are interested!

Lisa.Thomas@forst.bwl.de