



BIOLOGICAL INVASIONS IN FOREST – REGIONAL ASPECTS



Food and Agriculture Organization
of the United Nations

Ferenc Lakatos, director, Institut of Silviculture and
Forest Protection, University of West-Hungary

Outline

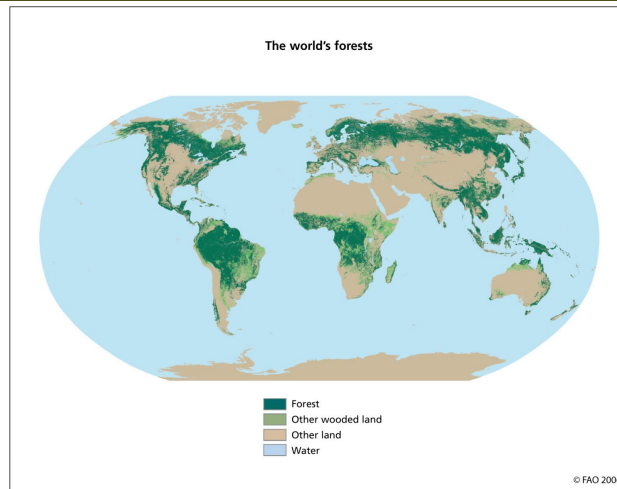
- ❖ Major forest health problems – European overview
- ❖ Effect of non native (invasive) species
 - Basic background information
 - Typical examples (C & E-EUR)
- ❖ Steps dealing with invasive species
- ❖ Possible tools & methods
- ❖ Resources
- ❖ Summary



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

World's forests



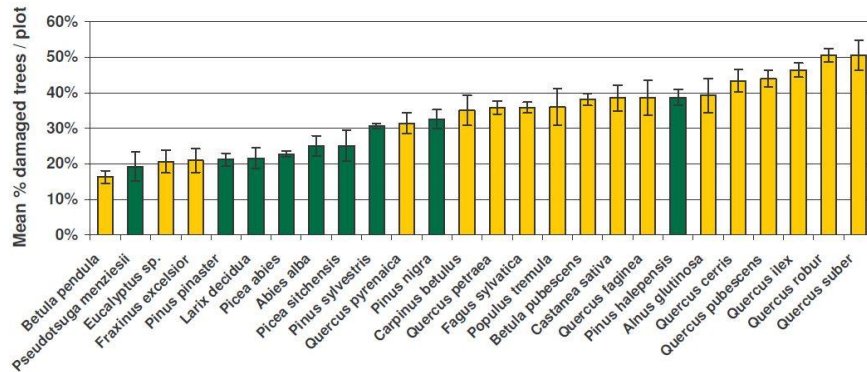
Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

The world's forests



Damages in European Forests – tree species



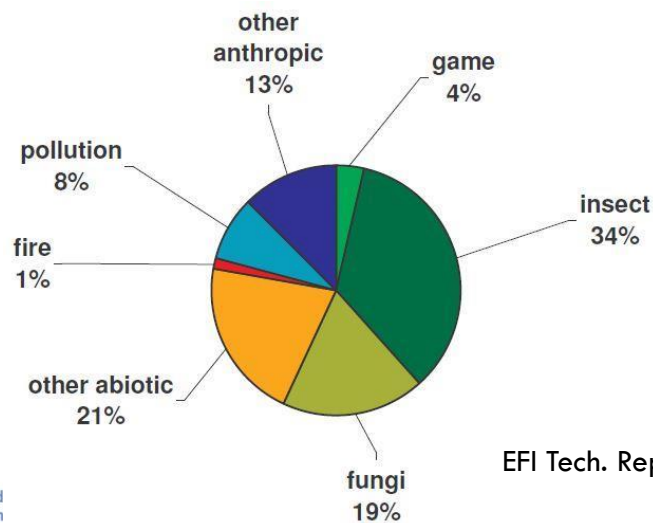
EFI Tech. Rep. 66, 2011



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Damage types in European Forests



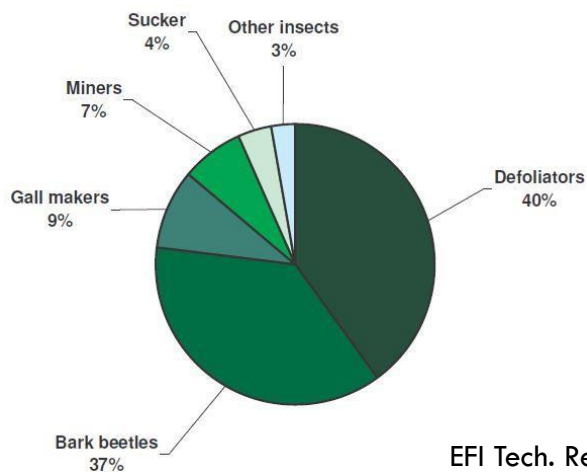
EFI Tech. Rep. 66, 2011



Food and
of the Un

Minsk, Belarus

Damages caused by insects

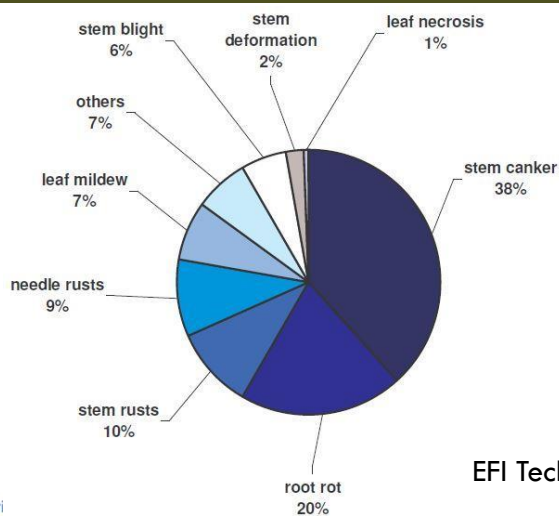


Food and Agriculture Organization
of the United Nations

EFI Tech. Rep. 66, 2011

6-7 September 2016, Minsk, Belarus

Damages caused by fungi

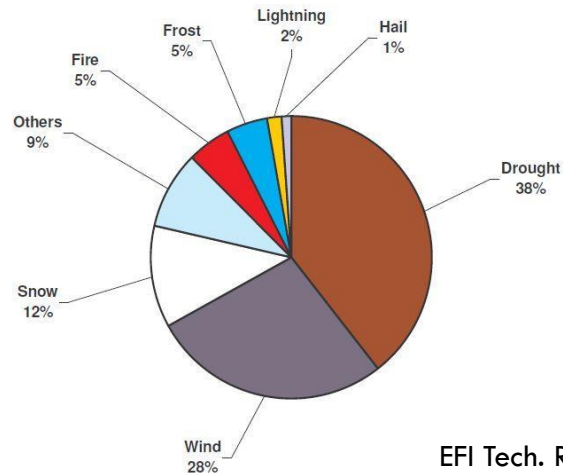


Food and Agri
of the United Nations

EFI Tech. Rep. 66, 2011

6-7 September 2016, Minsk, Belarus

Damages caused abiotic factors



Food and Agriculture Organization
of the United Nations

EFI Tech. Rep. 66, 2011

6-7 September 2016, Minsk, Belarus

Effects of non-native (invasive) species



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Motto

"On a global basis ... the two great destroyers of biodiversity are, first habitat destruction and, second, invasion by exotic species"

- E.O. Wilson



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Terminology

- ❖ **ALIEN SPECIES:** is a species, subspecies, or lower taxon occurring outside of its natural range (past or present) with a dispersal potential (*i.e.* outside the range it occupies naturally or could not occupy without direct or indirect *introduction* or care by humans) and includes any part, gametes or propagule of such species that might survive and subsequently reproduce.



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Terminology

- ❖ **AN INVASIVE SPECIES** is: a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Terminology

- ❖ Convention on Biological Diversity: **Invasive alien species** (IAS) are species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity.



Food and Agriculture Organization
of the United Nations

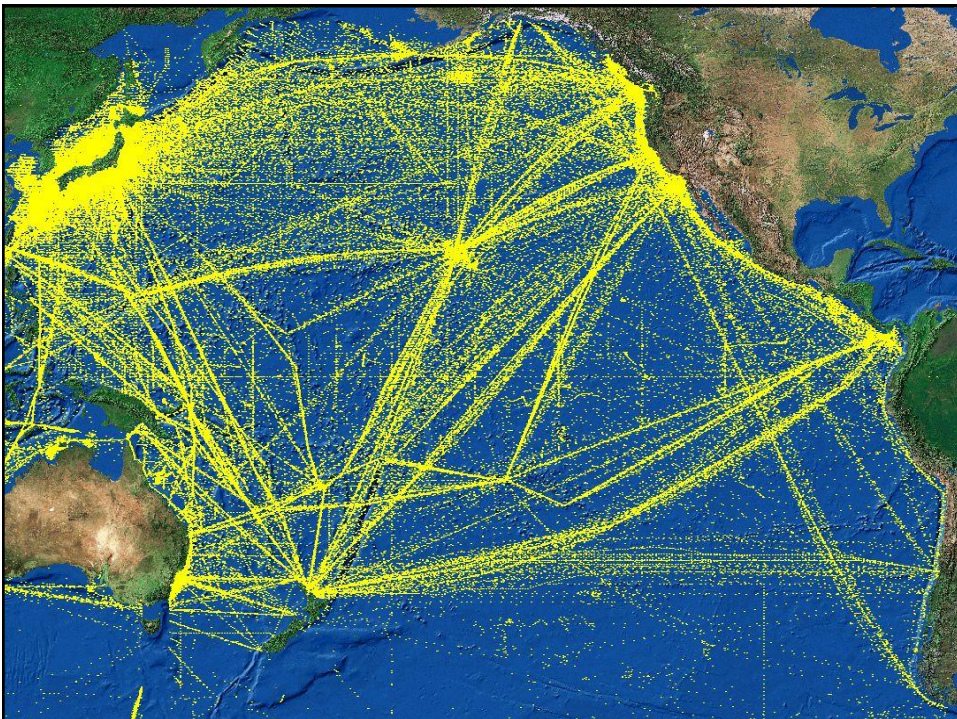
6-7 September 2016, Minsk, Belarus

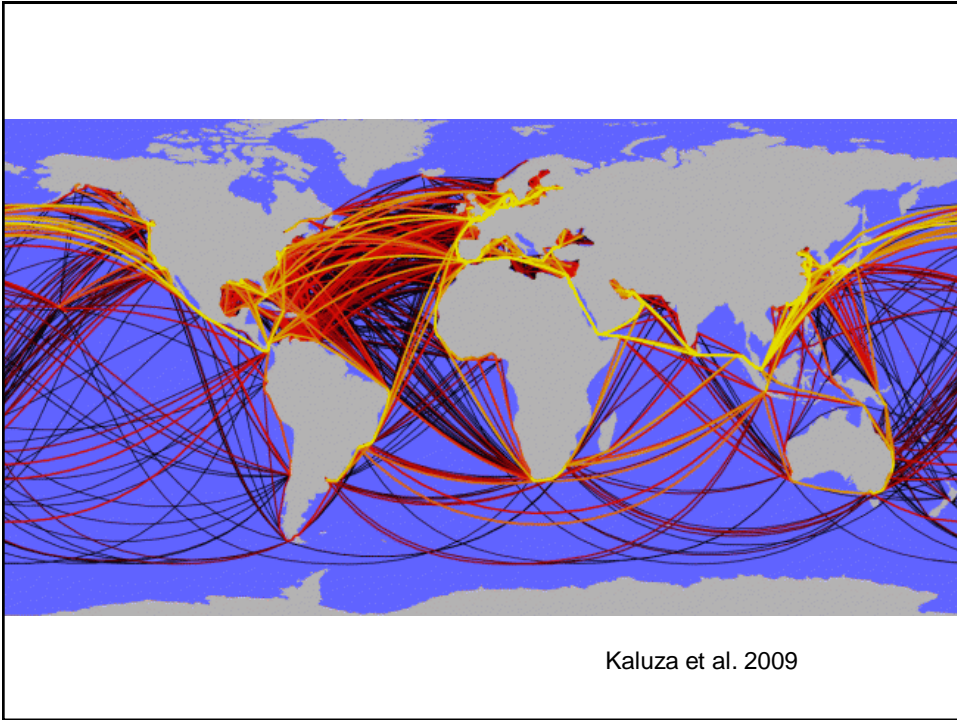
The origin of – invasive – species



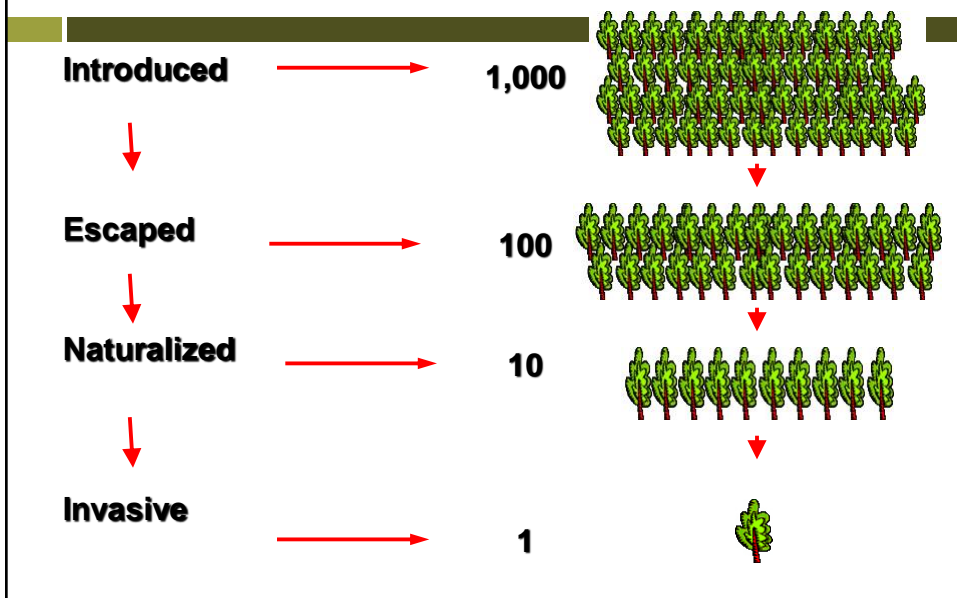
Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus





Tens Rule



Examples

- ❖ Plants (more details by Ingolf KÜHN)
- ❖ Fungi (more details by Lucio MONTECCHIO)
- ❖ Invertebrates (more details by Alain ROQUES)
- ❖ Vertebrates (more details by Wojciech SOLARZ)



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Robinia pseudoacacia

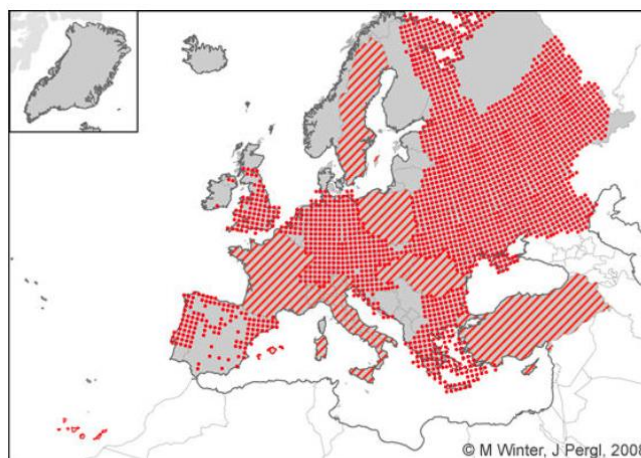
- ❖ Native range:
 - N-America (Appalachian)
- ❖ Known introduced range:
 - Europe, Asia, Africa, Australia
- ❖ Introduced to Europe:
 - 1601
- ❖ Effect:
 - Once introduced, expands rapidly
- ❖ Control:
 - Very difficult (with herbicides: dicamba, fosamine, glyphosate, imazapyr, picloram, triclopyr)



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Robinia pseudoacacia



For
of

Legend



Known in country



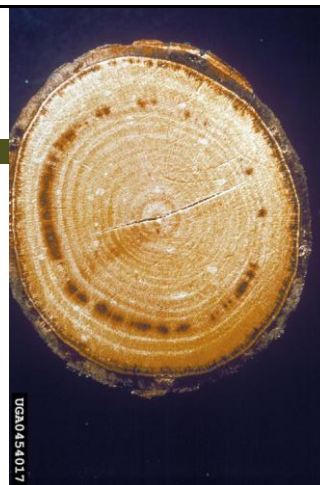
Known in CGRS square



Known in sea

Belarus

Ophiostoma ulmi & *novo-ulmi*



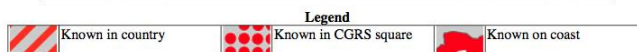
- ❖ Native range:
 - Asia (?)
- ❖ Known introduced range:
 - Europe, N-America
- ❖ Introduced to Europe:
 - ≈1800 and 1940
- ❖ Effect:
 - Complete elimination of elm (*Ulmus*) trees
- ❖ Control:
 - Very difficult, vector (*Scolytus* spp.) can be controlled in some ways, but never completely successful



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

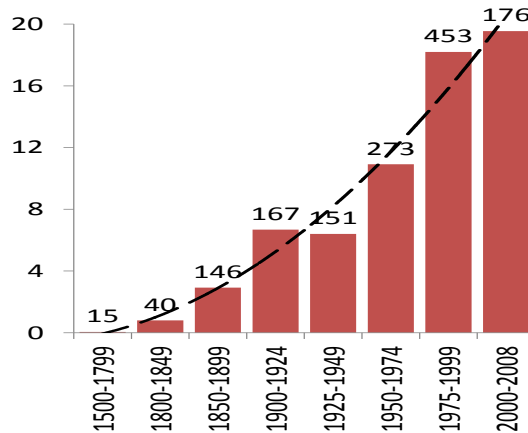
Ophiostoma ulmi & *novo-ulmi*



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Invasive insects in Europe (Roques et al. 2008)



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

If you want to become famous...

- Potato beetle (*Leptinotarsa decemlineata*)
- Europe:
 - 1876 (1901), UK
- Hungary:
 - Hédervár, 1947



If you want to become famous...

- Corn beetle (*Diabrotica virgifera*)
- Europe:
 - Belgrade (SR), 1992
- Hungary:
 - Mórahalom, 1995



Cydalima perspectalis



Food
of the

, Belarus

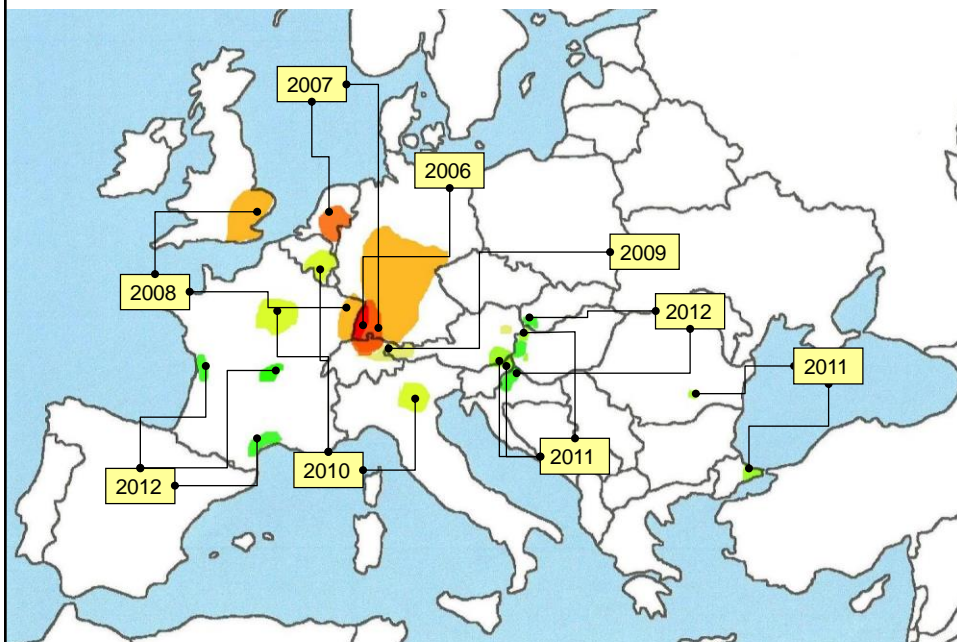
Natural distribution of *Cydalima perspectalis*



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Known distribution of *Cydalima* in Europe (2012)



Cydalima perspectalis

- ❖ Native range:
 - Asia
- ❖ Known introduced range:
 - Europe, expanding eastward (Turkey, Georgia,...)
- ❖ Introduced to Europe:
 - 2006
- ❖ Effect:
 - Heavy defoliation on *Buxus* spp. (e.g. *B. sempervirens*), sometimes mortality of the host
- ❖ Control:
 - Rather difficult, chemical control in early spring reduces population density, but always remaining & immigrant individuals



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Ondatra cibethicus



- ❖ Native range:
 - N-America
- ❖ Known introduced range:
 - Europe, Asia (China, Japan), S-America
- ❖ Introduced to Europe:
 - 1805 (CZ)
- ❖ Effect:
 - Vegetation impact through heavy grazing. Threats endemic species, damages irrigation systems, dams.
- ❖ Control:
 - Mechanical and chemical control applied, but heavy non target effect also observed.



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Steps for dealing with Invasive Species

- ❖ Prior introduction
 - Assessment and Risk Analysis
- ❖ To reduce introduction
 - Prevention
- ❖ After introduction
 - Early Detection
 - Rapid Response and Eradication
 - Control and Management
 - Restoration
- ❖ Research
- ❖ Public Education and Awareness



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

ERDŐMÉRŐI KAR
ERDŐMŰVELÉSI ÉS ERDŐVÉDELMI INTÉZET


HOME ERDŐMŰVELÉS TANSZÉK ERDŐVÉDELMI TANSZÉK KAPCSOLAT HALLGATÓKNAK ERDŐMÉRŐI MSC

Károsító Bejelentés


- Nyugati dióburok-fűrlégy
- Selyemfénnyű puszpángmoly
- Májusi és erdei cserebogár
- Észlelés bejelentése

Bejelentés


Károsító Bejelentés



Nyugati dióburok-fűrlégy




Selyemfénnyű puszpángmoly



Májusi és erdei cserebogár

Copyright | Kapcsolat Legutóbbi frissítés: 2013. április 17.

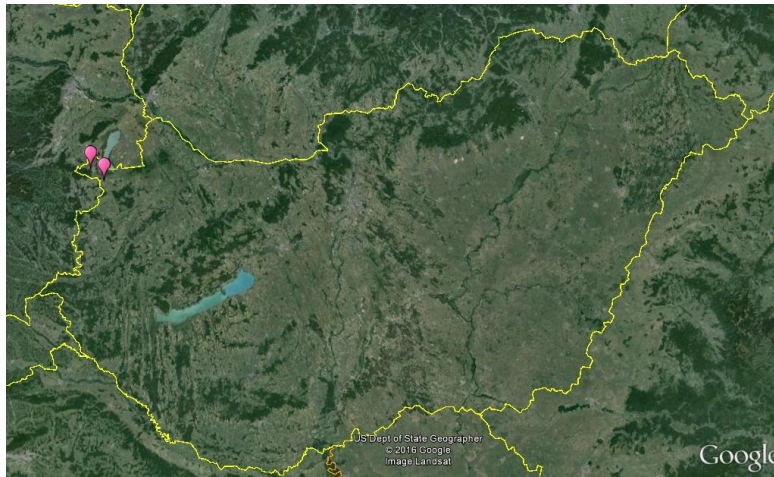
<http://emevi.emk.nyme.hu/index.php/22542/>



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

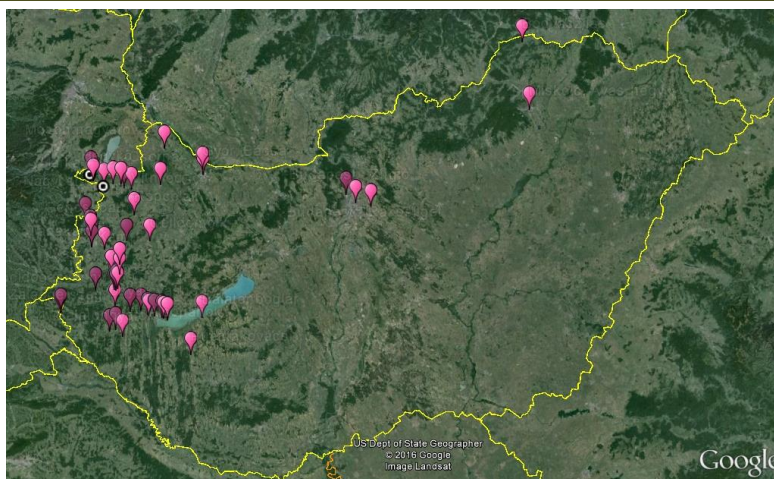
2012.



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

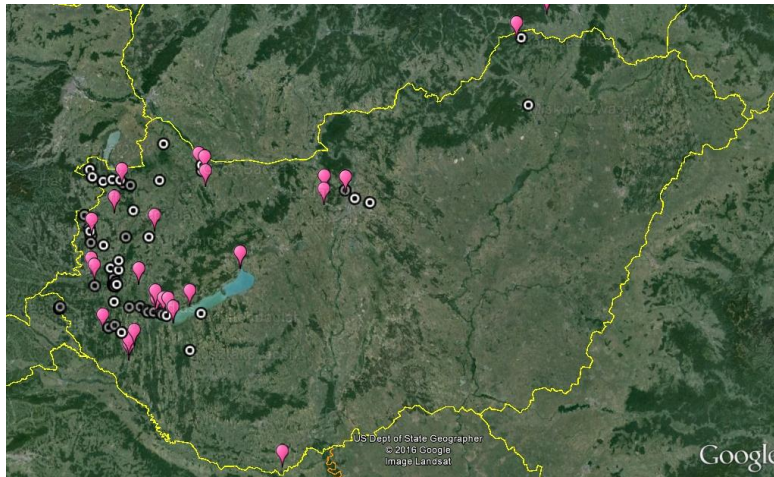
2013.



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

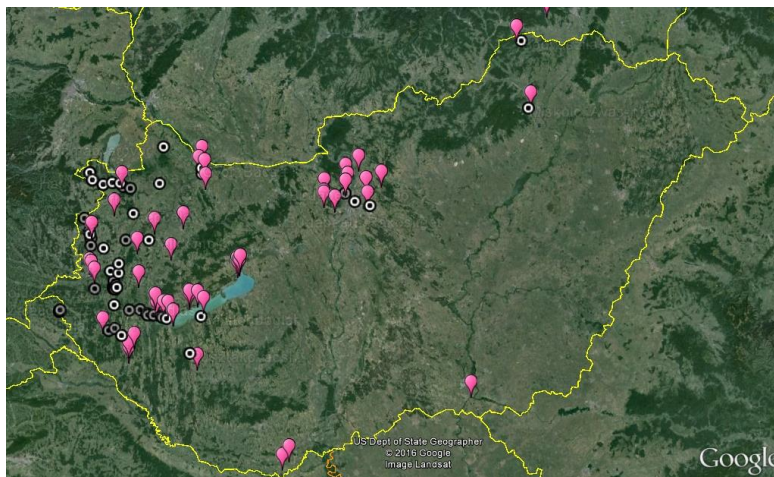
2014. 1st generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

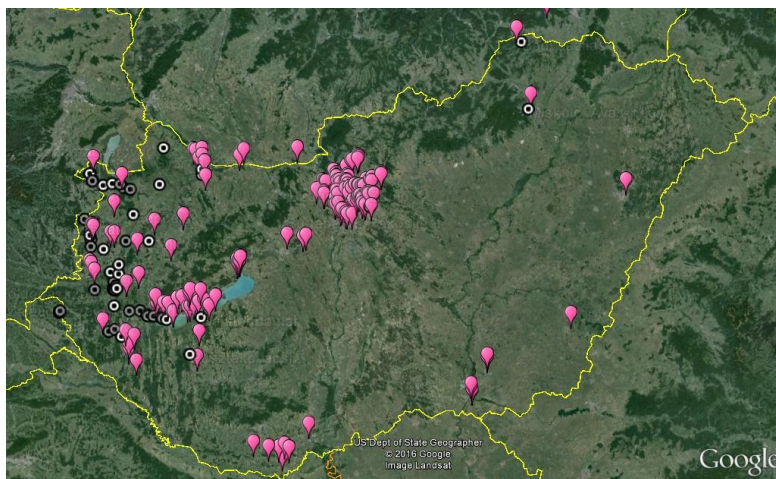
2014. 2nd generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

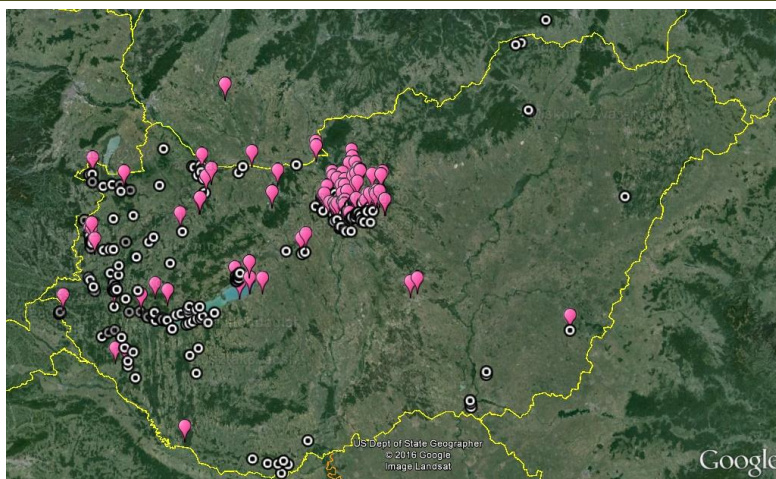
2014. 3rd generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

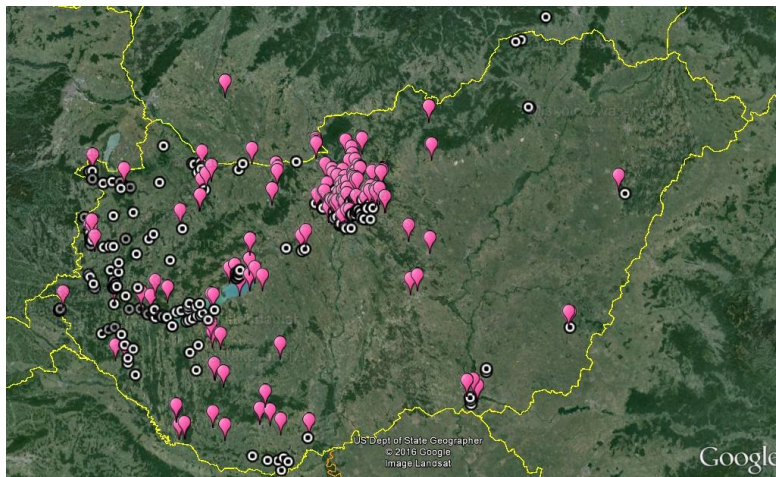
2015. 1st generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

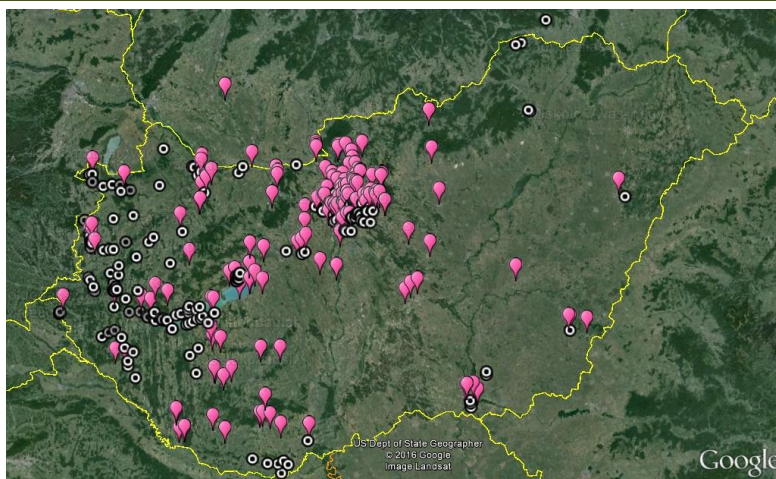
2015. 2nd generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

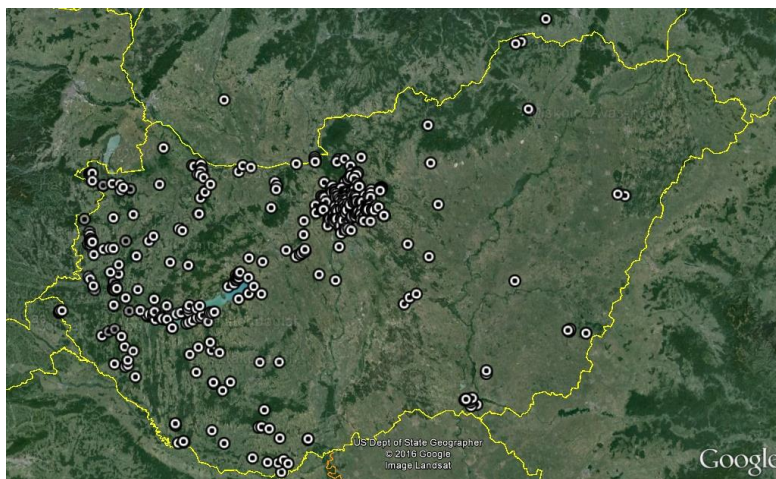
2015. 3rd generation



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

2012-2015



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Possible tools, methods

- ❖ Information
 - Collection
 - Distribution (international !!!)
 - Networks
 - Web based tools (webpages, social media, ...)
 - Printed materials (leaflet, flyer, poster, ...)
- ❖ Making awareness
- ❖ Involvement
 - Specialists (detection, determination, eradication)
 - Pubic (detection)



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

Resources: Organisations & Institutions

- ❖ **FAO**
 - FAO Forestry
- ❖ **EPPO**
 - European and Mediterranean Plant Protection Organization
- ❖ **Other online sources**
 - DAISIE – Database for European Invasive Species
 - Global Invasive Database
 - ...
- ❖ **The Bugwood network**
 - Forestryimages.org
 - Invasives.org



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

FAO Forestry ...

The screenshot displays the FAO Forestry website interface. At the top, there's a navigation bar with language options (Arabic, Chinese, English, French, Russian, Spanish). The main content area features several sections:

- News:** A headline reads "FAO and partners support natural resource management through sustainable wood fuel use strategies" dated 30 August 2016. Below it, a brief description mentions a project in Ethiopia's Gambella Region.
- Publications:** A section titled "More news" lists items like "FAO FLEG Programme call for concept notes from countries engaged in VPMs" and "Publication: Pulp and Paper Capacities, Survey 2015-2020".
- Resources:** A central area with four tiles: "Video: State of the World's Forests 2016", "Global Forest Resources Assessment Website", "Global forest products Facts and figures", and "Forestry Communication Toolkit".
- Upcoming Global Events:** A list of events including the "Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)", "Habitat III: UN Conference on Housing and Sustainable Urban Development", "UN Climate Change Conference (COP22)", and "13th Meeting of the Parties to the UN Convention on Biological Diversity".
- Core activities:** A sidebar on the right lists activities such as "Forest management", "Forest products and services", "Forest and environment", "People and forests", "Policy and governance", "Assessment and monitoring", and "Interdisciplinary issues".
- Footer:** Includes the FAO logo, "Food and Agriculture Organization of the United Nations", and a "Tweets by @FAOForestry" section.

FAO Forestry ...



FAO CORPORATE DOCUMENT REPOSITORY

Title: Guide to implementation of phytosanitary standards in forestry...
السيرة بالفرنسية Español Français Korean Russian 中文

Produced by: Forestry Department

PDF version
More details



FAO Forestry Paper 164

Guide to implementation of phytosanitary standards in forestry

Food and Agriculture Organization of the United Nations
Rome 2011

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

978-92-5-106785-7

All rights reserved. FAO encourages reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge, upon request. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials, and all queries concerning rights and licences, should be addressed by e-mail to copyright@fao.org or to the Chief, Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

Text in this guide is not an official legal interpretation of the International Plant Protection Convention (IPPC) or its related documents, and is produced for public information and guidance only.

© FAO 2011

Contents

(Download complete version - 2 MB)



Food and
of the Uni

Minsk, Belarus

European and Mediterranean Plant Protection Organization (EPPO)

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



Google Custom Search

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

What's New

- Panel on Diagnostics in Virology and Phytochemistry (Paris, 29/07 April)
- Panel on Phytosanitary Measures (Paris, 18/20 May)
- Panel on CMA Affairs (Paris, 24/29 April)
- Workshop on efficacy requirements and evaluation of PPPs based on low-risk active substances (Ede, 06/07 April) Read conclusions
- EWG on extrapolation tables for minor uses (Paris, 20/22 April)
- Panel on General Standards on Efficacy Evaluation (Paris, 09/11 March)
- Ad hoc Panel on Harmonization of data on PPPs and EPPO Codes (Paris, 27/08 March)
- Panel on Efficacy Evaluation of Herbicides and Plant Growth Regulators (Vienna, 09/11 February)
- Panel on Phytosanitary Measures for Potato (Paris, 14/18 February)
- Panel on Diagnostics in Mycology (Paris, 09/11 February)
- Ad hoc Panel on Plant Protection Information (Paris, 12/13 November)
- EPPO codes users meeting (Paris, 7 March)
- Panel on Diagnostics and Quality Assurance (Paris, 19/21 January)
- Read the EPPO Study on wood commodities other than round wood, sawn wood and manufactured items
- Panel on CMA Affairs (Paris, 13/14 January)
- Panel on Diagnostics in Bacteriology (Copenhagen, 20/22 October)
- Testa - EPPO Conference on diagnostics (Angers, 30 November/01 December)
- Resistance Panel on Plant Protection Products (Lierden, 16/17 September)
- Panel on Efficacy Evaluation of Fungicides and Insecticides (Zagreb, 17/19 November)
- EPPO/COST-SMARTER Workshop on Biological Control Agents (Budapest, 23/24 November)
- Panel on Phytosanitary Measures (Bologna, 06/08 October)
- Panel on Phytosanitary Measures for Potato (Kiev/Chashkovo, 19/21 May)
- 3rd Workshop for Heads of Laboratories (Rome, 06/11 September)
- Quilacat 2nd Workshop (Rome, 08/09 September)

EPPO Events

Welcome Georgia!
51st EPPO member country
Harmonized dose expression for the zonal evaluation of plant protection products in high growing crops (Vienna, 2016-10-18/20)
Joint EFSA-EPPO Workshop: Modelling in Plant Health (Parma, IT, 2016-12-12/14)
EPPO poster: "Don't Risk It"

EPPO is an intergovernmental organization responsible for European cooperation in plant health. Founded in 1951 by 15 European countries, EPPO now has 51 members, covering almost all countries of the European and Mediterranean region. Its objectives are to protect plants, to develop international strategies against the introduction and spread of dangerous pests and to promote safe and effective control methods. As a Regional Plant Protection Organization, EPPO also participates in global discussions on plant health organized by FAO and the IPPC Secretariat. Finally, EPPO has produced a large number of standards and publications on plant pests, phytosanitary regulations, and plant protection products.
[more information -](#)



Food and A
of the Uni

Minsk, Belarus

European and Mediterranean Plant Protection Organization (EPPO)

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



Google Custom Search

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

EPPO activities on Invasive Alien Plants

EPPO protects plants in agriculture, forestry and the uncultivated environment. For over 60 years, EPPO has sought to prevent the introduction and spread of organisms which are harmful to plants in the European and Mediterranean region. Traditionally, EPPO has given priority to pests of cultivated plants (i.e. insects, nematodes, fungi, bacteria, viruses), but more recently as new emphasis was given to the protection of biodiversity, it was acknowledged that plant protection also applied to plants in the uncultivated environment. Wild plants can be threatened by the introduction and spread of pests, and notably by 'invasive alien plants' which can seriously disturb and destroy natural plant communities.

Therefore in the early 2000s, EPPO started to work more specifically on invasive alien plants, in particular to analyze the risks presented by specific invasive alien plant species for the EPPO region and recommend measures to prevent their introduction and spread via international trade.


NEWS

- Visit the LIFE IAP-RISK website 'Mitigating the threat of invasive alien plants in the EU through pest risk analysis to support the EU Regulation 1143/2014'
- Follow our invasive plant tweets on @RobtannerRt
- *Cenchrus longispinus*: added to the EPPO Alert List
- *Landoltia punctata*: a new documented species

[Quick link to EPPO Lists of Invasive Alien Plants](#)

European and Mediterranean Plant Protection Organization (EPPO)

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



Google Custom Search

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

EPPO Global Database & EPPO codes

- <https://gd.eppo.int> -

The EPPO Global Database was first released in September 2014. The objective of the database is to gather in a single web-based interface, all pest-specific information that has been produced by EPPO.

This database also provides a new interface to view and download the EPPO codes, and is thus replacing EPPT (no longer maintained).

Although, some parts of EPPO Global Database are still under development, it currently contains:

- Basic information for more than 72 000 species of interest to agriculture, forestry and plant protection: plants (cultivated and wild) and pests (including pathogens). For each species: scientific names, common names in different languages, taxonomic position, and EPPO codes are given.
- Detailed information for more than 1600 pest species that are of regulatory interest (EPPO and EU listed pests, as well as pests regulated in other parts of the world). For each pest: geographical distribution (with a world map), host plants and categorization (quarantine status) are given. The majority of the functionalities of PQR (EPPO database on quarantine pests) has already been transferred to EPPO Global Database.
- EPPO datasheets (for the moment, only those published in 1997 in the book Quarantine Pests for Europe are included).
- EPPO Standards.
- More than 3000 pictures of pests (including invasive alien plants).
- All articles from the EPPO Reporting Service (since 1994).

What are the EPPO codes?

EPPO codes are computer codes developed for plants, pests (including pathogens) which are important in agriculture and plant protection.

Belarus

European and Mediterranean Plant Protection Organization (EPPO)

Home

About EPPO

Meetings

Plant quarantine

Plant Protection Products

Invasive alien plants

Standards

Databases

Publications

Worldwide activities

European and Mediterranean Plant Protection Organization

Organisation Européenne et Méditerranéenne pour la Protection des Plantes

EPPO A1 List of pests recommended for regulation as quarantine pests

(version 2015-09)

EPPO recommends its member countries to regulate the pests listed below as quarantine pests (A1 pests are absent from the EPPO region). The EPPO A1 List is reviewed every year by the Working Party on Phytosanitary Regulations and approved by Council.

Unless specified otherwise, all data sheets have been published in: EPPO/CABI (1997) Quarantine Pests for Europe. 2nd edition. Edited by Smith IM, McManis DG, Scott PR, Holderness M. Wallingford, UK, 1425 pp.

Click on the links to access pest-specific information stored in EPPO Global

EPPO DATA SHEETS ON QUARANTINE PESTS

Anoplophora glabripennis

IDENTITY

Name: *Anoplophora glabripennis* (Motschulsky)

Common names: Asian long-horn beetle (English)

Basicosta white-spotted longicorn beetle (English)

Starry sky beetle (English)

Taxonomic position: Insecta: Coleoptera: Cerambycidae

Notes on taxonomy and nomenclature: the taxonomy of this genus is in some confusion. *A. glabripennis* is part of the *glabripennis* complex, comprising *A. glabripennis*, *A. freyi*, *A. flavonaculata* and *A. coeruleoantennatus* (the latter being doubtful, taxonomically) (Wu & Jiang, 1998). Wu & Jiang (1998) considered the members of the *glabripennis* complex on a geographical basis within China, possibly pointing to different races of *A. glabripennis* in various parts of the country. For example, there is debate in China whether *A. glabripennis* from northern China and *A. glabripennis* from southern China are actually two separate species (Chen, 1989). There is also potential for *A. malasiaca* and *A. chinensis* (EPPO A1 list) to be confused with *A. glabripennis*.

Bayer computer code: ANOLGL

EPPO A1 list: no. 296

ET: subject to emergency measures under Commission Decision 1999/344

European and Mediterranean Plant Protection Organization (EPPO)

Home

About EPPO

Meetings

Plant quarantine

Plant Protection Products

Invasive alien plants

Standards

Databases

Publications

Worldwide activities

European and Mediterranean Plant Protection Organization

Organisation Européenne et Méditerranéenne pour la Protection des Plantes

EPPO and Pest Risk Analysis

One of EPPO's main priorities is to prevent the introduction of dangerous pests (bacteria, fungi, insects, plants, viruses...) from other parts of the world, and to limit their spread within the region should they be introduced. In recent years, trade networks have expanded and diversified, increasing the risks of introducing pests to new geographical areas. Measures adopted by countries to protect their territories from these introductions should be technically justified and an International Standard for Phytosanitary Measures (ISPM) on Pest Risk Analysis (ISPM no. 11) has been developed in the International Plant Protection Convention (IPPC) framework. Since the 1990s, the following developments have taken place within EPPO:

- EPPO has developed a decision-support scheme for Pest Risk Analysis and a computer program (CAPRA) to assist pest risk analysts in running the decision-support scheme - [read more](#) >>
- A Panel on PRA development has been created - [read more](#) >>
- Expert Working Groups (EWGs) are now being convened to conduct PRAs on specific pests - [read more](#) >>

EPPO Standards and CAPRA

- CAPRA (Computer Assisted Pest Risk Analysis) - [view more information and download software](#)
- PM 5/1(1) Check-list of information required for PRA - [English](#) | [French](#) | [Russian](#)
- PM 5/2(2) PRA on detection of a pest in an imported consignment - [English](#) and [French](#) | [Russian](#)
- PM 5/3(5) Decision-support scheme for quarantine pests - PRA Scheme version 2011 - [English](#) | [French](#) | [Russian](#)
- Word versions - [English](#) | [French](#) | [Russian](#)
- PM 5/5(1) Decision-Support Scheme for an Express Pest Risk Analysis - [English](#) | [French](#) | [Russian](#)
- Word versions - [English](#) | [French](#) | [Russian](#)
- PM 5/6(1) EPPO prioritization process for invasive alien plants - [English](#) | [Russian](#)
- PM 5/7(1) Screening process to identify priorities for commodity PRA for plants for planting

26

DAISIE – Database for European Invasive Species

[Home](#)
[100 of the Worst](#)
[About DAISIE](#)
[Search Species](#)
[Search Region](#)
[Search Experts](#)
[Register as an expert](#)
[European Summary](#)

Delivering Alien Invasive Species Inventories for Europe

Impatiens glandulifera
one of the 100 worst alien species in Europe, [click here to see the full list](#).

© Petr Pyšek

Delivering Alien Invasive Species Inventories for Europe

Biological invasions by non-native or 'alien' species are one of the greatest threats to the ecological and economic well-being of the planet. Alien species can act as vectors for new diseases, alter ecosystem processes, change biodiversity, disrupt cultural landscapes, reduce the value of land and water for human activities and cause other socio-economic consequences for man.

To help those tackling the invasive species challenge, this website provides a 'one-stop-shop' for information on biological invasions in Europe. Please note that the DAISIE database behind this website is continually being updated. [Read more about DAISIE](#).

DAISIE Handbook of alien species in Europe available

Search Species

Invasive Species of the Week

ISSG
Invasive Species Specialist Group

Search Regions

Search for information on one of the 12122 alien species occurring in Europe.

Search Experts

Search for one of the 2440 experts on biological invasions in Europe

This website was developed with support from the European Commission under the Sixth Framework Programme through the DAISIE project - Contract Number: SSP-CT-2003-511202. [Leave Feedback](#)

DAISIE – Database for European Invasive Species

[Home](#)
[100 of the Worst](#)
[About DAISIE](#)
[Search Species](#)
[Search Region](#)
[Search Experts](#)
[Register as an expert](#)
[European Summary](#)

Delivering Alien Invasive Species Inventories for Europe

100 of The Worst

Order by Name
[Show Aquatic Marine](#)
[Show Aquatic Inland](#)
[Show Terrestrial Fungi](#)
[Show Terrestrial Invertebrates](#)
Show Terrestrial Plants
[Show Terrestrial Vertebrates](#)

Acacia dealbata

Magnoliophyta » **Magnoliophyta** » **Rosopsida** » **Fabales** » **Fabaceae** » **Acacia dealbata**
This fast growing tree can reach up to 30m in height. Leaves are greyish-green and segmented, leaf axis has glands only at the insertion of the pinnae. Flower heads are 5-6mm in diameter, pale yellow. Legume is compressed, scarcely constricted between...

Ailanthus altissima

Magnoliophyta » **Magnoliophyta** » **Rosopsida** » **Sapindales** » **Simaroebaceae** » **Ailanthus altissima**
This fast growing deciduous tree, 6-10 m high, has large compound leaves, composed of 11-25 leaflets that alternate along the stems. Fruits are very distinctive for their long samaras forming large bunches, turning reddish in summer. All parts of th...

Ambrosia artemisiifolia

Magnoliophyta » **Magnoliophyta** » **Rosopsida** » **Asteriales** » **Asteraceae** » **Ambrosia artemisiifolia**
Summer monoecious annual plant 0.2 - 2.5 m tall. The male flowers (2-4mm) are grouped in racemes at the end of branches, while female flowers are located at the bases of upper leaves. It produces a woody reddish-brown indehiscent fruit (akenes) with ...

Campylopus introflexus

Bryophyta » **Bryophyta** » **Bryopsida** » **Dumetiales** » **Dumetaceae** » **Campylopus introflexus**
A moss with leaves tapering to a long, whitish hair-point. When plants dry the leaves become crisp, twisting slightly round the stem (5 cm long), with the hair-points bent at right angles, horizontally outwards. The capsules are produced in spring, o...

DAISIE – Database for European Invasive Species

[Home](#) |
 [100 of the Worst](#) |
 [About DAISIE](#) |
 [Search Species](#) |
 [Search Region](#) |
 [Search Experts](#) |
 [Register as an expert](#) |
 [European Summary](#)



Species Factsheet

! *Ophiostoma novo-ulmi*



Details

Complete name: *Ophiostoma novo-ulmi* (Brasier 1991)
 Taxonomy: Fungi » Ascomycota » Sordariomycetes » Ophiostomatales » Ophiostomataceae » *Ophiostoma novo-ulmi*
 Authors: Marie-Laure Desprez-Loustau
 Last updated: November 5th, 2006

Common Names

Dutch elm disease.

Synonyms

Ceratocystis ulmi
Ophiostoma novo-ulmi
Pesotum ulmi (Anamorph)

Short Description

Two destructive pandemics of Dutch Elm Disease occurred in the 20th century, caused by two closely related micro-fungi. *Ophiostoma novo-ulmi*, initially termed the aggressive subgroup of *O. ulmi sensu lato*, was responsible for the more recent second pandemic and has progressively replaced *O. ulmi sensu stricto*, less aggressive and competitive, which caused the first one. *O. novo-ulmi* includes two sub-species, *O. novo-ulmi* subsp. *americana* and *O. novo-ulmi* subsp. *novo-ulmi*. Dutch Elm Disease is a wilt disease, first discovered and studied in the Netherlands by seven pioneering female scientists.

Description
[Ecology & Habitat](#)
[Distribution](#)
[Impact and Management](#)
[Contributors and Experts](#)
[References and Links](#)
[Download Factsheet](#)



This website was developed with support from the European Commission under the Sixth Framework Programme through the DAISIE project - Contract Number: SSPI-GT-2003-511202. [Leave Feedback](#)

Global Invasive Species Database



GLOBAL INVASIVE SPECIES DATABASE

[HOME](#) |
 [ABOUT THE GISD](#) |
 [HOW TO USE](#) |
 [CONTACTS](#)





Results of your query will be returned by **species**



ADVANCED SEARCH OPTIONS



Alnus glutinosa




Trachycarpus fortunei



Prunus campanulata




Bugwood network



THE UNIVERSITY OF GEORGIA
**CENTER FOR INVASIVE SPECIES
 ECOSYSTEM HEALTH**
FORESTRY AND NATURAL RESOURCES ENVIRONMENTAL SCIENCE

Utilizing partnerships & information technology to advance
invasive species, forestry & agriculture education

[Home](#)
[About Us](#)
[Topics](#)
[Websites](#)
[Publications](#)
[Images](#)
[Contact Us](#)
[Support Us](#)



[Forestry Images](#)
[Invasive.org](#)
[EDDMapS](#)
[Bugwood Wiki](#)
[Insect Images](#)
[IPM Images](#)
[Bugwood Apps](#)

make a
donation

What's New

Pollinators Threatened by Invasive Plants

Whole Foods is selling invasive lionfish in Florida

The usefulness, value and utility of Bugwoodimages is demonstrated in the April 2016 issue of "IPM Insights", the

Stay Connected

Join Us on Facebook


Subscribe to our RSS Feed

Quick Links

Topics

- Agriculture
- Bark Beetles
- Christmas Trees
- Cogongrass
- Forest A Syst
- Forest Pests
- Forest Productivity

Invasives



Center for Invasive Species and Ecosystem Health

[Invasives 101](#)
[Species](#)
[Images](#)
[Publications](#)
[Maps](#)
[Videos](#)
[Control](#)
[EDRR](#)
[CWMA/CISMAs](#)
[How to ...](#)
[Global](#)
[Help](#)


Check out our Newest Features

Browse ▾ Search 🔍


Invasive and Exotic Species of North America

any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem; and whose introduction does or is likely to cause economic or environmental harm or harm to human health.


Plants




Insects

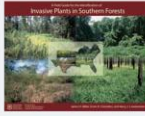


Pathogens



Other Species






A Field Guide for the Identification of Invasive Plants in Southern Forests


Update of Jim Miller's book now providing information on accurate identification of 56 plants that are aggressively invading forests of the 13 Southern States at alarming rates.

[More info...](#)



Cooperative Agricultural Pest Survey

With the enormous range of foreign and domestic pests that could wreak havoc on native plant species and agricultural industries, protecting U.S. agriculture and plant resources... [More info...](#)



Cogongrass Road Crew Training Resources

Cogongrass (*Imperata cylindrica*) is one of the worst invasive plants we have in the South. This link contains information and resources for Extension agents to conduct a short informational training program for their county road crews. [More info...](#)

Statistics

2,891 Invasive Species
 1,951 species with images
 60,371 images

News & Site Updates

Pollinators Threatened by Invasive Plants

Whole Foods is selling invasive lionfish in Florida.

The usefulness, value and utility of Bugwoodimages is demonstrated in the April 2016 issue of "IPM Insights", the Newsletter of the Northeastern (USA) IPM Center

Rampaging Radioactive Wild Boars Causing Havoc

Map Gallery Pear Challenge!

Trees in Trouble: A documentary film about America's Urban Forests. Coming to PBS

Native Predators May Be Having a Larger Impact than Expected on Invasive Strik Bug

USDA-APHIS Associate Administrator Shares some Trade

"A picture is worth a thousand words" (Keith Douce)



David T. Almquist, University of Florida *Dendroctonus terebrans* (Olivier)

... FAO Forestry



Regional networks - APFISN



Regio

SN



Food and Agriculture
of the United Nations

er 2016, Minsk, Belarus

Summary

- ❖ Large number of invasive plants, microorganisms and animals:
 - Introduction of invasive species
 - By human assisted migration
 - 'Natural' range expansion (e.g. due to climate change)
 - Combination of the above two
- ❖ To have the right information on time is crucial
- ❖ The involvement of the broader public can contribute to be more effective
- ❖ Long term (sustainable) monitoring is needed
- ❖ Use new technologies!



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus

“It is not the strongest of the
species that survives,
or the most intelligent;
it is the one most capable of
change.”

(Anonymous)



Food and Agriculture Organization
of the United Nations

6-7 September 2016, Minsk, Belarus