Assessing the risk of invasive alien plants on plant health for the EPPO region

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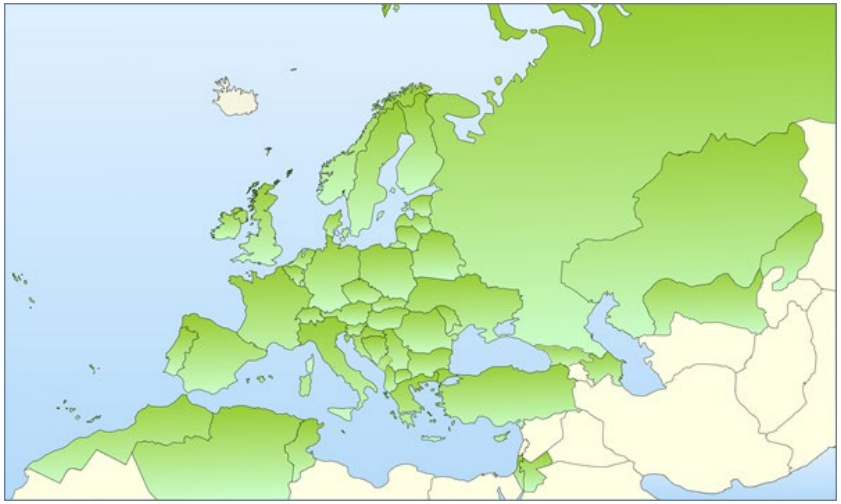
ISTA Seed Quality Assurance

ISTA Plant Health Seminar, May 2021

The European and Mediterranean Plant Protection Organization

- Regional Plant Protection Organization
- Created in 1951, now 52 member countries
- Supports National Plant Protection Organizations (NPPOs) of member countries
- Cooperation and harmonization
- Regional standards on Phytosanitary regulation and Plant Protection Products
- Technical meetings of experts
- International conferences
- Sharing information and expertise through networks
- Dissemination of information on plant health

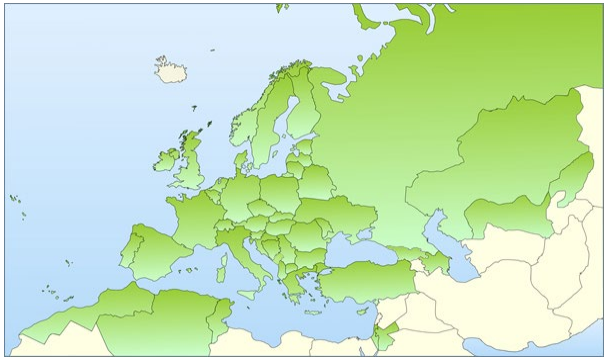


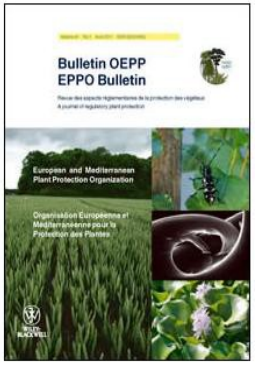
Remit of EPPO

- Plant quarantine
- Plant certification and Regulated Non-Quarantine Pests
- Invasive alien plants
- Biological control agents
- Efficacy of plant protection products

By…….

- Developing and adopting regional technical Standards,
- Pest Risk Analysis and prioritization of pests (plant pests and invasive alien plants),
- Dissemination of information,
- Facilitating networking through Panel meetings, conferences and workshops.





Solidago canadensis (SOOCA) - https://gd.eppo.int

Impatiens capensis (IPACA) - https://gd.eppo.int

Microstegium vimineum (MCGVI) - https://gd.eppo.int

Gunnera tinctoria (GUATI) - https://gd.eppo.int

Humulus scandens (HUMJA) - https://gd.eppo.int

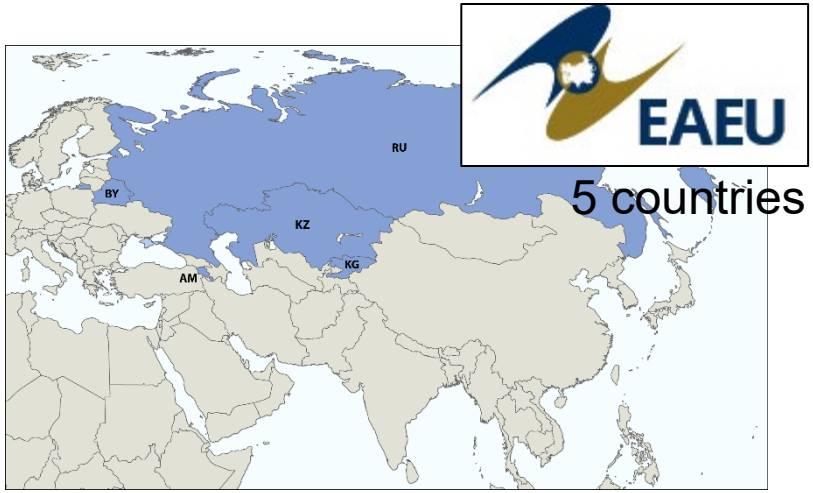
Heracleum mantegazzianum (HERMZ) - https://gd.eppo.int

Pathways

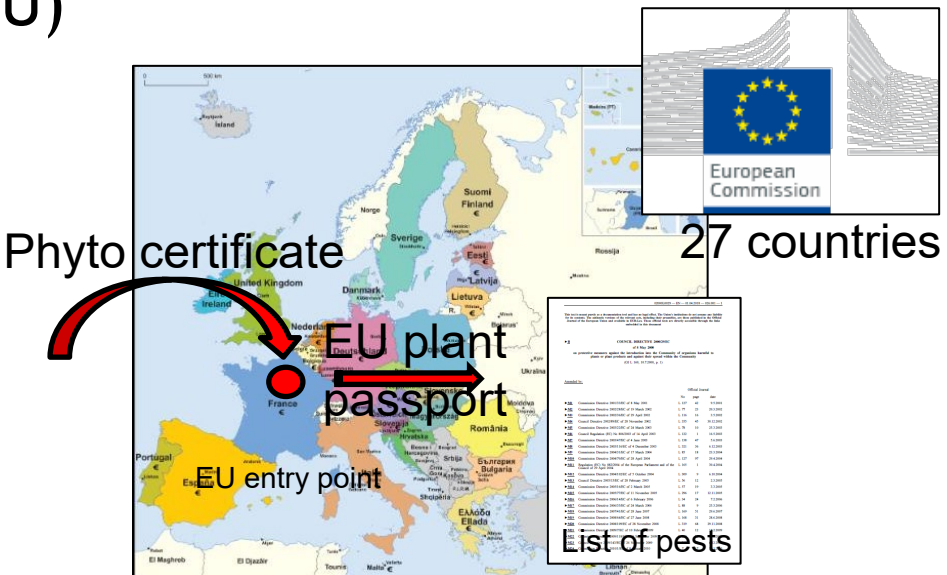
- Plants for planting (excluding seed) (horticulture, forestry, biofuels, agriculture, etc.)
- Seed (for planting)
- Grain for animal feed mixtures, human consumption and for processing purposes
- Seeds mixtures
- Used agricultural machinery and equipment
- Hay
- Manure
- Travellers and their equipment
- Soil and other growing media (on its own or associated with plants for planting other than seeds)
- Wool products
- Livestock
- Natural spread

Regulations in EPPO countries

- EPPO makes recommendations
- Plant health regulations defined generally at national level



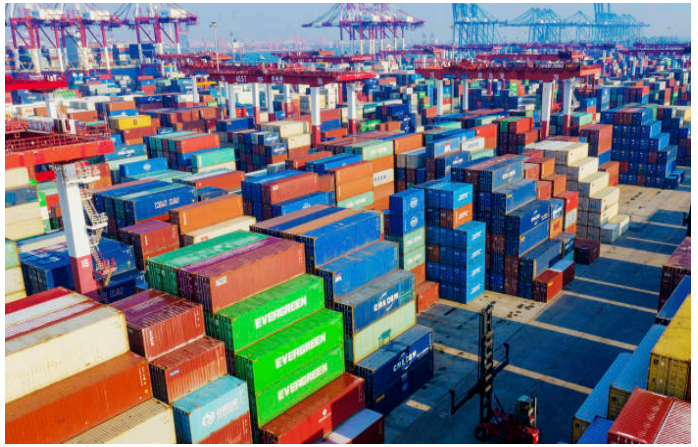
- 2 common markets (EU, EAEU) with common pest lists & harmonized regulations



International plant health context

- International trade in commodities has increased
- 1994 Sanitary and Phytosanitary agreement (SPS)

Sovereign right of Countries to establish Phytosanitary Measures to protect plant life or health but the measures should be technically justified.



International plant health context

Pest risk analysis

Process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it

* ISPM 5 (2016) Glossary of phytosanitary terms

Risk assessment

Stage 1. Initiation

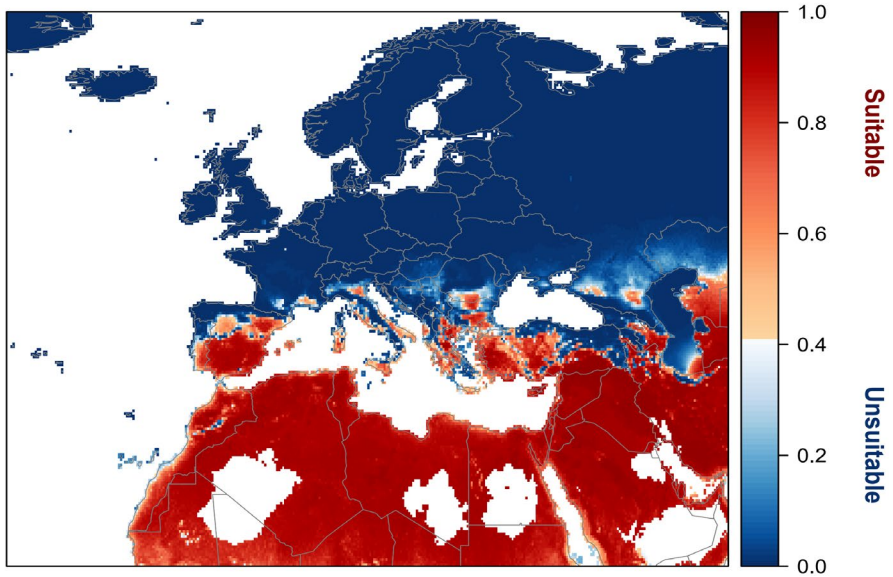
- Reason for performing the PRA
- PRA area

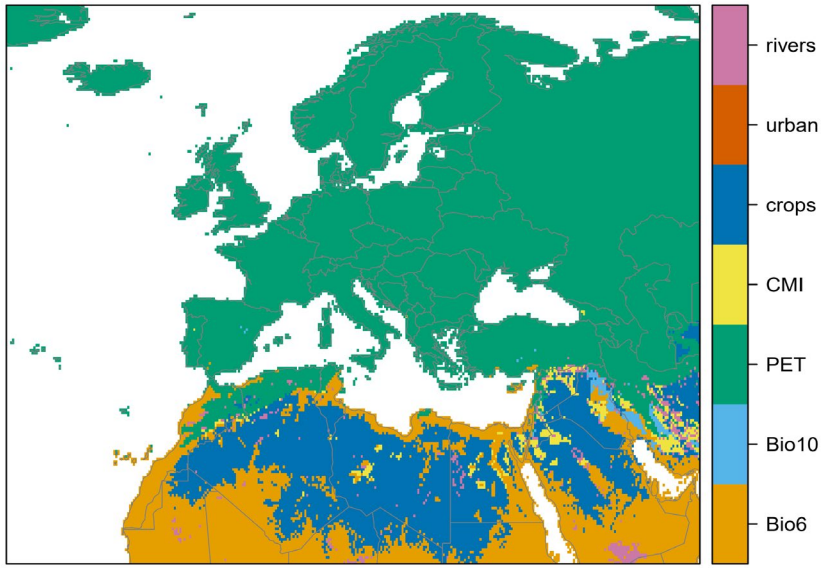
Stage 2. Pest risk assessment

- Taxonomy
- Pest overview
- Host plants
- Need for vector
- Geographical distribution
- Possible pathways for entry
- Likelihood of establishment outdoors/in protected conditions in the PRA area
- Spread in the PRA area
- Impact in the current area of distribution
- Potential impact in the PRA area
- Identification of the endangered area

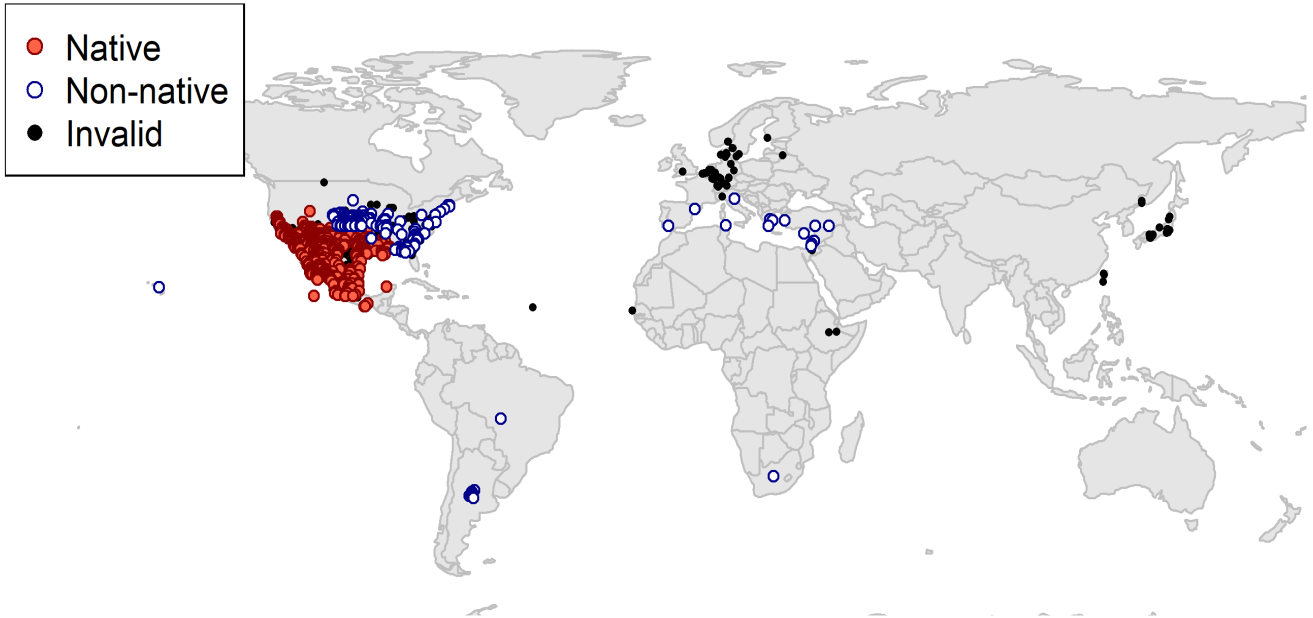
EVIDENCE BASED

- What we know
- What we don’t know
- What is likely to happen/occur





(a) Species distribution used in modelling



Stage 3.

Phytosanitary measures

- at origin or in the exporting country
- at the point of entry or
- within the importing country or invaded area

Combination of measures in a System Approach

EPPO Alert List

Species included in the Alert List have been selected by the EPPO Secretariat or proposed by EPPO member countries, because they may present a risk to the EPPO region. Most species are still of limited distribution, or absent from the EPPO region.

Lycium ferocissimum

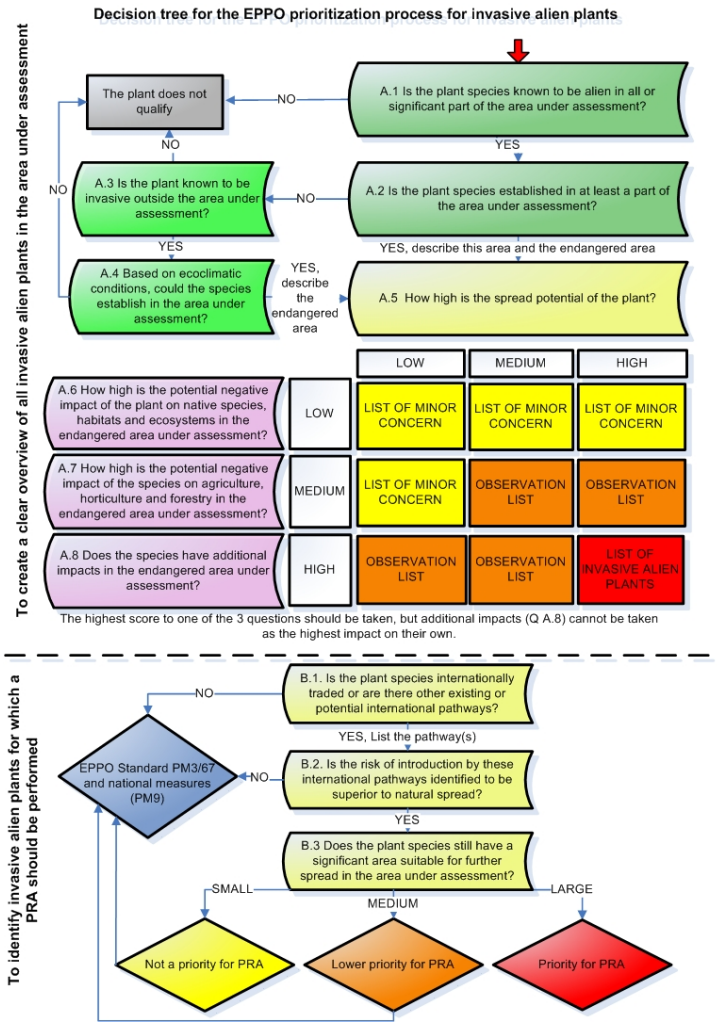
Solanum carolinense

Lonicera acuminata

EPPO Reporting Service

Plant name	Added in
Euphorbia davidii	2021
Lonicera acuminata	2019
Lycium ferocissimum	2020
Pseudosasa japonica	2020
Solanum carolinense	2020
Solanum sisymbriifolium	2020
Trianthema portulacastrum	2020

The EPPO prioritization process for IAP
General principles

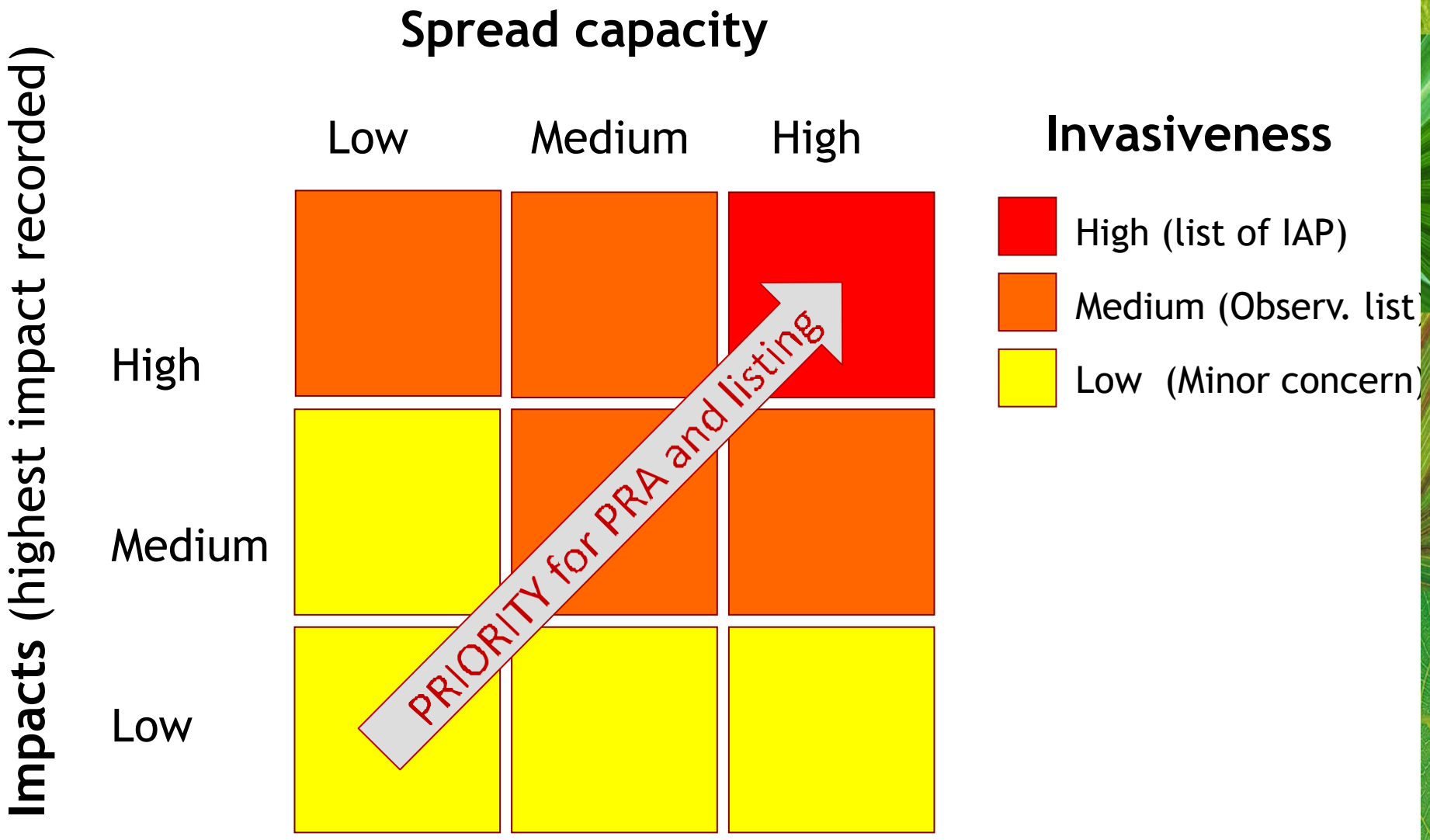


The EPPO process is designed:

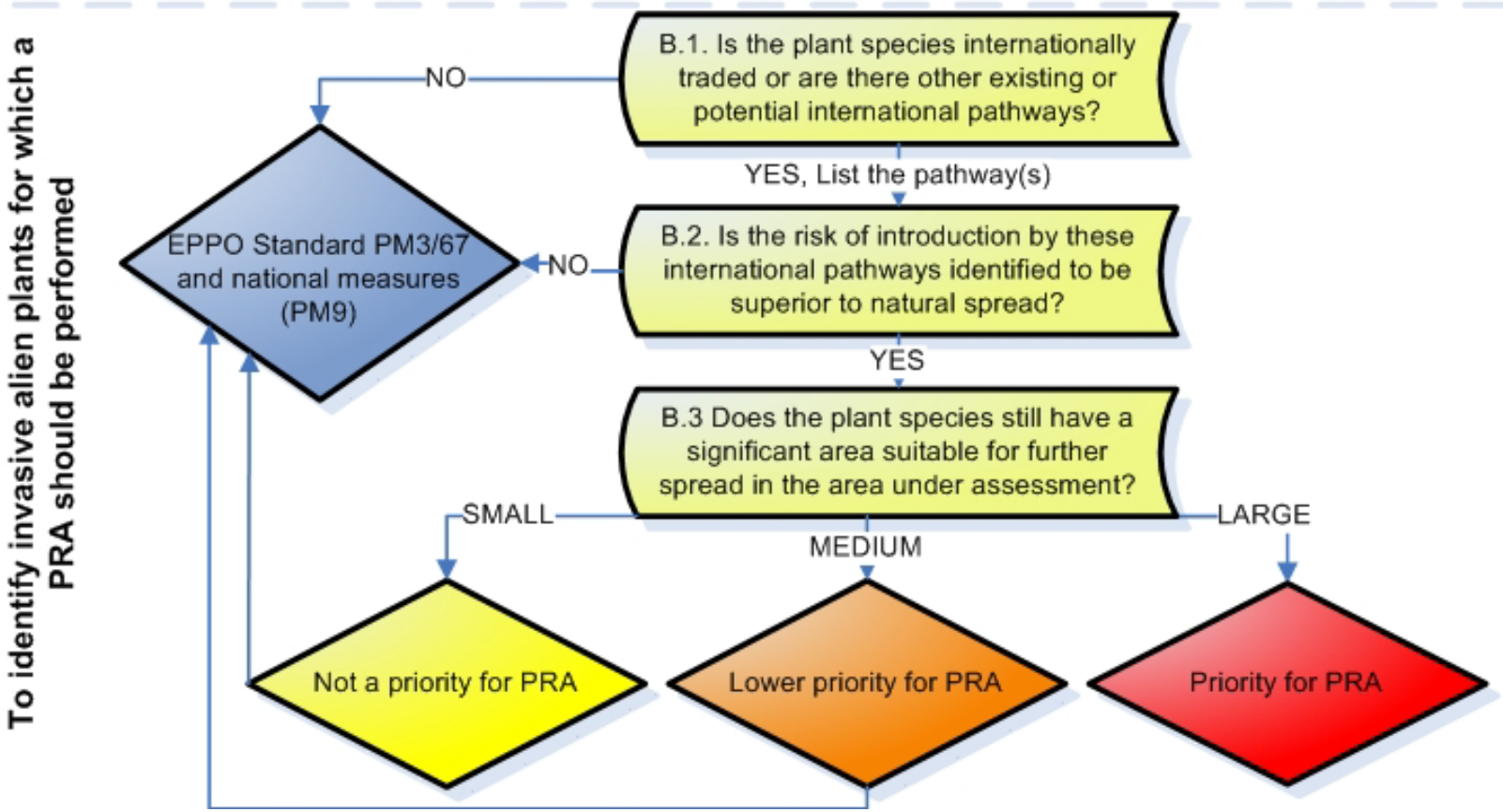
- A. to produce a reference list of IAP that are established or could potentially establish in the EPPO region.
- B. to determine which Invasive Alien Plants (IAP) have the highest priority for an EPPO pest risk analysis (= quick screening tool to identify potential quarantine organisms).

See EPPO PM 5/6(1) EPPO Prioritization process for invasive alien plants

Outcome of the first stage of the process: Invasiveness categories (Combination of spread and impacts)



Second stage of the process:
Identify (potential) invasive alien plants for which a PRA is a priority

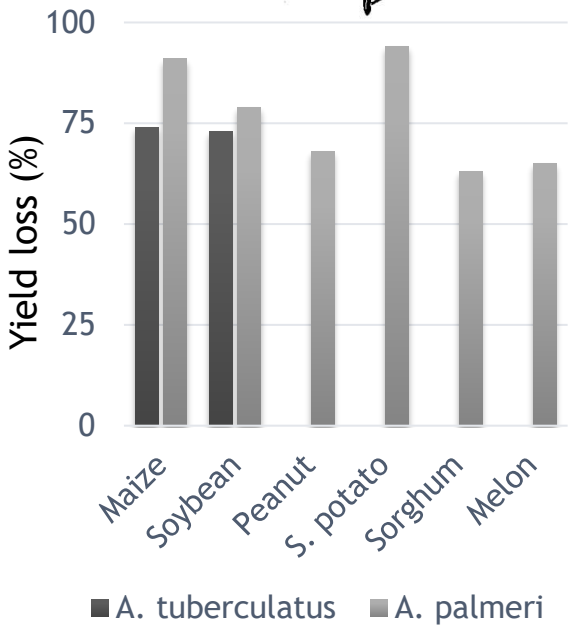


Amaranthus palmeri & A. tuberculatus

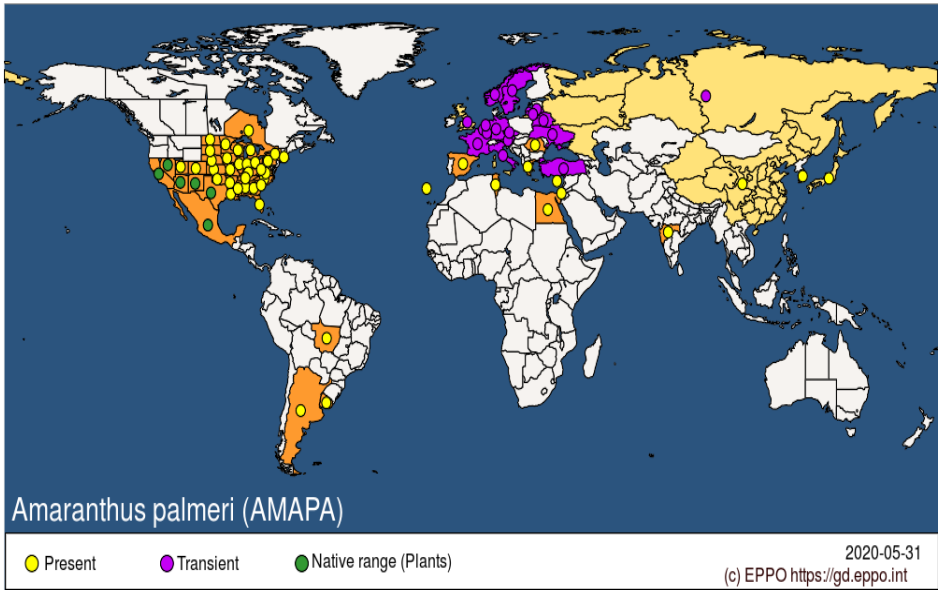
- **Family: Amaranthaceae**
- **Biology**
  - Summer annual herbaceous species native to North America: recent range expansion and problematic,
  - Dioecious *Amaranthus* species,
  - Prolific seed producers naturally dispersed by barochory (falling from the parent plant) and hydrochory (dispersal via water),
  - Seed bank:
    - *A. palmeri* 1.1. billion seeds ha $^{-1}$ 60 % viability after 12 months
    - *A. tuberculatus* 4 to 5 years in the soil in normal conditions,

  Both species low viability 17 years,
  - Herbicide resistant.
- **Can invade many summer crops**
- **Cause important yields losses**

& increased management costs



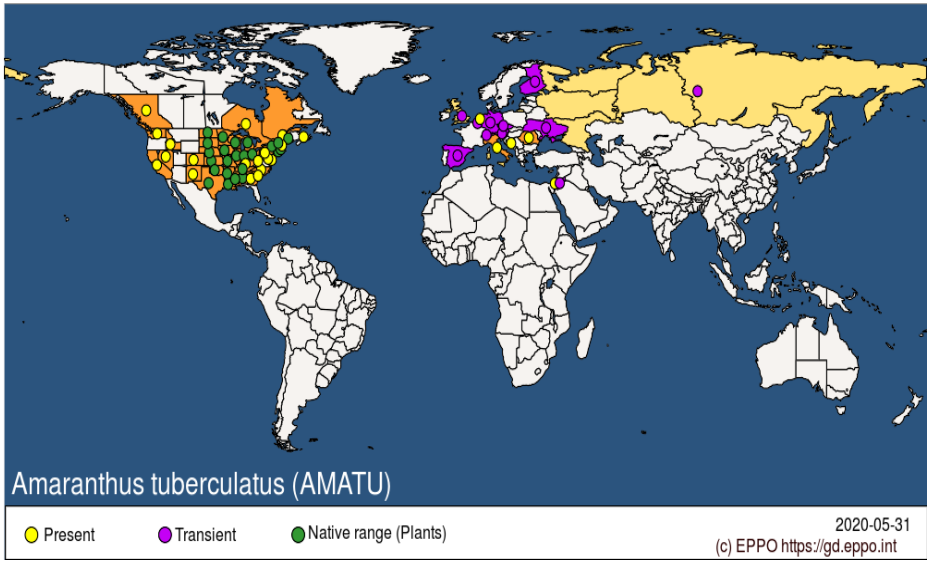
Amaranthus palmeri



Habitats

- Inland surface waters ruderal habitats,
- Mediterranean shrublands,
- Cultivated fields
- Abandoned arable land
- Habitat complexes (e.g. gardens, recreation areas)

Amaranthus tuberculatus



Habitats

- Inland surface waters
- Ruderal habitats, Hard surface areas (ports)
- Railway networks
- Cultivated fields
- Abandoned arable land

Conclusions → A2

A. palmeri

Endangered area: includes agricultural environments in the Mediterranean area, Middle East area and Central Asian area of the EPPO region

Phytosanitary risk: High with low uncertainty

A. tuberculatus

Endangered area: includes agricultural environments agricultural environments situated to the North and east of the Mediterranean sea, especially in the agricultural production areas in Spain and Portugal, South of France, Italy, Adriatic coast (incl. Croatia), as well as the Pannonian Basin and countries bordering the Black Sea and in central Asia

Phytosanitary risk: High with low uncertainty

Measures to reduce probability of entry

Possible pathways ***(in order of importance)***	**Measures identified**
Grains of [*]	Grains have been produced in a pest-free area for *Amaranthus* [species] established and maintained according to the requirements outlined below Or Grains have been sampled according to ISPM 31 and inspected, and *Amaranthus* seeds have been tested with an approved test, and the grain lot has been found free from [species] Or Grains have been devitalized according to an appropriate method
Seeds of [**]	Seeds have been produced in a pest-free area for [species] established and maintained according to the requirements outlined below Or Seeds have been sampled according to ISPM 31 'Methodologies for sampling of consignments' and inspected, and *Amaranthus* seeds have been tested with an approved test, and the seed lot found free from [species] *
Seed mixtures and native seeds	Seeds have been produced in a pest-free area for [species] established and maintained according to the requirements outlined below Or Seeds have been sampled according to ISPM 31 and inspected, and *Amaranthus* seeds have been tested with an approved test, and the seed lot found free from [species]
Used agricultural machinery and equipment	ISPM 41 'International movement of used vehicles, machinery and equipment' should be implemented

**A. palmeri*: *Arachis hypogaea*, *Glycine max*, *Helianthus annuus*, *Oryza sativa*, *Sorghum bicolor* and *Zea mays*
A. tuberculatus: *Glycine max*, *Phaseolus vulgaris*, *Sorghum bicolor* and *Zea mays*

*** A. palmeri*: *Glycine max*, *Gossypium hirsutum*, *Helianthus annuus*, *Oryza sativa*, *Sorghum bicolor* and *Zea mays*
A. *tuberculatus*: *Beta vulgaris*, *Glycine max*, *Gossypium hirsutum*, *Medicago sativa*, *Phaseolus vulgaris*, *Sorghum bicolor* and *Zea mays*

EPPO A1/A2 Lists of pests recommended for regulation as quarantine pests

Species	EPPO A1/A2 List
Alternanthera philoxeroides	A2 in 2015
Amaranthus palmeri	A2 in 2020
Amaranthus tuberculatus	A2 in 2020
Ambrosia trifida	A2 in 2019
Ambrosia confertiflora	A2 in 2018
Andropogon virginicus	A2 in 2018
Baccharis halimifolia	A2 in 2013
Cardiospermum grandiflorum	A2 in 2017
Cortaderia jubata	A1 in 2018
Crassula helmsii	A2 in 2006
Ehrharta calycina	A2 in 2018
Eichhornia crassipes	A2 in 2008
Gymnocoronis spilanthoides	A2 in 2017
Hakea sericea	A2 in 2018
Heracleum persicum	A2 in 2009
Heracleum sosnowskyi	A2 in 2009
Humulus scandens	A2 in 2018
Hydrocotyle ranunculoides	A2 in 2005
Lespedeza cuneata	A1 in 2018
Ludwigia grandiflora	A2 in 2011
Ludwigia peploides	A2 in 2011
Lygodium japonicum	A1 in 2018
Microstegium vimineum	A2 in 2015
Myriophyllum heterophyllum	A2 in 2015
Parthenium hysterophorus	A2 in 2014
Pistia stratiotes	A2 in 2017
Polygonum perfoliatum	A2 in 2008
Prosopis juliflora	A2 in 2018
Pueraria montana var. lobata	A2 in 2006
Salvinia molesta	A2 in 2017
Solanum elaeagnifolium	A2 in 2006
Triadica sebifera	A1 in 2018

EPPO's achievements are based on collaboration between experts from our region

Thank you for your attention

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