ACTION FA1003
East-West Collaboration for Grapevine Diversity Exploration and Mobilization of Adaptive Traits for Breeding

ACTION FA0807
Integrated Management of Phytoplasma Epidemics in Different Crop Systems

Phytoplasmas and viruses management in Grapevine Collections for Germplasm Conservation, Mobilization and Evaluation

SOFIA - 8 May, 2012

Grapevine propagation material movement and related phytosanitary rules in the EU

Carlo Frausin
Plant Protection Service of Friuli Venezia Giulia Region – ITALY
Grapevine propagation material movement and related phytosanitary rules in the EU

Targets of the presentation

- Understanding bases and goals of phytosanitary rules related to grapevine germplasm movement
- Assessing current quarantine phytosanitary procedures
- Suggesting possible updating
GOALS:

- Preventing introduction and spread of harmful organisms
- Promoting safe trade
- Promoting adequate control measures
SPS Agreement

Risk assessment

Members have the right to take phytosanitary measures necessary for the protection of plant life or health.

Measures must be based on:

- **Standards, Guidelines and Recommendations (IPPC);**
- **Scientifically based risk analysis/assessment**

(Art. 2: Basic Rights and Obligations - Art. 5: Assessment of Risk and Determination of the Appropriate Level of Sanitary or Phytosanitary Protection – Annex A: Definitions)

(Dir. 77/93/CEE)

- protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community.

- provides:
  - Regulated plants, plant products and regulated quarantine organisms within EU;
  - Criteria for the movement of plants and plant products in EU and Third Countries
Vitis L.


- Annex III, part A, no. 15

Import is prohibited from Third Countries
Annex I, part A, Sect. I - D), point 5

HARMFUL ORGANISMS WHOSE INTRODUCTION INTO, AND SPREAD WITHIN, ALL MEMBER STATES SHALL BE BANNED

  - a) Blueberry leaf mottle virus
  - b) Cherry rasp leaf virus (American)
  - c) Peach mosaic virus (American)
  - d) Peach phony rickettsia
  - e) Peach rosette mosaic virus
  - f) Peach rosette mycoplasm
  - g) Peach X-disease mycoplasm
  - h) Peach yellows mycoplasm
  - i) Plum line pattern virus (American)
  - j) Raspberry leaf curl virus (American)
  - k) Strawberry latent «C» virus
  - l) Strawberry vein banding virus
  - m) Strawberry witches' broom mycoplasm
lists of pests whose regulation is relevant for the whole of, or large parts of, the EPPO region

1. List of **A1 pests** (not present in the EPPO region).

2. List of **A2 pests** (present in the EPPO region but not widely distributed. I.e. absent from or not widely distributed in endangered areas in certain countries, where they are therefore subject to official control).

(First lists approved 1975)
...it is possible to interrogate the database to obtain specific lists of pests, by stipulating the host species, the commodity, and the countries of interest.
Quarantine pests for which *Vitis vinifera* is a host

**Major**
- Grapevine flavescence dorée phytoplasma
- Lobesia botrana
- Viteus vitifoliae
- Xylella fastidiosa
- Xylophilus ampelinus
- Grapevine flavescence dorée phytoplasma (as *Vitis*)

**Minor**
- Aleurocanthus woglumi
- Hyphantria cunea
- Phymatotrichopsis omnivora
- Viteus vitifoliae (as *Vitis*)
- Xylella fastidiosa (as *Vitis*)
- Xylophilus ampelinus (as *Vitis*)
- Aleurocanthus woglumi (as woody plants)
- Anastrepha fraterculus (as fruit trees)
- Anastrepha ludens (as fruit trees)
- Anastrepha suspensa (as fruit trees)
- Bactrocera dorsalis (as fruit trees)
- Bactrocera tryoni (as fruit trees)
- Ceratitis capitata (as fruit trees)
- Hyphantria cunea (as woody plants)
- Lymantria dispar (as fruit trees)
- Lymantria monacha (as woody plants)
- Planococcus lilacinus (as fruit trees)

**Unclassified**
- Otiorhynchus sulcatus
- Phakospora euvitis
- Tetranychus pacificus

**Incidental**
- Frankliniella occidentalis
- Trogoderma granarium
- Aleurocanthus woglumi (as *Vitis*)
- Ceroplastes destructor (as woody plants)

**Wild/Weed**
- Xylella fastidiosa (as woody plants)
<table>
<thead>
<tr>
<th>Harmful organism</th>
<th>Description</th>
<th>Present in EU</th>
<th>Present in Central Asia and Caucasus</th>
<th>efficient control methods available</th>
<th>Potential economic impact</th>
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<tbody>
<tr>
<td>Xylella fastidiosa</td>
<td>Bacteria</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>Very high</td>
</tr>
<tr>
<td></td>
<td>Pierce's disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Xylophilus ampelinus</td>
<td>Bacteria</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>high</td>
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<td></td>
<td>Bacterial blight</td>
<td></td>
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<tr>
<td>Agrobacterium tumefaciens</td>
<td>Bacteria</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>Effective</td>
</tr>
<tr>
<td></td>
<td>(crown gall disease)</td>
<td></td>
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<td></td>
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<tr>
<td>Coniella diploidiella</td>
<td>Fungi</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>Low-Effective</td>
</tr>
<tr>
<td></td>
<td>Grapevine white rot</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Eutypa lata</td>
<td>Fungi</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>Effective</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Guignardia bidwellii</td>
<td>Fungi</td>
<td>YES</td>
<td>NO (?)</td>
<td>YES</td>
<td>Low-Effective</td>
</tr>
<tr>
<td></td>
<td>Grapevine black rot</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudopezizatracheiphla</td>
<td>Fungi</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>Low-Effective</td>
</tr>
<tr>
<td></td>
<td>Rot-Brenner disease</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Rhacodiella vitis</td>
<td>Fungi</td>
<td>NO</td>
<td>NO</td>
<td>?</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Spotted necrosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Septoria ampelina</td>
<td>Melanose</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Harmful organism</td>
<td>Description</td>
<td>Present in EU</td>
<td>Present in Central Asia and Caucasus</td>
<td>efficient control methods available</td>
<td>Potential economic impact</td>
</tr>
<tr>
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<td>---------------------------</td>
</tr>
<tr>
<td><em>Margarodes prieskaensis</em>, <em>M. vitis</em>, <em>M. vredendalensis</em></td>
<td>Groun pearls Roots scale</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Effective</td>
</tr>
<tr>
<td><em>Pseudococcus comstocki</em></td>
<td>White Peach scale</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>Effective</td>
</tr>
<tr>
<td><em>Popillia japonica</em></td>
<td>Japanese beetle</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Low - effective</td>
</tr>
<tr>
<td><em>Daktulosphaira vitifoliae</em></td>
<td>Grapevine phylloxera</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>Low</td>
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<tr>
<td><em>Phenacoccus solenopsis</em></td>
<td>Cotton mealybug</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Low</td>
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<tr>
<td><em>Thaumatotibia leucotreta</em></td>
<td>Citrus codling moth - polyphagus Tortricidae</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Low</td>
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<tr>
<td><em>Aleurocanthus woglumi</em></td>
<td>Aleyrodidae Blue-grey fly</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Low</td>
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<tr>
<td><em>Bactrocera tryoni, B. invadens</em></td>
<td>Tephritidae Fruit fly</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>Low</td>
</tr>
<tr>
<td><strong>.........</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmful organism</td>
<td>Present in EU</td>
<td>Present in Central Asia and Caucasus</td>
<td>efficient vector known</td>
<td>Economic impact</td>
<td></td>
</tr>
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<td>------------------</td>
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<td>--------------------------------------</td>
<td>------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Ajinashika disease</td>
<td>NO</td>
<td>NO</td>
<td>none</td>
<td>Low (affecting only cv. Koshu)</td>
<td></td>
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<tr>
<td>Grapevine stunt</td>
<td>NO</td>
<td>?</td>
<td>Leafhopper Arboridia apicalis</td>
<td>significant</td>
<td></td>
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<tr>
<td>Summer mottle</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Blueberry leaf mottle virus</td>
<td>YES (Bulgaria, Hungary, Portugal)</td>
<td>NO</td>
<td>NO (pollen / bees??)</td>
<td>Low (Bulgarian latent strain: no symptom)</td>
<td></td>
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<tr>
<td>Grapevine Flavescence dorée and other GY</td>
<td>YES (Austria, France, Italy, Slovenija, Spain)</td>
<td>NO</td>
<td>Leafhopper Scaphoideus titanus</td>
<td>Very high</td>
<td></td>
</tr>
<tr>
<td>Peach rosette mosaic virus</td>
<td>NO</td>
<td>NO</td>
<td>Xiphinema americanum (Not present in UE)</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Tobacco ringspot virus</td>
<td>YES</td>
<td>YES (?)</td>
<td>Xiphinema americanum (Not present in UE) Thrips tabaci, others (?)</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Tomato ringspot virus (“Yellow vein” and other strains)</td>
<td>YES (restricted in Bulgaria, rare in other EU Countries)</td>
<td>YES (only Turkey, Iran)</td>
<td>Xiphinema americanum (Not present in UE)</td>
<td>Low</td>
<td></td>
</tr>
</tbody>
</table>
Vitis vinifera (VITVI)

Cut flowers or branches

Plants for planting

Georgia
Armenia
Azerbaijan
Russia
Turkey
Vitis (1VITG)

- Commission Directive 2008/61/EC of 17 June 2008 establishing the conditions under which certain harmful organisms, plants, plant products and other objects listed in Annexes I to V to Council Directive 2000/29/EC may be introduced into or moved within the Community or certain protected zones thereof, for trial or scientific purposes and for work on varietal selections.

- **Authorization procedures** set up by NPPO
- **Compliance with technical standards** (Annex I)
  - appropriate documentary evidence regarding the place of origin of the material;
  - Phytosanitary Certificate with specific Additional Declaration Certificato regarding 2008/61/EC;
  - material is held under quarantine containment conditions during introduction or movement.
- **NPPO surveillance** on compliance of quarantine measures adopted throughout the duration of the activities, by examination of the premises and activities at appropriate times;
- **Release / destruction**

ANNEX I - Authorization procedures

- GENERAL CONDITIONS
  - trial or scientific (non-commercial) purposes of authorized activities
  - Compliance of premises and facilities;
  - Quantity of material adequate to approved activities and available quarantine facilities
  - scientific and technical qualifications of the personnel by whom the activities are to be undertaken

ANNEX I - Authorization procedures

Evaluation of:
- materials, premises and activities;
- pest biology, possible spread pathways, interaction with the environment

- **Premises and facilities**
  ensure:
  - Pest containment and exclusion of the risk of spread
ANNEX I

- Premises and facilities - Control of:
  - Isolation
  - Regulated Access
  - Internal activity traceability
  - Safety and alarm systems
  - Hygiene and disinfection procedures in activity management
  - Analysis and indexing procedures
  - Disposal
  - Other specific measures depending on harmful organisms
1. General Requirements for PEQ Stations
2. Specific Requirements for PEQ Stations Location
   2.2 Physical requirements
   2.3 Operational requirements
      2.3.1 Staff requirements
      2.3.2 Technical and operational procedures
      2.3.3 Record-keeping
   2.4 Diagnosis and removal of quarantine pests or vectors
   2.5 Audit of PEQ stations
3. Completion of PEQ Process
APPENDIX 1: Requirements for PEQ stations
Official release

- Release from Quarantine following
  - Quarantine
  - Appropriate tests stating that the material is free from ANY HARMFUL ORGANISM not yet present in the EU.

(art. 2, pt. 4 Dir. 2008/61/EC: “The details of such quarantine measures shall be completed and inserted in Annex III to this Directive once the necessary technical information is available”
ANNEX III
QUARANTINE MEASURES INCLUDING TESTING ON PLANTS, PLANT PRODUCTS AND OTHER OBJECTS INTENDED FOR RELEASE FROM QUARANTINE

- Sect. III, Plants of *Vitis* L., other than fruits

“1. The plant material shall be subjected to appropriate therapy procedures, as laid down in FAO/IBPGR Technical Guidelines”
“FAO / IBPGR Technical Guidelines for the SAFE MOVEMENT OF GRAPEVINE GERMPLASM” edited by E.A. Frison and R. Ikin

- Food and Agriculture Organization of the United Nations
- International Board for Plant Genetic Resources
- International Council for the study of viruses and viruses diseases of the grapevine

(Ed. E.A. Frison and R. Ikin, 1991)
GENERAL RECOMMENDATIONS

TECHNICAL RECOMMENDATIONS
- Collecting and movement of seeds
- Collecting and movement of cuttings
- Collecting and movement of *in vitro* cultures
- Movement of pollen

THERAPY AND INDEXING STRATEGIES
Grapevine – therapy and indexing strategy for cuttings

- Dormant cuttings
  - HOT WATER TREATMENT
    - SHORT TERM INDEXING
      - LONG TERM INDEXING
        - RELEASE
    - DESTRUCTION
  - THERAPY
    - POS
    - NEG

- Green cuttings
  - Establishment
  - THERAPY
    - POS
    - NEG

FAO/IBPGR
CRITICAL POINTS:

1. INDEXING THROUGH GRAFTING ON INDICATOR PLANTS
   - COSTS
   - TIME

2. HOT WATER THERMOTHERAPY
   - NOT FULLY EFFECTIVE
   - IMPACT ON ENDOPHYTES
   - IMPACT ON GRAPEVINE PHENOTYPIC EXPRESSION (?)
Hot-water treatment: effect on fungi detections

Fig. 2. Fréquence d’isolement des espèces fongiques identifiées dans des barbues de Vitis vinifera cv. Chasselas, traitées ou non à l’eau chaude. L’intégralité des résultats sur les autres cépages peut être obtenue auprès des auteurs.

↓ = Fréquence d’isolement réduite. ↑ = Augmentation de la fréquence d’isolement.

★ = Espèces de champignons identifiées uniquement dans les plantes ayant subi un traitement à l’eau chaude.

= plantes contrôles. ● = plantes traitées à l’eau chaude.

Relations between Endophytic communities and Phytosanitary status

(D. Bulgari et al., 2011)
Is it possible a new quarantine strategy?

A. PRE-SHIPPING CONTROLS

1. **Field controls** on mother plant at the place of production, in appropriate timing;
2. **Selection** (exclusion of all symptomatic vines);
3. **ELISA / PCR tests** for grapevine known **harmful pathogens** (positive statement in phytosanitary certificate)
4. **Collecting** woody canes
5. **Dipping** in appropriate insecticide and fungicide (?)
6. **Consignment** with appropriate Phytosanitary Certificate (specific additional declaration)
a new quarantine strategy

B. POST-ENTRY CONTROLS

7. **Arrival in “Post Entry Quarantine Station”,** under official control by NPPO;

8. **Visual Testing** (insects, mites, ephyphytic bacteria and fungi);

9. Detecting, isolation and identification of epiphytic bacteria and fungi (e.d. **Biolog**)

10. **ELISA or RT-PCR** (for relevant grapevine harmful viruses, phitoplasmas on dormant cuttings);

11. (bench) **grafting** on appropriate rootstock

12. Production of **rooted plants**
a new quarantine strategy

B. POST-ENTRY CONTROLS

13. **Field planting** (in isolated conditions? Evaluation of vector’s presence)
14. **Monitoring** during experimental activity
a new quarantine strategy

C. FINAL TESTS for OFFICIAL RELEASE

- Environmental sequencing (Metagenomics + BLAST analysis or similar) to determine presence of harmful organisms not yet present in EU.

- Pest Risk Analysis (for Pests)

Further specific tests for trade purposes

- (see PM 4/8(2) EPPO “Pathogen-tested material of grapevine varieties and rootstocks”)
LEGENDA

- Areali di paradomesticazione
- Areali di paradomesticazione precoce
- Centro primario di domesticazione
- Centro secondario di domesticazione
- Centro terziario di domesticazione
- Centro quaternario di domesticazione
- Centro quinquenario di domesticazione

Da: F. Del Zan; O. Failla; A. Scienza, 2004
Illegal import of *Vitis* L. plants in EU 2007-2011 - Interceptions

Source: Europhyt
Illegal import of Vitis plants in EU - 2011
Intercepted....

Not intercepted...???