3rd European Conference on
Xylella fastidiosa and XF-ACTORS final meeting

What research needs in the outbreak areas? A nursery perspective for olive and fruit trees propagation

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The appearance and spread of the *Xylella fastidiosa* epidemic in Salento have brought out some fragilities and criticalities of the quarantine system and the nursery sector not only locally, but also at national and community level.

Leaving aside the regulatory and organizational aspects of the nursery industry and the phytosanitary authorities responsible for plant health surveillance and control, the implementation of scientific knowledge on specific research areas could be of great help in resolving the Xf emergency or caused by other harmful pests that unfortunately should occur and spread in Europe.

To facilitate compliance with the mandatory regulatory standards and to allow the competitiveness of the nursery industry, some of the aspects that should be addressed and analysed are listed below.

1. RAPID DIAGNOSTIC METHODS, EFFICIENT AND INEXPENSIVE

WHY ?

- Need of reliable tests in a short time in the nursery
- Support of production and marketing activities

EXPECTED RESULTS

- Availability of rapid diagnostic kits that can be used by authorized operators (art.91 Dir. 2016/2031) for checks in case of doubts and for early diagnosis.
- Self-control systems easier to be adopted by nurserymen
- VSPP - Voluntary System Preventive Pest, developed within the XF-actors project, easier to be applied.

2. THERMOTERAPY OF PLANT PROPAGATION MATERIALS

RULES

- UE Commission Implementing Decision 2015/2417 recognized thermotherapy as an approved method to allow the movement of vine plants within the Union, inside or outside the interested areas.

ACTIONS

- Testing and validation of the parameters for treatments of the other regulated and non-regulated plant species and different living part of plants (budwood, rootstocks, scions, etc.).
- Development of other alternative physical methods (e.g. steam, cryotherapy, etc.) in order to have different application solutions.

EXPECTED RESULTS

- Validated practices and methods to not affect the quality of the propagation materials
- Costumer plants quality guaranteed

3. RAPID PATHOGENICITY ASSAYS WITH BIOLOGICAL INDEXING AND BIOMOLECULAR TESTS OF CULTIVATED VARIETIES

RULES

- EU Commission Implementing Regulation 2020/1201 has reclassified the Xylella infected species by dividing them according to their susceptibility to the different strains of the bacterium.

EFFECT

- Severe limitations for the production and movement in demarcated areas for species that are immune to Xf (e.g. Citrus spp.) or belonging to the same genus - Prunus (European plum, Cino-Japanese plum and peach have never been reported).

EXPECTED RESULTS

- Rapid and efficient indexing protocol for large-scale investigations;
- Availability of official biomolecular analysis methods (NGS- Next Generation Sequencing; Deep Sequencing) in addition to the classic indexing test;
- Achievement the effective immunity to different Xf strains for species of agricultural interest.

4. IMPROVEMENT OF THE CHARACTERISTICS OF THE AUTOCHTHON GERMPLASM TO EVALUATE THE POTENTIAL CULTIVATION IN INFECTED AREAS

- Over the last few years, programs for the recovery of plant biodiversity have been developed at national and regional level, also funded by EU

WHY ?

- In order to make sense of the research programmes for the identification, description, sanitary assessment, collection and conservation ex situ of genetic resources, carried out in many regions.

EXPECTED RESULTS

- Indication on autochthon varieties suitable for growing in infected areas.

5. GERMPLASM SCREENING OF SUSCEPTIBLE SPECIES FOR THE SEARCH FOR SOURCES OF RESISTANCE AND FOR THE STATEMENT IMMUNITY / RESISTANCE / SUSCEPTIBILITY

WHY ?

- Increase the assessment of the olive varieties and germplasm susceptibility

EXPECTED RESULTS

- New sources of resistance to Xylella fastidiosa to be used in breeding programs.

6. OLIVE BREEDING PROGRAM FOR THE ESTABLISHMENT OF RESISTANT VARIETIES, INCLUDING NBT - CISGENESIS AND GENOME EDITING

ACTIONS

- Start a large-scale olive breeding program to constitute Xf-resistant varieties.
- Full genome transcription of the 2 resistant varieties Leccino and FS-17 is strategic and urgent to guide breeding activities.
- Using NBT, in order to constitute new plant varieties much faster than traditional genetic methods.

This is the unique mandatory way to guarantee a future to the Italian, Community and Mediterranean olive growing.

These activities can be also applied to other fruit species

7. PLANT PROTECTION BY MEANS AND INNOVATIVE METHODS WITH LOW ENVIRONMENTAL IMPACT

ACTIONS

- Implementing knowledge on the plant protection methods and procedures by physical rather than chemical means.
- Means and method for the biological control of the insect vectors

EXPECTED RESULTS

- Low environmental impact and ecological sustainability of the production processes
- Higher qualification of the plant propagating material to support biological and sustainable productions.

8. AUTOMATION

EXPECTED RESULTS

- Increase in the quality of the productions which must be established in isolated condition (insect-proof infrastructures).
- standardization of the processes with a reduction in processing times and costs.
- Reduction of water waste and the use of fertilizers and pesticides (precision farming).
- Reuse of the plastic containers (pot, tray, etc.) by disinfection processes
- Lower environmental impact of the full nursery industry

CONCLUSIONS

It is desirable that EU research policies, in addition to being oriented towards the immediate achievement of results (product), do not penalize basic knowledge, which is indispensable for their achievement.

On the behalf of the Italian nurseries
thanks for the opportunity to represent our ideas on research needs