The Agricultural Research Council (CRA)

... WHO WE ARE ...

... WHAT WE DO....
... third ranking institutional research body in Italy ...
Scientific and experimental competencies in the main agricultural and food chains:

- Cereals, grain food and forage;
- Olive, vegetable and seed oils;
- Fruit arboriculture;
- Wine;
- Citrus fruit;
- Horticulture and floriculture;
- Wood and industrial cultures;
- Meat and dairy;
- Agro-industry processes;

- **Plant protection.**
... 5000 ha experimental farms...
Founded in 1887

..... To carry out studies and researches regarding diseases and alterations of plants and plant products also in post-harvest, caused by parasites and weeds, by viruses and by unfavourable environmental factors, and develops methods and physical, chemical and biological tools able to prevent and control the diseases and alterations".
Human resources 2015

Permanent position

Researchers  25 UNITS
Technicians  19 UNITS
Administratives  18 UNITS

No permanent positions

Post doc, doctorates..  7 UNITA’
(1 BdS – 3 AdR)
Contracts  12 UNITA’
Diagnosis and development of diagnostic tools for the most important diseases of agricultural and forest environments.

Molecular and serological diagnostic methods

Growth on selective media

Assays on biological indicator plants
In the frame of Italian roles on phytosanitary aspects (D.L. n. 214 / August 19/2005) a national laboratory organization is defined as follows:

Central laboratory

Laboratories distributed on the territory

20 Regions
Network of laboratories distributed on the entire Italian territory

Tasks:

1. To establish official diagnostic protocols
2. To transfer official protocols to the Network
3. To train Network personnel
4. To maintain an official pathogens collection
5. To organize proficiency tests
6. To provide technical-scientific support to the competent authorities

CRA-PAV: laboratory accredited UNI ISO 17025 for seven test methods
Official agreement with Regional Plant Protection Units:

- Lazio
- Sicilia
- Abruzzo
- Umbria

Official samples received from:

- Other Regions:
  Liguria, Basilicata, Emilia-Romagna, Toscana, Campania, Molise
- Private companies (nursery)
Characterization, etiology and epidemiology of major crop diseases.

Studies on soil-borne and seed transmitted fungi

Forest decline

Urban tree diseases and control strategies.
The “Quick decline syndrome” appeared a few years ago in a restricted area near Gallipoli (Apulia, Italy).

Grapevine and Citrus were never found infected.
TOMATO  

Pepino mosaic virus PepMV

Sardinia: in 2001 and 2009
Sicily: since 2008
Campania: in 2011

- Surveys
- PepMV strain identification and characterization
- Epidemiological studies and diagnostic ringtest (PEPEIRA partner)
- Diagnostic protocol validation at national level
FD phytoplasma

S. titanus

Distribution map of stolbur isolates infecting grapevine

FD endemic (FD-C/D)
FD sporadic (FD-C)

FD-D

2011 New FD focus on Isle of Ischia

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Viruses cannot be directly controlled by chemical application on infected plants → Plant resistant to viruses

When virus resistance genes are not available in nature → Production of GM plants
Production of GMOs for virus resistance

In the ’90s CRA-PAV produced transgenic tomato plants resistant to CMV
CRA-PAV has produced transgenic model plants resistant to the quarantine *Plum pox virus*, the etiological agent of sharka.

Plants are resistant to all PPV strains including the Egyptian PPV strain El Amar.

RNA interference technology (RNAi)

→ no transgenic proteins are produced for PPV resistance

→ consumers’ acceptance
Pest management

Conventional:
Evaluation of pesticides: capability, persistence, residues

Integrated control:
Optimization of pesticides use
Reduction of chemical residues
Reduction of environment impact (water, soil, crop, air)

Organic farming:
Reduction of the use of plant protection products
Reduction of chemical residues
Reduction of environment impact
Identification of natural products for pathogen control
Use of natural compounds to control plant diseases

Control of powdery mildew in zucchini using tea tree oil

Seed treatment with essential oils: clave oil, tea tree oil, thimo oil

Soil amendments using brassica green manures or Trichoderma spp to control soil plant pathogens
Development of innovative techniques to free plant germoplasm from viruses

*In vitro* micrografting applied to stone fruits

**artichoke**

**grapevine**
OTHER ACTIVITIES SUPPORTING THE NATIONAL PLANT PROTECTION ORGANIZATION
Culture collections allow to maintain microbial diversity

To preserve several isolates or strains of the same pathogen is important for:

- Optimization of diagnostic protocols
- Production of resistant germoplasm
- Pest Risk Analysis

The study of the variability of pathogen population helps in understanding the evolution of the considered micro-organism
The Center takes part in National certification services and contributes in defining the protocols for propagating stocks.
Nuclear stock

Apricot 38
Peach 32
Plum 37
Wolnudt 8
Almond 8
Cherry 9
Olive 33
Rootstocks 6
Grapevine nuclear stock

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