Plant Health Diagnostic Laboratories in Hungary

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National Food Chain Safety Office, Hungary
National Food Chain Safety Office (NFCSO-NÉBIH)

- Ministry of Agriculture
- The Central Agricultural Office (CAO) and the former Hungarian Food Safety Office were integrated into the National Food Chain Safety Office -- 15th March 2012.
NÉBIH main divisions:

- Animal Health and Animal Welfare Directorate
- Directorate of Veterinary Medicinal Products
- Veterinary Diagnostic Directorate
- Directorate of Wine Qualification
- Institute for Agrobotany
- Hungarian Forest Management
- Animal Breeding Directorate
- Food hygiene, food safety and food quality
- Feed safety, feed hygiene and feed quality
- Directorate of Plant Protection, Soil Conservation and Agro-environment
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- Department of Plant Protection
- Department of Quality Control of Fruits and Vegetables
- Department of Authorisation
- Department of Evaluation
- Department of Soil Conservation
- Department of Phytosanitary Measures
- Plant Health Diagnostic Laboratories
Plant Health Authority in Hungary

- Min. Agriculture
- **NÉBIH**
- Dir. of Plant Protection, Soil Conservation and Agro-environment
- Dep. of Phytosanitary Measures &
- PH Diagnostic Labs
- Min. of Public Administration and Justice
- Governmental Office (19)
- Plant Prot. and Soil Cons. Service
- PP & PH Inspectors
Diagnostic of quarantine and non-quarantine pests in 3 authorized labs:

- Plant Health and Molecular Biology Laboratory, Budapest (PHMBL)
- Bacteriology Laboratory, Pécs (PBL)
- Virology Laboratory, Velence (VVL)

All three labs got the National Reference Lab. status from the Ministry of Rural Development (NPPO) in November, 2012
Small country, small lab dilemma:

- Survey of Q-pests
- Certification (propagation material, grapevine, stone fruits, viruses)
- Service for companies, farmers, owners
- NRL functions:
  - diagnostic protocols adaptation, validation;
  - coordination and control of county labs;
  - trainings for county labs and PH inspectors
  - proficiency tests & test performance studies
  - research, development; staff trainings, publication activities
PHMBL

Diagnostic of quarantine and non-quarantine plant pathogen:

- arthropods (insects)
- fungiies
- nematodes
- phytoplasmas
- viruses & viroids
- research and development
Diagnostic of quarantine and non-quarantine plant pathogen BACTERIA:

- *Clavibacter michiganensis* spp.
- *Pantoeae stewartii*
- *Ralstonia solanacearum*
- *Xanthomonas arboricola*, *X. campestris*, *X. fragariae*
- *Erwinia amylovora*
- *Xylophilus ampelinus*
Fruit trees & small fruits (berrys) propagation material control for quarantine and economically important pathogen viruses -- diagnostics based on bioassays and ELISA tests

ELISA tests for arabial crops: Pea-seed borne mosaic virus, Pea enation mosaic virus, Maize dwarf mosaic virus, Barley stripe mosaic virus
Plant Health and Molecular Biology National Reference Laboratory (PHMBL)
IT & Diagnostic Training Room
Quarantine Unit

Phytotrons
PHMBL Accreditation  
(ISO/IEC 17025: 2005)

ELISA test
• Plum pox virus (=PPV),
• Prune dwarf virus (=PDV)
• Prunus necrotic ringspot virus (=PNRV)

GMO corn
PHMBL Units

Staff: 8 specialists + 2 technician

- Entomology
- Nematology
- Mycology
- Molecular unit
- ELISA unit
PHMBL
Entomology

- Anoplophora spp.
- Cacoeciamorpha pronubana
- Dryocosmus kuriphilus
- Liriomyza spp., Bemisia tabaci, Thrips palmi
- Rhagoletis cingulata, R. completa (county labs)
- Scaphoideus titanus (county labs)
- Rhynchophorus ferrugineus
- Monochamus spp. Vector
PHMBL
Nematology

- Aphelenchoides spp.
- Bursaphelenchus xylophilus
- Ditylenchus destructor & D. dipsaci
- Globodera rostochinensis & G. pallida
- Meloidogyne spp.
- Longidorus spp.
- Radopholus similis
PHMBL
Mycology

- Gibberella circinata
- Monilinia fructicola
- Mycosphaerella dearnessii & M. pini
- Phytophthora rubi, P. fragariae, P. ramorum, P. kernoviae
- Plasmopara halstedii
- Synchytrium endobioticum
- Tilletia indica & T. controversa
PHMBL
Molecular unit/Phytoplasmas

- Apple proliferation phytoplasma
- Apricot chlorotic leafroll phytoplasma
- Grapevine Flavescence dorée phytoplasma
- Peach X-disease phytoplasma
- Pear decline phytoplasma
- Potato stolbur phytoplasma
PHMBL Units
Molecular unit/Viroids & Viruses

- Chrysanthemum stunt viroid
- Potato spindle tuber viroid
- Tomato apical stunt viroid
- Plum pox virus
- Prunus necrotic ringspot virus
- Prune dwarf virus
- Tomato chlorosis virus
PHMBL Molecular unit
Nematodes, Insects & Fungies

- Bursaphelenchus xylophilus
- Globodera rostochinensis & G.pallida
- Meloidogyne spp.
- Longidorus spp.
- Rhagoletis completa
- Tilletia indica & T. controversa
PHMBL
ELISA unit/Viruses

Certification – plants for plantings:
• GFLV, ArMV, GLRaV 1,2,3; GVA, GVB (grapevine)
• PPV, PDV, PNRSV (stone fruits)
• PepMV (tomato)
• TSWV, TYLCV (tomato and pepper)
Research & Development

- Research with Hungarian Research Institutions and Universities:
  - *Drosophila suzukii*
  - FD and its vector, *Sc. titanus*
  - *Rhagoletis completa*
  - *Rhagoletis cingulata & Rhagoletis cerasi*
Research & Development

- EPPO Panels:
  - Entomology;
  - Viruses and Phytoplasma;
  - Fungi;
  - Diagnostics and Quality Assurance Panel
Research & Development

• **COST** Action FP1406 project: Pine pitch canker - strategies for management of *Gibberella circinata* in greenhouses and forests (PINESTRENGTH)

• **COST** Action FA1407 – Next Generation Sequencing in diagnosis of plant viruses

• **COST** Action FP1102 project - Determining Invasiveness And Risk of Dothistroma (DIAROD)
Research & Development

• HU is a **EUPHRESCO** member since 2014
• 7 research topics (PHMBL-5; VVL-1; PBL-2)
• 1 topic as a coordinator, genomic sequencing (F-172)
Dryocosmus kuriphilus and Torymus sinensis – classical biocontrol
Thanks for attention!