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Termőföldtől az asztalig

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**



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 & PP & PH Inspectors
- PH Diagnostic Labs
- Min. of Public Administration and Justice
- Governmental Office (19)
- Plant Prot. and Soil Cons. Service



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



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Diagnostic of quarantine and non-quarantine plant pathogen:

- arthropods (insects)
- fungies
- nematodes
- phytoplasmas
- viruses & viroids
- **research and development**



PBL



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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)



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IT & Diagnostic Training Room





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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



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Staff: 8 specialists + 2 technician

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



PHMBL

Entomology



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- *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



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Nematology



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



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Mycology



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- *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



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Termőföldtől az asztalig

- *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



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



Research & Development



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- **EPPO Panels:**
 - Entomology;
 - Viruses and Phytoplasma;
 - Fungi;
 - Diagnostics and Quality Assurance Panel



Research & Development



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- **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



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- HU is a **EUPHRESKO** member since 2014
- 7 research topics (PHMBL-5; VVL-1; PBL-2)
- 1 topic as a coordinator, genomic sequencing (F-172)



Research & Development



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Dryocosmus kuriphilus and Torymus sinensis – classical biocontrol





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Thanks for attention !

