Phytosanitary diagnostics - an essential element of National Plant Protection Service activity in the light of the EU membership

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SPHSIS as a national authority is in charge of:

- ✓ supervision of the plant health
- ✓ prevention a risk related to the use and marketing of plant protection products
- ✓ supervision of production and marketing of seed and propagating material

The main duty of the PHSIS in plant health field

- ✓ **Prevention of the introduction and spread of harmful organisms within Poland and EU**
- ✓ **In this process the support of phytosanitary diagnostic to the Plant Protection Service is crucial**

The tasks of the Service are realized by the following bodies:

- ✓ **<u>at central level</u> - the Main Inspector, with the aid of Head Office**
- ✓ **<u>at regional level</u> - the Voivode, with the aid of the Voivodeship Inspector acting as a head of Voivodeship Inspectorate of SPHSIS, being a part of joined voivodeship administration**

Diagnostic activity of the SPHSIS

The laboratory network of SPHSIS is prepared for realization of the official task in the field of plant health and seeds

Diagnostic activity of the SPHSIS

Laboratory analyses are performed according to:

- **national legislation**
- **acquis communautaire**
- **international standards**

  (OECD, ISPM, ISTA, EPPO)

Diagnostic activity of the SPHSIS

- phytosanitary diagnostics
- estimation of seed material
- analysis of plant protection products residues
- GMOs analysis

Diagnostic activity of the SPHSIS

Three-level diagnostic activity:

- workstations at:
  - ✓field units - 271
  - ✓border inspection posts - 13
- Voivodeship Laboratories - 16
- Central Laboratory of MIPHSI

Diagnostic activity of the SPHSIS

Order of the Main Inspector No. 28/2011

„General rules of performing laboratory analyses of plants, plant products and objects for the presence of harmful organisms”

Diagnostic workstations at field units

- ✓ Preliminary estimation of health status of plant material and products
- ✓ Sampling for diagnostic purposes
- ✓ Simple diagnostic methods
  - ✓ visual examination
  - ✓ microscopic analysis
- ✓ Detection and identification of some insects, nematodes and fungi

Diagnostic network of SPHSIS - BIPs

Diagnostic workstations at BIPs

Sampling in the framework of official inspection of imported consignements

Visual examination of samples.

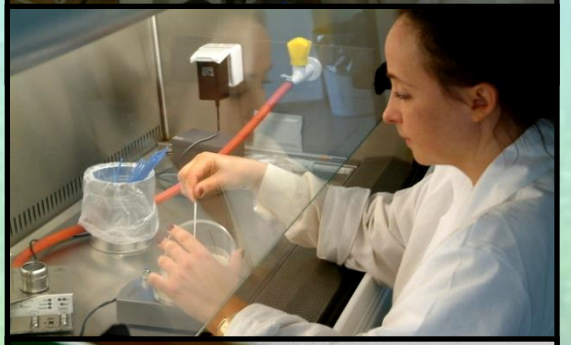
Dispathing samples to laboratories of SPHSIS for specialistic analysis.

Simple, fast diagnostic methods

Voivodeship Laboratories

- Broad scope of diagnostics of plant material in order to detect and identify plant pests, especially quarantine objects
  - plant material marketed internally within EU
  - material of import origin
  - intended for export
  - surveilances of the territory of Poland
- Estimation of seed material and seed potatoes

Voivodeship Laboratories

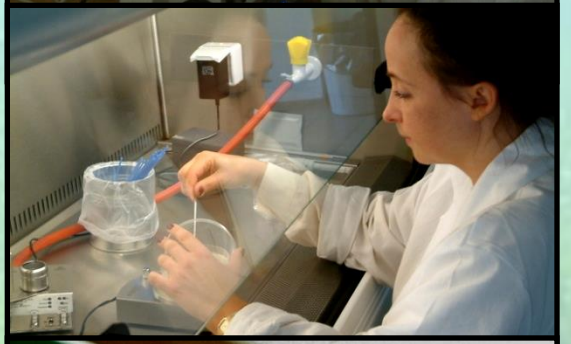


The most routine analyses in the framework of the official inspection.

Specialistic equipment.

Broad scope of testing methods.

Voivodeship Laboratories



Methods used :

- **microscopy**
- **serological**
  - ✓ **IF**
  - ✓ **ELISA**
- **plating method**
- **biological tests**
- **biochemical tests**
  - ✓ **R-PAGE**
- **molecular**
  - ✓ **FISH**
  - ✓ **PCR**

Voivodeship Laboratories

Central Laboratory at Toruń

Divisions:

- GMO Analysis
- Analysis of Plant Protection Products Residues
- Phytosanitary Diagnostics

Central Laboratory in Toruń

GMO Analysis Division

Tasks:

- ✓ **testing of conventional seed material for the presence of genetic modifications (1000 corn and rape samples per year)**

Methods:

PCR, Real-TimePCR

Central Laboratory in Toruń

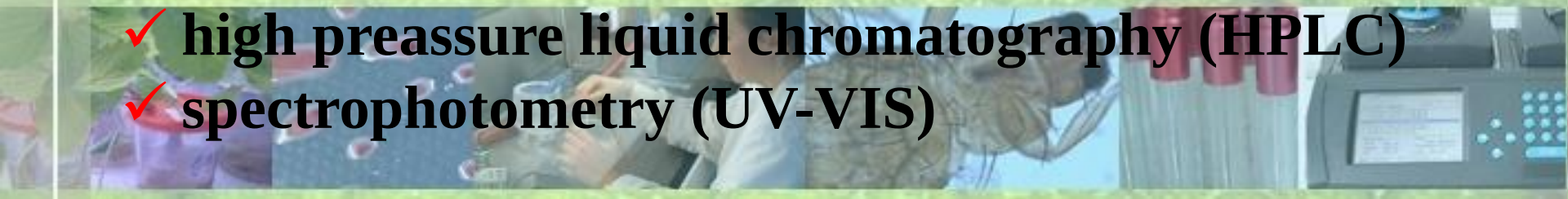
Analysis of Plant Protection Products Residues Division

Tasks:

- ✓ analyses within official inspection of plant products– 600-700 fruit and vegetable samples per year
- ✓ analyses in the case of incidents

Methods:

- ✓ gas chromatography (CG, CG/SM)
- ✓ high preassure liquid chromatography (HPLC)
- ✓ spectrophotometry (UV-VIS)



Central Laboratory in Toruń
Phytosanitary Diagnostics

Technical sections:

- Bacteriology
- Virology
- Mycology
- Entomology
- Nematology
- Molecular biology

Central Laboratory in Toruń
The laboratory with a reference function

Co-ordination and supervision of the laboratories of the diagnostic network

- ✓ **confirmation of testing results**
- ✓ **controls, including methods implementation and surveillance of their proper use**
- ✓ **training courses**
- ✓ **proficiency testing**
- ✓ **test performance studies**
- ✓ **verification of testing results**

Proficiency tests organized by CL in 2014

- ✓ ***Synchytrium endobioticum***
- ✓ ***Globodera*** **spp.**
- ✓ ***Longidorus*** **and** ***Xiphinema***
- ✓ ***Clavibacter michiganensis*** **ssp.** ***sepedonicus***
- ✓ ***Potato spindle tuber viroid*** **(PSTVd)**
- ✓ ***Frankliniella occidentalis***

Participation in external PT (eg. FAPAS)

Central Laboratory in Toruń
Phytosanitary Diagnostics

Laboratory analysys are performed with the use of wide range diagnostic techniques

- ✓ **Fatty acid analysis of bacteria with gas chromatography**
- ✓ **Detection and identification of various pests with the use of molecular techniques**
- ✓ **Co-operation with research units and laboratories in the field of implementation of new diagnostic methods**

Diagnostic activity of the SPHSIS

Phytosanitary laboratories are obliged to observe the rules determined by:

- **Phytosanitary safety requirements – Directive 2008/61/EU, EPPO PM 3/64 (1), national regulations**
- **General requirements for the competence of testing laboratories - EN ISO/IEC 17025:2005**
- **safety and health at work regulations**
- **other regulations on environment protection e.g. sewage and solid chemical waste utilization**

Diagnostic activity of the SPHSIS

It is very important for official laboratories to confirm their competence by accreditation, so quality assurance system according to EN ISO/IEC 17025 is being implemented intensively.

Up to day 12 of 17 laboratories of the Service obtained the accreditation certificate.

Moreover, two Seed Testing Laboratories have ISTA accereditation.

The scope of accreditation of Central Laboratory

- ✓ *Erwinia amylovora* - **DASI-ELISA, IF**
- ✓ *Cms* – **IF, FISH, FAP**
- ✓ ***R. solanacearum* – selective isolation, IF, PCR**
- ✓ ***Pantoea stewartii* subsp. *stewartii* – IF**
- ✓ ***Xanthomonas vesicatoria* – IF**

The scope of accreditation of Central Laboratory

- ✓ *Colletotrichum acutatum* – **morphometric method**
- ✓ *Phytophthora ramorum* **- morphometric method**
- ✓ *Synchytrium endobioticum* **– Jellem method**

- ✓ *Plum pox virus* **- DAS-ELISA, IC-RT-PCR**
- ✓ *Phytoplasmas, the group 16SrX* **- PCR/RFLP**

The scope of accreditation of Central Laboratory

- ✓ *Diabrotica virgifera* - morphometric method
- ✓ *Globodera* spp. – extraction and morphometric method, PCR
- ✓ *Bursaphelenchus xylophilus* - extraction and morphometric method
- ✓ *Longidorus i Xiphinema* - extraction and morphometric method

GMO, PPR – flexible scope covering the whole activity

Gradual improvement of the diagnostic capability of the service

- rapid progres in the field of research and development of new modern diagnostic technique
- new threats
- restrictive requirements of international standards

force the phytosanitary diagnostic laboratory to make gradual improvement, including:

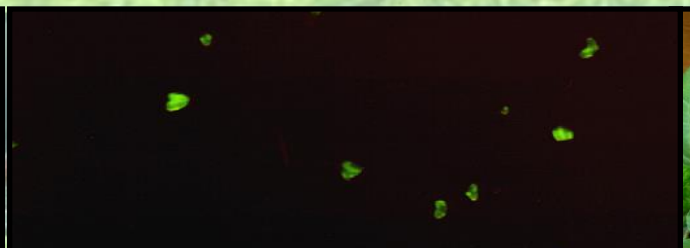
- modernization of the existing facilities
- enhancement of the professionalism of diagnostic staff

Diagnostic activity of the SPHSIS
(phytosanitary area)

	Number of samples	Number of analyses	CL-samples	CL-analyses
2010	159 151	198 375	9 346	
2011	145 010	184 954	6 656	
2012	146 817	189 018	6 800	
2013	159 760	198 069	6 850	
2014	170 858	211 785	6 518	14 174

Number of samples

Bacteriology	2013	2012	2011	2010	2009	2008	2007
Cms	15.249	17.675	17.064	15.807	17.720	18.872	20.841
R. solanacearum	15.251	19.569	18.728	15.644	20.437	18.631	23.293
Erwinia amylovora	274	249	480	451	572	477	563
X. campestris pv. *phaseoli*	221	285	293	110	303	298	244
X. campestris pv. *vesicatoria*	91	88	114	56	57	87	125
Cmm	83	40	54	28	50	75	132



Number of samples

Nematology	2013	2012	2011	2010	2009	2008	2007
Globodera spp. - gleba	43.769	42.027	45.997	53.185	28.183	23.721	25.889
D. destructor - ziemniak	6.400	7.052	4.828	4.016	3.855	3.972	4.168
Meloidogyne spp. (kwar.)	3.205	3.713	4.031	4.096	4.175	6.692	6.611
D. dipsaci - gleba	2.382	3.574	2.583	2.410	2.083	2.673	2.524
Longidorus i *Xiphinema*	2.018	1.578	1.922	2.103	2.109	2.254	2.688
Bursaphelenchus xylophilus	1.985	1.233	1.390	1.824	1.980	1.724	2.285

Number of samples

Mycology	2013	2012	2011	2010	2009	2008	2007
S.endobioticum (gleba)	41.138	40.777	38.391	45.858	32.920	33.280	30.028
P. ramorum	423	399	464	572	508	936	1.765
P. fragariae var. *fragariae*	357	278	276	612	422	519	746
Monilinia fructicola	71	96	107	180	0	0	0

Number of samples

Virology	2013	2012	2011	2010	2009	2008	2007
PPV	16.160	11.026	11.064	10.896	11.892	13.372	11.697
ApMLO	2.679	2.543	2.335	2.429	2.906	3.334	8.036
PepMV	301 owoce 87, nasiona 152, rośliny 62	346 owoce 156, nasiona 116, rośliny 74	469	443	636	2.365	7.961
PSTVd	283	226	438	199	317	231	349
CSVd	270	204	194	331	193	208	245

Number of samples infected with quarantine pests

Harmful organism	2013	2012	2011	2010	2009	2008	2007	2006
Clavibacter michiganensis ssp. *sepedonicus*	1.009	1102	1.005	1.000	1.564	1.914	1.716	2.467
Globodera rostochiensis	224	172	365	251	182	175	386	417
Diabrotica virgifera	62	47	81	22	44	346	137	231
Plum pox virus	122	107	50	63	50	78	70	93
Chrysanthemum stunt viroid	14	3	0	2	0	0	0	49
Synchytrium endobioticum	15	8	36	16	10	15	4	26
Clavibacter michiganensis ssp. *michiganensis*	0	0	0	0	0	2	6	21
Ditylenchus dipsaci	8	12	53	58	8	37	12	21
Pepino mosaic virus	28 owoce 20, rośliny 6, nasiona 2	59 owoce 35, rośliny 24	52	71	12	351	363	15

Number of samples infected with quarantine pests

Harmful organism	2013	2012	2011	2010	2009	2008	2007	2006
Longidorus spp.	83	9	50	123	13	40	20	15
Ditylenchus destructor	10	21	15	15	0	17	15	19
Xanthomonas campestris pv. *phaseoli*	41	31	11	4	11	7	14	10
Erwinia amylovora	0	5	7	2	3	0	5	22
Phytophthora fragariae var. *fragariae*	0	1	1	3	3	2	1	3
Apple proliferatiom MLO	3	5	5	9	3	10	3	2
Phytophthora ramorum	2	0	0	7	0	7	3	0
Monilinia fructicola	13	0	0	12	1	0	0	0

Thank you

for your attention