

The background of the slide is a collage of various fruits. On the left, there is a large bunch of green grapes. In the top center, there are two ripe red strawberries. On the top right, there is a cluster of blueberries. In the bottom left, there is a bunch of blackberries. In the bottom center, there are several red apples. On the bottom right, there is a green hazelnut in its husk. The text is overlaid on this collage.

**Scientific competences
and research potential
of University of Life Science
in Lublin**

**(Eastern Poland)
in control of pest and pathogens
affecting fruit crops**

Phytopathologist

Department of Plant Protection and Quarantee



DR AGNIESZKA JAMIÓŁKOWSKA

- **Research interests:**

- Biological control of vegetables and fruit crops**
- Effect of biological products on the plant immunology system**
- Soil-born fungi**

Entomologist

Department of Entomology



DR HAB. MAGDALENA GANTNER

- Major research topics:
 - ❑ I specialize in all aspects of hazelnut pest control (management, biological control, resistant cultivars, economics) and I work with commercial producers who grow this plant in Poland
 - ❑ my research has been recently expanded to include pests of other minor fruit crops as well as herbal plants
 - ❑ I am interested in understanding of physiological and biochemical interactions between the pest and the host plant related to resistance: induced resistance, plant defense responses



University of Life Sciences in Lublin

2012

FACTS AND FIGURES

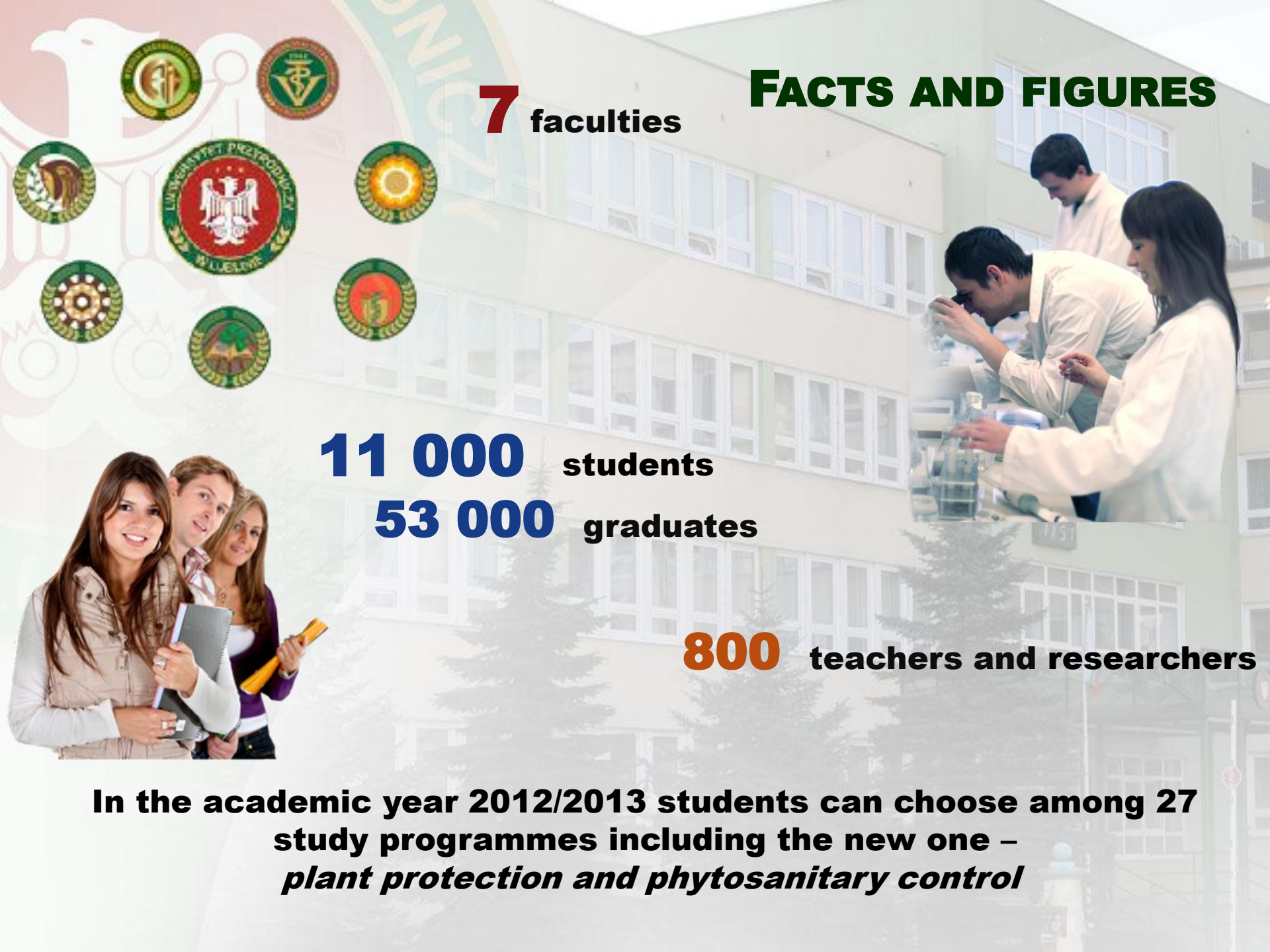
7 faculties

11 000 students

53 000 graduates

800 teachers and researchers

In the academic year 2012/2013 students can choose among 27 study programmes including the new one – *plant protection and phytosanitary control*



Facilities and equipment



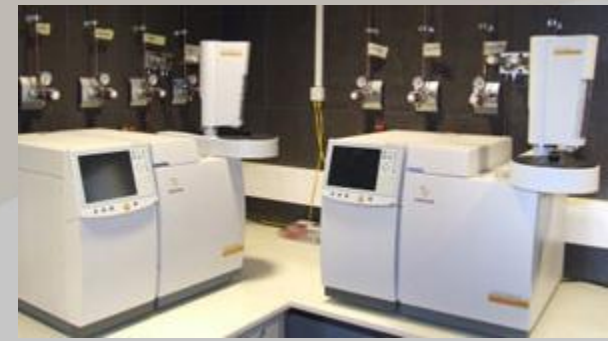
Courses are conducted in well equipped laboratories, lecture halls and seminar rooms.



Central Laboratory of Agriecology and experimental farms

Most Departments have their own laboratories, allowing to perform the necessary analysis and researches related to the specialization of the unit.

The high level of academic staff, well-equipped laboratories, including accredited Central Laboratory of Agriecology, guarantee the highest level of conducted investigations.



Scientific research is also conducted in the experimental farms in Bezek Czeslawice, Uhrusk and Felin



PLANT PROTECTION

Department of Entomology

Department of Phytopathology and Mycology

Department of Plant Protection and Quarantine



Laboratories:

- Molecular Biology
- Phytopathology
- Entomology

- Research staff:
- 4 Full Professors
 - 3 Assistant Professors
 - 13 Assistants and Teachers
 - 3 PhD students





Our achievements



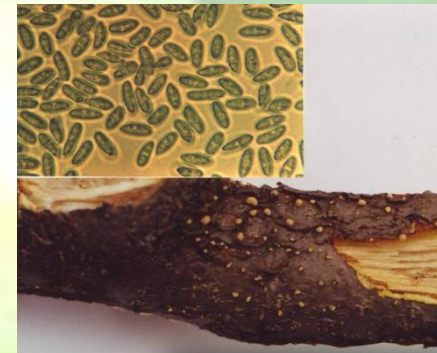
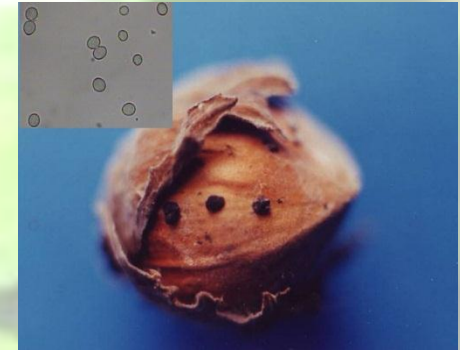
Pests of hazel (*Corylus*)



- ✓ species composition of the fauna of hazelnut pests were determined
- ✓ the role of main beneficial insects for natural pest control was defined
- ✓ the irregularity of species occurrence, depending on weather conditions was estimated
- ✓ the economic status of hazelnut pests in Poland was calculated
- ✓ the sources of susceptibility of the cultivars of hazelnut to the major pests in comparison with their crop productivity was identified
- ✓ the most resistant hazel cultivars to the major pests were designated

Diseases and pathogens of hazel (*Corylus*)

- ✓ less known diseases and pathogens (*Monilia coryli*, *Botrytis cinerea*, *Cytospora corylicola*, *Cryptosporiopsis coryli*, *Phyllactinia corylea*) were elaborated
- ✓ the optimal conditions for the growth and development of *Monilia coryli* on hazel were designated
- ✓ the most resistant hazel cultivars to *Monilia coryli* were designated
- ✓ it was found that *Monilia coryli* inhabited not only fruit but also inflorescens and fruit germs
- ✓ it was proved that the pericarp discoloration as well as blackening and softening of kernels were caused by pectolytic strains of *Bacillus* spp.
- ✓ it was found that fungi strains and epiphytic bacteria had limited the growth and sporulation process of most dangerous pathogens of hazel



Pests of highbush blueberry (*Vaccinium corymbosum* L.)

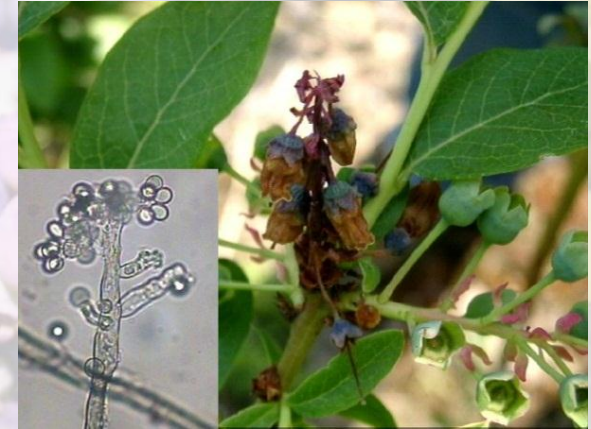


- ✓ species composition of insects occurring on highbush blueberry plants was determined
- ✓ ecological indexes for two orders of insects – Lepidoptera and Coleopteran (population dynamics, domination, frequency and food preferences) were established
- ✓ the role of natural enemies of caterpillars damaging leaves of blueberry bushes has been examined
- ✓ the sources of susceptibility of the cultivars of blueberries to injurious caterpillars were put under the investigation

Diseases and pathogens of highbush blueberry (*Vaccinium corymbosum* L.)



- *Topospora myrtilli*, *Botrytis cinerea*, *Phomopsis archerii*, *Cytospora* spp., *Monilinia fructigena*), diseases and pathogens of blueberry shoots and fruit were identified



- *Topospora myrtilli* a species unknown in Poland was considered as the most dangerous pathogen causing shoot blight



- morphological features (SEM) of *T. myrtilli*, its life requirements and weak competitive abilities were designated

- it was proved that some biotechnological preparations may inhibit the growth and sporulation of *T. myrtilli*





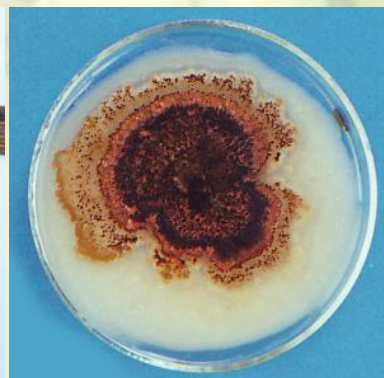
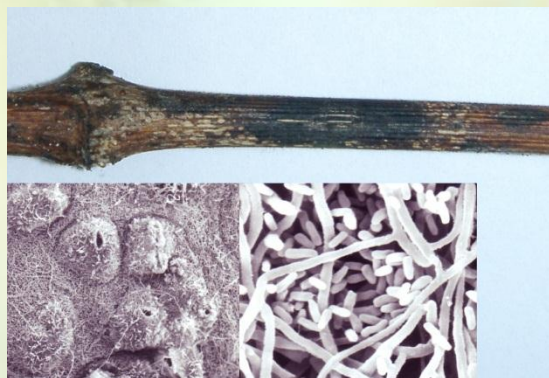
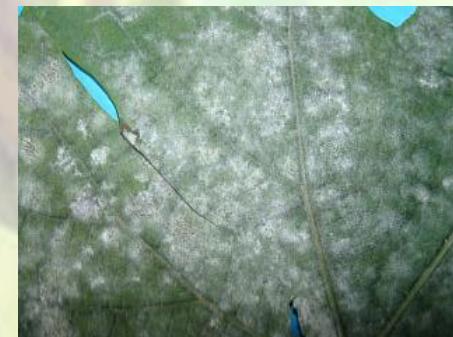
Pests of black chokeberry (*Aronia melanocarpa* [Michx.] Elliot)

- ✓ the qualitative and quantitative structure of Lepidoptera species feeding on black chokeberry bushes were determined
- ✓ the degree of infestation of black chokeberry inflorescences by caterpillars of *Trachycera advenella* on plantations in Poland was determined
- ✓ life cycle and morphology of preimaginal stages of *T. advenella* were described
- ✓ biochemical properties of black chokeberry and "natural" plant hosts of *T. advenella* (*Crataegus monogyna* Jacq. and *Sorbus aucuparia* L.) and their influence on the degree of plant infestation has been examined



Diseases and pathogens of grapevine (*Vitis vinifera* L.)

- for the first time in Poland *Phomopsis viticola* and *Phoma negriana* – dangerous pathogens of grapevine shoots were identified
- It has been proven that these both pathogens are able to colonize asymptotically the grapevine canes, which can result in the spread of pathogens within nursery material



- using conventional and molecular methods a slight morphological and genetical diversity of *Phomopsis viticola* strains from various Polish regions was indicated
- it has proven the usefulness of some strains of bacteria and fungi as well as biotechnical preparations to reduce the growth and development of *P. viticola*

Efficacy of yeasts in control of post-harvest diseases of apples



- ✓ The investigation of influence of some yeasts strains were carried out
- ✓ In *in vitro* tests 13 strains inhibited *Monilinia fructigena* and 8 strains – *Botrytis cinerea*
- ✓ In *in vivo* tests on apples 3 strains: *Candida butyri*, *Candida melibiosica* and *Pichia guillermondii* were the most effective in the control of rots caused by *Botrytis cinerea*, *Monilinia fructigena* and *Penicillium expansum*
- ✓ The research is carried out on action mode of (competition, enzymes)



Research on strawberry pathogens and biological control of its diseases



- ✓ The fungal communities colonizing 12 cultivars in nurseries and fruiting plantations were investigated
- ✓ The effect of fungal communities on *Fusarium oxysporum*, *Verticillium dahliae*, *Cylindrocarpon destructans* and *Colletotrichum acutatum* was studied
- ✓ Results showed that *C. acutatum* is the most dangerous pathogen of strawberry



The investigations on genetic differentiation of *C. acutatum* isolates, with RAPD markers, on the effectiveness of biopreparations in disease control of strawberry and on their effect on fruit aroma and contents of phenolic compounds and vitamin C are in progress

Investigations on anthracnose of black elder



- ✓ Three cultivars grown in Poland were investigated
- ✓ Mycological analysis of fruits and leaves showed that the cause of leaves and fruits necrosis is *Colletotrichum acutatum*

Investigations on methods and means for disease control and on comparison of *Colletotrichum acutatum* populations. From strawberry and black elder (specialization, genetic similarity)

Research offer

- Registration of the occurrence of diseases and pests of fruit crops including their morphology, life cycles and trophic relationships
- Genetic research on the identification and morphological and genetic differentiation of microorganisms pathogenic to fruit plants
- Research on the efficacy of biological agents in diseases and pest control





Research offer

- Searching for the sources of plant resistance to pests and diseases in collaboration with specialists from related disciplines (botanist, physiologist, biochemist, geneticist)
- Evaluation of different techniques and traps used in the monitoring of the most important pests of fruit crops
- Research on the efficacy of epiphytic strains of yeasts and yeast-like fungi in the protection of fruit crops against diseases, including the investigations on the mode of action of these microorganisms



Research offer

- Building of information system (computer data bases) based on biological data which allows farmers of minor crops as blueberries, raspberries and chokeberries to make optimal decision on pest control strategy (in compliance with new UE Directive 2009/128/EC).
- Investigations on the effectiveness of natural substances (oils, plant extracts, essentials oils) in the protection of fruit crops and on their effect on nutritive and taste values of fruits



**Thank you for
your attention**

Contact info:

magda.gantner@up.lublin.pl

agnieszka.jamiolkowska@up.lublin.pl

www.up.lublin.pl