



DEPARTMENT OF PLANT AND ENVIRONMENT PROTECTION

Research, application and perspectives

Prof. d-r Sasa Mitrev, Fidanka Trajkova



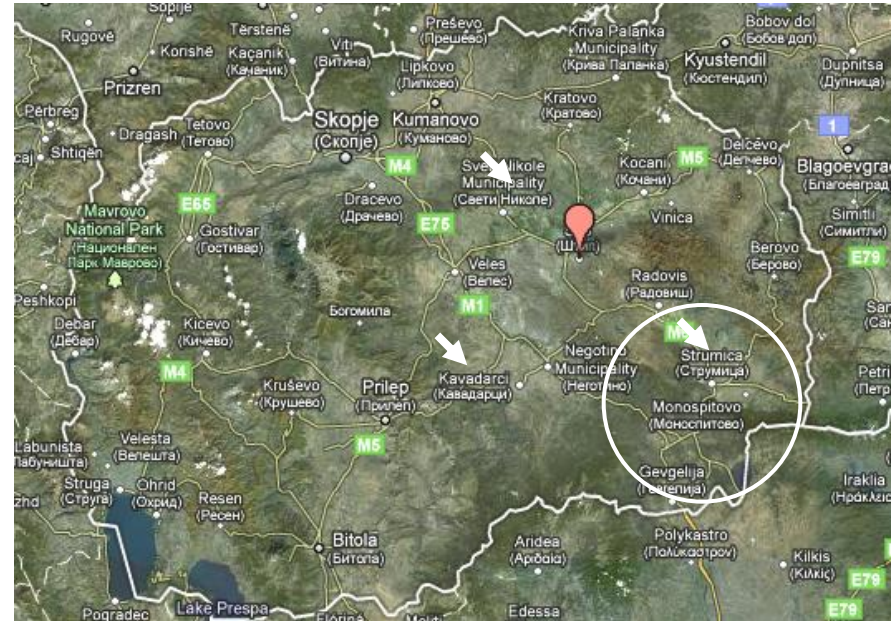
Macedonia - Facts & Figures

Total area (km²) 25.713

Population 2.022.547

Land (km²) 24.856

Water (km²) 477



Agricultural land (ha) 1.260.000

Forests (ha) 948.000

Pastures (ha) 704.000



Priority research

- Field and laboratory identification and determination of plant diseases, pest and weeds
- Own trial fields
- Utilization of modern techniques and methods for identification of bacteria, fungi, viruses and insects
- Performance of specific tests for biological and chemical plant protection
- Use of renewable resources for soil-born pathogens/pests management
- Establishing network of data-recording stations as a precondition for prognosis of disease/pest emergence



International projects

- Global epidemiology of phytoplasma diseases of economic importance in Southeast Europe, SEE-ERA.NET project (2007-2008)
- Control and prevention of grapevine yellows in Macedonia: Diagnosis of phytoplasmas associated to the diseases, Bilateral joint collaboration with CRA-ISC, bilateral project with Italy (2006-2008)
- *Pyricularia grisea* agent for rust fungus at the rice in Republic of Macedonia and China, bilateral project with China (2006-2008)
- Novel biotechnological tools towards food security, NATO Reintegration Grant (2006-2009)
- Peppers diseases in Macedonia – type and breed variety, sources of resistance and material for breeding, bilateral project with Bulgaria (2005-2007)



Domestic projects

- Investigation of cereal crop diseases in Republic of Macedonia and identification of suppression measures (2008)
- Investigation of phytoplasmas as diseases agents of various agricultural crops (2004-2006)
- Reporting – forecast service of Republic of Macedonia for South-eastern Macedonia (2000-2001, 2003-2005)
- Possibilities for application of new methods for acquiring virus-free plant material (2000-2002)
- Investigation of bacterial diseases agents for tomato in Macedonia (2000-2002)
- Investigation of important disease agents and pests in Strumica-Radovis and Valandovo Regions(1996-1997, 2000)
- Investigation of bacterial diseases for pepper in Macedonia (1995-1997)



Running problems

- Lack of control on the amount of pesticide use for disease/pest control
- Underdeveloped Agricultural Knowledge and Information System
- Insufficient human capacity on advisory level
- Insufficient use of IT tools in plant protection on farm level

Department of Plant and Environment Protection



- **Organisation**

- Phytosanitary Laboratory
- Office of Rural Development



Phytosanitary Laboratory

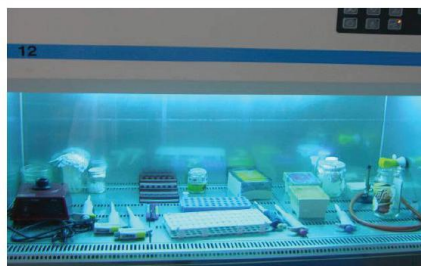
Functional structure

- Department of Plant Protection
 - Unit of Bacteriology and Virology
 - Unit of Mycology
 - Unit of Entomology and Nematology
 - Unit of Herbology
 - Unit of Phytopharmacy
- Department of Applied Chemistry
 - Unit of Soil Analysis and Plant Nutrition
 - Unit of Analytical Chemistry
 - Unit for Determination of Pesticide Residues
- Department of Control of Seed and Propagation Material
- Administration and Technical Support

Phytosanitary Laboratory Equipment



Атомско емисионен спектрометар со индуктивно спрегната плазма, AEC- ISP, Agilent;



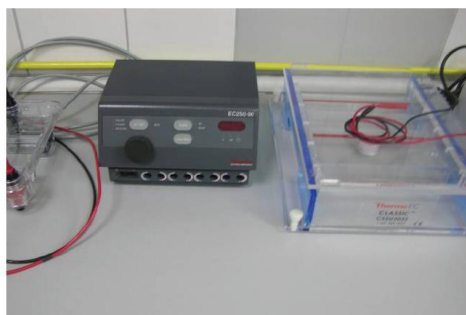
LAMINAR, IS CRA - изолациона комора;



ELISA - комплетен систем составен од хомогенизатор на растително ткиво, промивач и читач за идентификација на вирусните заболувања кај растенијата;



UV TRANSILLUMINATOR; Систем за фотодокументација BDA Biometra Digital;



Хоризонтална електрофореза-BIORAD;
Хоризонтална електрофореза-THERMO;



Вертикална електрофореза-SEE 600 Series;



FastPrep - изолатор на ДНК, РНК и протени;



PCR апарат - EPPENDORF Mastercycler personal;
Градиентен PCR апарат;

Office of Rural Development



- Develop and disseminate timely, research-based information
- Address current and emerging needs of a diverse rural clientele
- Work cooperatively with agencies, organizations, and groups on local, state, national, and international levels
- Developing and dissemination of data base and IT tools utilized in agriculture:
 - Pesticide Data Base
 - Weather Data System
 - ALR calculator for calculation of field crops fertilizers utilization

WatchDog – network of weather measuring stations



WatchDog – network of weather measuring stations



- **Technical characteristics:**
 - Built in data logger
 - LCD display
 - 12-months battery power source
 - Wireless connection to the university intranet system
 - Solar power supply
 - Measured parameters: air temperature, precipitation level, relative humidity, soil temperature at 15 cm depth, wind speed and direction, dew point, leaf wetness
- **Software possibilities/performance:**
 - 5 crops: tomato; potato; apple/pear; cherry; grape
 - Modules for prediction of disease appearance
 - Modules for prediction of pest appearance

Cooperation with other stakeholders



- Contracted parties for services in:
 - Health control of vegetable and cereal crops
 - Control of quality of seed and plant material
 - Design of pest/disease protection models
 - Soil analysis and plant nutrition programmes
- Building-up partnership relationship with advisory service for human capacity building
- Free of charge possibility for use of ORD's data base and tools

Possibilities for joint research programs



- Building-up a network on cross border regions with weather measuring stations
- Exchange of weather parameters and issuing warnings on disease/pest emergence in certain regions
- Building institutional Knowledge and Information System offered for use on different target groups



THANK YOU!