

# AGROTECHNOLOGY NATIONAL LABORATORY

## LABORATORY NETWORKING AND DATA-DRIVEN DECISION MAKING FOR SUSTAINABILITY

The Agrotechnology National Laboratory aims to support the preservation and improvement of soil and its intrinsic environmental condition, while promoting environmental sustainability. Its activities cover the integration of domestic soil testing results into a unified database, the creation of opportunities for the application of environmentally friendly laboratory soil testing methods, the investigation of various biomass materials and their utilisation, and the innovative development of modern crop protection technologies.



### MAIN RESEARCH AREAS

- A national, high-resolution soil database
- Spectroscopy-based soil parameter estimation method
- Domestic soil spectral library
- Biomass fuels
- Performance and environmental testing and certification of solid fuel combustion equipment
- Environmental analysis, monitoring of environmental pollutants
- Plant protection machinery and plant protection technologies

#### CONSORTIUM LEADER:

National Food Chain Safety Office

#### CONSORTIUM PARTNER:

Hungarian University of Agriculture and Life Sciences

**PROJECT NUMBER:** 2022-2.1.1-NL-2022-00006

**FUNDING PERIOD:** 01.01.2022 - 30.06.2024

**OVERALL BUDGET:** 1.215.200.080 HUF

## BENEFITS TO BE EXPECTED FROM LABORATORY RESEARCH

Developing a micropollutant analytical laboratory for complex, targeted detection of organic micropollutants (pesticides, mycotoxins).

The soil spectral library (based on visible, near-infrared, and mid-infrared spectroscopic measurements), representing the soil diversity of Hungary, will provide a time- and cost-effective, environmentally-friendly way to determine key soil parameters at local, regional and national levels. In the efforts to expand this database, the soil data provided by national laboratories following the protocols defined by GLOSOLAN (Global Soil Laboratory Network) play a key role. By joining this global initiative, integrating the protocols and providing continuous data, the Agrotechnology National Laboratory has the opportunity to become part of an international network of users of modern, sustainable and environmentally friendly soil testing technologies.

## THE PROFESSIONAL TEAM

**Gábor Várszegi**, Position: Head of Sustainable management department in National Food Chain Safety Office Directorate of Plant Protection, Soil Conservation and Agri-Environment. With more than 10 years of project management experience, he has already managed a number of research and EU co-funded projects.

**Zsuzsanna Sztupár**, Position: Soil Conservation Officer in NÉBIH Directorate of Plant Protection and Soil Conservation and Agri-Environmental. Examination, quantitative and qualitative analysis of materials applied to arable land for agricultural purposes and their impact assessment.

**Ágnes Nagy**, Head of the laboratory of Food Chain Safety Centre Non-profit Ltd, Soil Conservation Laboratory, Velence, whose task is, among others, to evaluate the nutrient supply and physical characteristics of soils, and to process the data statistically. She as a laboratory engineer analyses soils by ICP-AES instruments. As an international coordinator, she participates in webinars related to the Horizon Europe programme.

**Ernő Kovács**, Head of Soil Biology laboratory of National Food Chain Safety Office Food Chain Safety Laboratory Directorate. He deals with the microbiological examination of soils, the measurement of their biological activity, and the control of soil conditions by toxicity tests. Participates in the processing of samples of Soil Conservation Information and Monitoring System (SIMS). During monitoring, it examines the changes in soil microbial activity.

**Csaba Pesti, PhD**: Director of the Information Systems Directorate of AKI Institute of Agricultural Economics. He started his work at the Institute in 2007, his main research areas were agricultural economics, cost and income analysis, and microsimulation models. He has been an expert in several international development projects, including Montenegro, Kosovo, and Azerbaijan, and as a principal investigator he actively participates in several projects.

**Vince Láng**, PhD: has more than ten years of research experience, the primary focus of which is soil classification, analysis and quality control of large soil databases, use of machine learning based algorithms in the automatic classification of soils.

**Szabolcs Vágó**, PhD: During his nearly ten years as a leader in the field of statistics, he has experienced all aspects of this field. Since he worked for a smaller organization, he had a general responsibility for statistical activity. As a researcher, he is involved in a number of EU H2020 projects (EUREKA, EURAKNOS). He was responsible for statistical audits (Eurostat, National Audit Office, Central Statistical Office) for which he understood national and international requirements even more deeply.

**Szilárd Keszthelyi**, PhD: is head of the FADN Department of AKI Institute of Agricultural Economics. He is responsible for developing and operating FADN (Farm Accountancy Data Network) and its Hungarian subsystem since 1996. He has represented Hungary in EU Commission working groups related to the FADN since 2004. His field of research is the development and organization of microeconomic data collection related to agricultural policy analyses and forecasts.

**Dr. András Béres**, Head of the MATE University Laboratory Center. Main activities: examination of the environmental effects of animal husbandry technologies, investigation of the treatment and utilization of bio-waste, planning and implementation of national and international R & D & I projects, development of examination methods.

**Dr. Gábor Megyeri**, Head of the Accredited Laboratory Examination for Energetics. Main activities: enzymatic decomposition of lignocellulosic materials, determination of energy content of biomass materials.

**Prof. Erika Michéli**, Head of the Institute of Environmental Science and Head of the Department of Soil Science (MATE). Main activities: development of novel methodologies for the analysis, interpretation and monitoring of the heterogeneity of soils.

**László Kovács**, Head of the Accredited Laboratory Examination for Plant Protection Machines in NARIC MGI. Main activities: laboratory and field testing of agricultural power machines and plant protection machines. Research on the application of precision plant protection technologies, development of plant protection machines.

**Dr. Ádám Csorba**, assistant professor at the Department of Soil Science (MATE). Main activities: development of measurement protocols for laboratory spectral measurement. Development of the Hungarian Soil Spectral Library. Development of models for the spectral-based prediction of key soil properties.

**Éva Karakasné Preil**, quality manager. Main activities: the development and operation of the quality system of the MATE University Laboratory Center and the accredited testing laboratories are operating according to the MSZ EN ISO 17025 standard.

**Renáta Rák**, research engineer. Main activities: testing of plant protection machines, research on the development of poultry manure fermentation technology, ammonia emission from pig production,

**Tibor Vojtela**, research engineer. Main activities: agro-energy research and development, animal husbandry technology research, manure management solutions, field machine testing.

**Prof. András Székács**, Deputy Director of the Institute of Environmental Sciences and Head of the Research Center for Agro-Environmental Sciences at MATE. His fields of expertise are chemical and genetic environmental and food safety of agricultural technologies and the development of innovative analytical methods (immunoanalytics, immunosensors).

**Dr. Mária Mörtl**, senior research fellow, Head of the Research Center for Agro-Environmental Sciences of the MATE Institute of Environmental Sciences. Main activities: instrumental analysis and monitoring of agricultural organic micropollutants (pesticides, mycotoxins) and the development of chromatography methods.

**Dr. Péter Korzenszky**, He has 20 years of professional experience in developing and operating quality management systems (ISO 9001, ISO 17025, IFS, MEBIR). He is currently the Quality Officer of the MATE Technical Institute. His research interests are in the field of agricultural engineering and food machinery.

**Dr. Tamás Szegi**, Associate Professor at the Department of Soil Science, Institute of Environmental Sciences, MATE. His main fields of interest are continuing professional activities (research, education, organisation of events) that underpin national and international soil conservation efforts.

## POSSIBLE PARTNERSHIPS

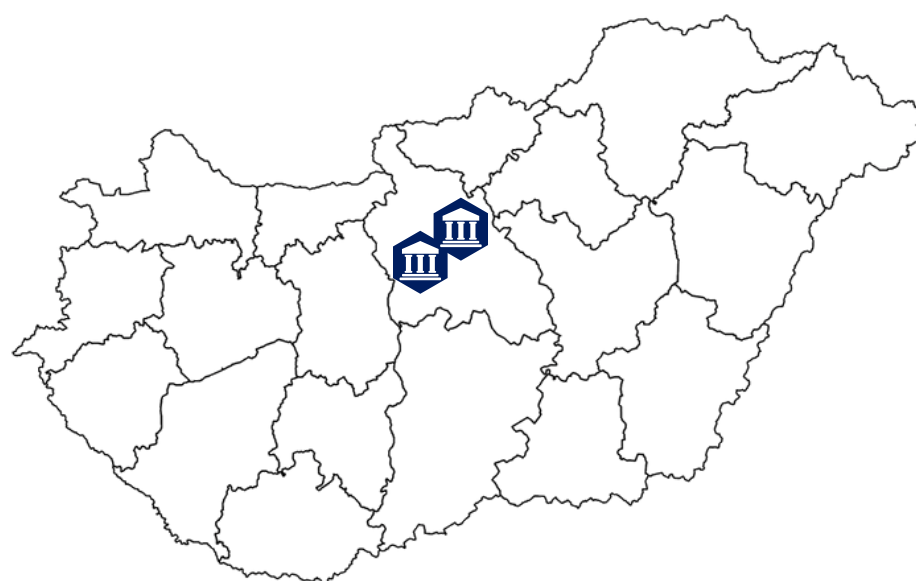
- Cooperation with domestic and international research and innovation partners in the field of soil protection and sustainable soil power management, both in terms of research and monitoring activities.
- Collaborations with machine manufacturers and distributors, especially for the development and qualification testing of boilers, plant protection machines and technologies, drones.
- For analytical analysis of biomass raw materials. To investigate the applicability of raw materials in different technologies and technology lines.

## TARGET GROUP

- Farmers
- Researchers and lecturers
- Professional organizations
- Machinery manufacturers and distributors
- Bioenergy producers and users

## PLACES OF IMPLEMENTATION:

- Budapest
- Gödöllő



### PROFESSIONAL CONTACT

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