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INTERMAT to support efficient crop cultivation

Olomouc (February 13, 2025) - The INTERMAT project, launched by CATRIN researchers in collaboration with commercial partners, aims to enhance the efficiency of crop cultivation in greenhouses and hydroponic systems, improve plant resilience, and boost the competitiveness of companies in the region. Supported by 63.7 million Czech koruna from the Johannes Amos Comenius Operational Programme under the Intersectoral Cooperation for ITI call, researchers will, over the next four years, focus on developing and testing new nanomaterials for plant monitoring and eco-friendly growth regulators.

“In the past, Palacký University’s research centres have achieved numerous results with significant real-world application potential. This is why we have partnered with two innovative companies in the region to collaborate on designing new processes and materials, aiming to translate new technologies into practice. These technologies will enable intensive and efficient crop cultivation in greenhouses and hydroponic systems,” said Ivo Frébort, the project's principal investigator from CATRIN.

In addition to CATRIN, the project includes UP’s Faculty of Science, along with AGRO Haná and Geschur Medical as application partners. Together, they will build on previous research, particularly in materials science and the development of graphene-based materials pioneered by scientists at Palacký University.

The project aims to enhance regional competitiveness, particularly in innovative plant production, biotechnology and biomedicine—key areas of application and innovation at both the regional and national levels. Among the anticipated benefits is a reduction in lighting costs for greenhouse farms while maintaining plant productivity. The project will also leverage one of CATRIN’s inventions—environmentally safe luminescent solar concentrators for harvesting sunlight.

“As part of the project, we will develop innovative materials for cleaning, recycling and monitoring nutrient solutions used in hydroponic plant cultivation. Additionally, we will introduce new materials for monitoring the physiological state of hydroponically grown plants through biosensing, enabling early detection of potential pathogens,” explained Nuria De Diego from CATRIN.

To reduce the use of chemicals in field cultivation, researchers will develop growth regulators designed for the gradual release of active substances. Another research team will focus on technical cannabis, working to increase its resistance to stress conditions with the help of new biostimulants. Additionally, to improve the economic viability of medical cannabis cultivation, experts will propose a method for evaluating bio-waste through the additional extraction of bioactive compounds.

The INTERMAT project (Interdisciplinary Approaches for the Development and Application of New Materials in Industrial, Agricultural and Medical Fields) will run until the end of 2028.

Contact:

Ivo Frébort | hlavní řešitel projektu
CATRIN Univerzity Palackého v Olomouci
ivo.frebort@upol.cz | M: 736 768 134

Martina Šaradinová | PR koordinátor
CATRIN Univerzity Palackého v Olomouci
martina.saradinova@upol.cz | M: 773 616 655

Egon Havrlant | tiskový mluvčí
Univerzita Palackého v Olomouci | oddělení komunikace
E: egon.havrlant@upol.cz | M: 606 607 687
www.upol.cz