LegumeLegacy

NEWSLETTER

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THIS ISSUE

LegumeLegacy Training in Poland

From September 16th to 20th, the MSCA LegumeLegacy Doctoral Network held its latest training event in Poznań, Poland, hosted by the Polish team at the Poznań University of Life Sciences. This training event focused on breeding strategies, applications of Diversity-Interactions models, and root trait analysis, equipping the Doctoral Researchers with essential skills. The Doctoral Researchers also presented their latest findings, receiving valuable feedback from the consortium. Beyond training, participants enjoyed engaging field activities, including transport to various field experiments in a horse carriage and traditional Polish music, creating an inspiring blend of professional and cultural exchange.

Die Hu

DOCTORAL RESEARCHER TRAINING AT THE POLAND EVENT

Training Workshops

The Doctoral Researchers participated in comprehensive training workshops focused on breeding strategies for multifunctional grasslands under abiotic stress, climate change, and disease pressures. These factors significantly impact resilience and agronomic performance, particularly yield stability, in multifunctional grasslands. The breeder's perspective is essential for creating resilient cultivars by selecting key traits and optimizing interspecies competition and complementarity—a central focus of the LegumeLegacy project. Adapting to changing climates and emerging disease threats requires careful selection of species and cultivars suited to local conditions. Additionally, assessing the primary traits driving resilience, response, or adaptation to abiotic and biotic stresses is critical. This need was underscored in a specialised workshop on root traits, where we explored their importance in agroecosystem function, sampling techniques, and measurement challenges. Root traits, especially in mixed-species systems, are pivotal for resilience against adverse conditions and contribute to legacy effects through nutrient cycling in crop rotations. Overall, the trainings deepened the Doctoral Researchers' understanding of breeding resilient, and adaptable grassland systems essential for sustainable agriculture.

The Doctoral Researchers also received comprehensive training on statistical methods for data analysis. This included learning to use Diversity-Interactions models and model selection, as well as understanding mathematical equations to interpret the data effectively. The DRs gained hands-on experience with coding for Diversity-Interactions models using R package *DImodels*, which equips them with essential skills to make data-driven decisions and data analysis.

Die Hu, Julian Nyaga

FIELD EXCURSION DAY AND PROGRESS FROM LAB EXPERIMENT

Field Excursion Day

One of the key highlights of the training event in Poland was the visit to the Brody Experimental Station. The excursion began with a short introductory session at the picturesque Brody Palace covering topics such as the profile of the Brody Experimental Station, details about the GHG emission testing laboratory at the Animal Health and Welfare Center, and the research infrastructure for biogas and biomethane production.

Following the lectures, participants toured the Brody station in horse-drawn carriages, a major attraction of the event. The tour included visits to the GHG emission testing laboratory, biogas production installations, a biomethane production demonstrator, and the multi-year crop rotation experiment. Attendees also explored the dairy cattle feeding system at Brody station, which utilizes half-day grazing and the Natura 2000 area in the buffer zone of Lake Zgierzynieckie for extensive pasture feeding of suckler cows and beef cattle.

A special focus was given to the experimental field managed by one of the Doctoral Researchers, Matej Oreskovic, as this field is crucial for developing a model crop rotation based on the effects of varying ley botanical composition and nitrogen fertilizer levels on follow-on cereal crops. The insightful field tour concluded with a delightful dinner at the Brody Palace, where participants shared their experiences and knowledge gained from the tour.

Prasanth Bendalam

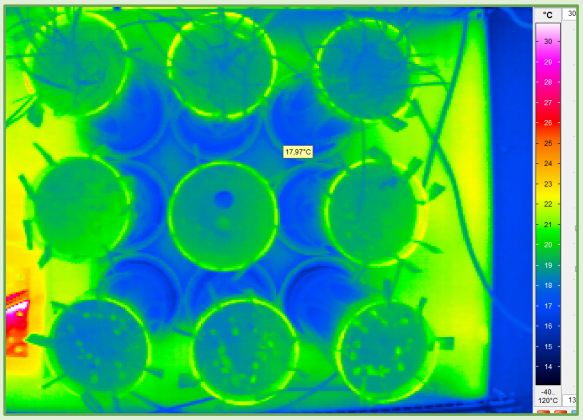
Progress From Lab Experiments

Alongside multisite field experiments, LegumeLegacy is advancing knowledge through controlled lab trials that allow us to simulate conditions, such as climate change, that are challenging to replicate in field settings.

Recently, the University of Hohenheim completed the first climate chamber experiment part of this project. Conducted under highly controlled conditions, this study examined how extreme weather events, such as droughts and heat waves, affect the establishment of the functional groups used in LegumeLegacy mixtures: grasses, legumes and herbs.

Throughout the experiment, among the collected data, thermal images were taken to assess plant stress levels. By calculating the Crop Water Stress Index (CWSI) from these images, we can indirectly gauge plant gas exchange. Under stress conditions, plants close their stomata, which causes leaf temperatures to rise as cooling through water loss diminishes. This response helps plants avoid damaging water tension in the xylem but also impairs photosynthesis due to reduced gas exchange.

Sophia Philadelphi



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LegumeLegacy is an MSCA Doctoral Network

https://legumelegacy.scss.tcd.ie/

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