

Details

Research Center Jülich "Plant Phenotyping" (FZJ-PPt)

The Jülich Plant Phenotyping Centre (JPPC), founded in 2006 at Forschungszentrum Jülich, has been expanded into one of Germany's leading sites for plant phenotyping during the establishment of the German Plant Phenotyping Network, which has been funded by the BMBF with more than 18 million euros since 2012 at the Research Center Jülich. Here, structural and functional properties of plants are measured using non-invasive methods with special consideration of relevant environmental conditions. Plant traits are quantified in automated screening facilities under controlled conditions in climate chambers or in state-of-the-art research greenhouses - now even in high-throughput, as well as in field conditions (including modification of environmental parameters, such as elevated CO₂ concentrations) using a wide range of sensors on the ground or airborne. Non-invasive methods are used to study the performance and characteristics of growth, nutrient and water uptake and efficiency, the influence of abiotic (and to some extent biotic) stress factors in close collaboration with academic partners, breeders and industry. Facilities for quantification of 3D structure of individual plants and canopies using optical methods up to dedicated systems for nuclear spin tomography on plants are established and continuously developed. Experiments are also possible under S1 conditions. All experimental data are stored and processed due to demand.

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[To website](#)

Host Institution

Forschungszentrum Jülich GmbH
Wilhelm-Johnen-Straße
52428 Jülich
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<http://www.fz-juelich.de>

Scientific Domain

Primary Subjects:

- Biology
- Agriculture, Forestry, Horticulture and Veterinary Medicine

Secondary Subjects:

- Chemistry
- Physics
- Mathematics
- Computer Science, Electrical and System Engineering

Category

Agronomy, Forestry and Plant Breeding Centres

Scientific Services

In recent years, Forschungszentrum Jülich has developed into a leading institution in Germany and Europe in the field of plant phenotyping by coordinating the BMBF-funded German Plant Phenotyping Network (DPPN) and the resulting DPPN e.V., as well as by coordinating the EU-funded European Plant Phenotyping Network (EPPN) and co-coordinating the European research infrastructure EMPHASIS. This includes not only the development and application of state-of-the-art methods for plant research, but also their provision to external users within external user projects: within DPPN, EPPN and EMPHASIS, external user groups are given access to facilities for plant phenotyping that are unique worldwide. Funding for access is available through the user's own resources or through other funding agencies. Within EPPN and DPPN, facilities are also available free of charge if funding is available. Publicly funded scientific institutions from Germany can submit applications through DPPN e.V., which are evaluated by independent reviewers. Projects selected for funding will be supported in their experimental work at the

phenotyping facilities. This support includes supervision in the preparation and execution of the experiments, instruction in the use of the infrastructure, in data analysis and interpretation.

Scientific Equipment

- GrowSCREEN Rhizo 1 and 3
- GrowSCREEN PaGe, GrowSCREEN Agar 2
- SCREEN-House, SCREEN Chamber
- 3-D Imaging Box
- STUPS (Sensor-to-Plant Imaging System)
- fixed and portable MRI Systems (1,5 & 4,7 T)
- pheno-PET
- phenoSeeder
- Mini-Plots
- HiDeR, Hyper Lab; LIFT
- BreedFACE
- FieldCOP, FieldLIFT
- FLOX-Box, HyScreen
- FieldSHIP, FieldGLIDER, FieldCOPTER
- HyPlant

Keywords

- phenotyping
- genotype
- phenotype
- root
- shoot
- structural traits
- functional traits
- non-invasive methods
- image analysis
- Datamanagement & -processing
- crops
- resource use efficiency
- plant breeding
- field
- sensors

Networks

German Plant Phenotyping Network (DPPN) e.V.
<http://www.dppn.de>

European Plant Phenotyping Network (EPPN)
<http://www.plant-phenotyping-network.eu>

European Infrastructure for Multi-scale Plant Phenomics and Simulation EMPHASIS
<http://www.emphasis.plant-phenotyping.eu/>

Users per annum

Internal Users: 50
External Users in total: 35
External Users: 15
External Users in the EU: 15
External Users outside of EU: 5