EUROPEAN UNION

RI AT CZ

Interreg
Austria-Czech Republic
European Regional Development Fund

EUROPEAN UNION

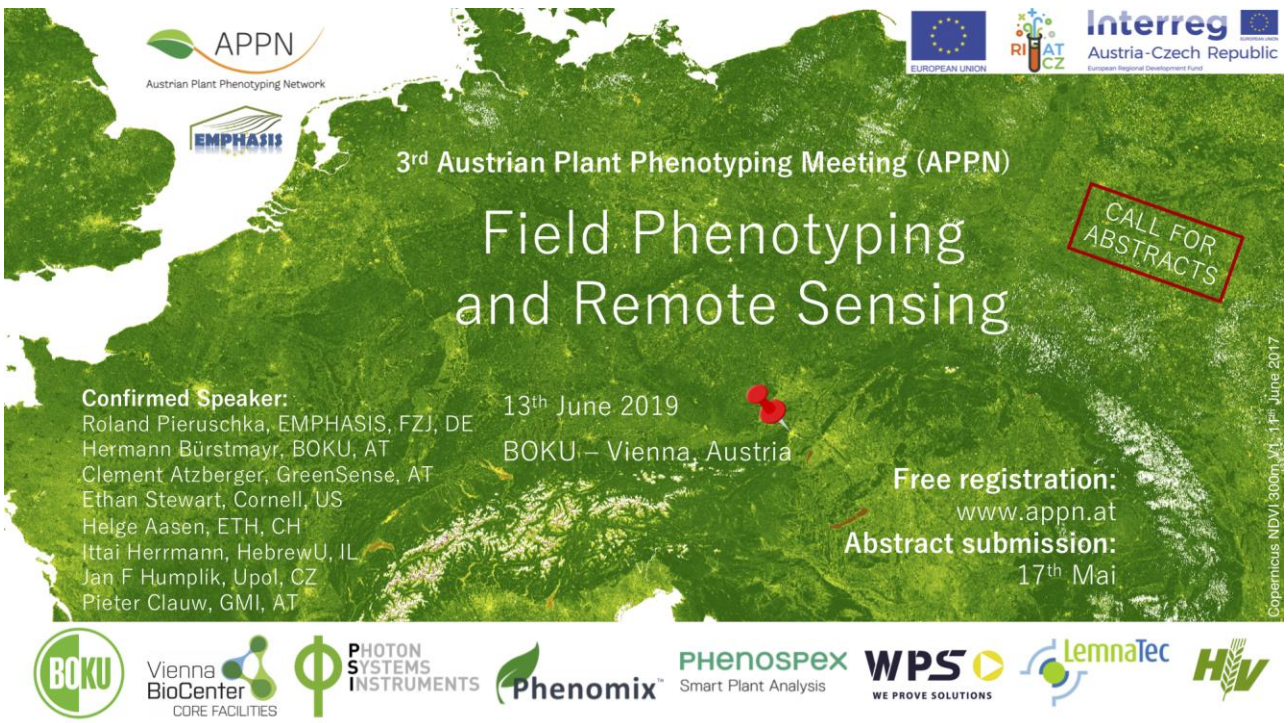
APPN
Austrian Plant Phenotyping Network

Enhancing the Austrian Plant Phenotyping community . . .

3rd APPN Meeting
13th June 2019

Jakub Jez

1



2

Est. 2017

Vienna BioCenter CORE FACILITIES · universität wien · universität innsbruck · BOKU Universität für Bodenkultur Wien

APPN Austrian Plant Phenotyping Network

Jakub Jez, Head, Plant Sciences Facility, Vienna BioCenter Core Facilities GmbH (VBCF)
Substitute: Anna Smolka, Phenotyping Specialist, Plant Sciences Facility, VBCF
Stefanie Wienkoop, Ass. Prof., Faculty of Life Sciences, University of Vienna
Substitute: Dr., Markus Teige, Faculty of Life Sciences, University of Vienna
Ilse Kranner, Univ.-Prof., Institute of Botany, University of Innsbruck
Substitute: Thomas Roach, Ass. Prof., Institute of Botany, University of Innsbruck
Gernot Bodner, Priv.-Doz., Division of Agronomy, University of Natural Resources and Life Sciences
Substitute: Boris Rewald, Ass. Prof., Institute of Forest Ecology, University of Natural Resources and Life Sciences

APPN office
Jakub Jez
VBCF GmbH, PlantS
Dr. Bohr Gasse 3
1030 Vienna
Jakub.jez@vbcf.ac.at
Tel: +43 1 7962324 – 7090

partner: GMI Gregor Mendel Institute of Molecular Plant Biology · AGES Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH · AIT Austrian Institute of Technology · UNI GRAZ · IAEA International Atomic Energy Agency · TU WIEN Technische Universität Wien Vienna University of Technology

www.appn.at

Twitter: @VBCF_PlantS

ResearchGate, LinkedIn

Mailing List

Austrian Plant Phenotyping Network (APPN)

3

To coordinate and unite the Austrian Plant Phenotyping community

To develop methods and national plant phenotyping infrastructure

To facilitate joined research collaborations

EMPHASIS

To support the ESFRI EMPHASIS project

Teaching

APPN Austrian Plant Phenotyping Network

To facilitate staff training and staff exchange

Organization of yearly meetings and workshops

GOALS

www.appn.at

4

VBCF Plant Sciences Facility, Vienna
Environmental simulation & HT phenotyping
23 state-of-the-art phytotrons:
- 4 cold stress phytotrons (-15C)
- 4 phytotrons adj. light spectrum (LED)
- 2 CO2 phytotrons
- 1 plant pathogen phytotron
- 1 HT *phenotyping* phytotron
- 3 PHENOBox & PHENOScan
- **PHENOPlant coming 2021**

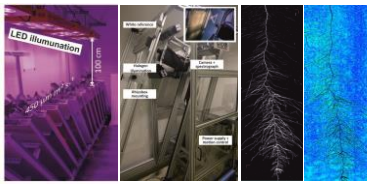
Jakub Jez

Manual Root Phenotyping, BOKU, Vienna

- Greenhouse & Phytotron
- Seedlings to mature crop plants
- Root morphology, symbiont-root interactions, physiological parameters
- Machine learning trait analysis approaches

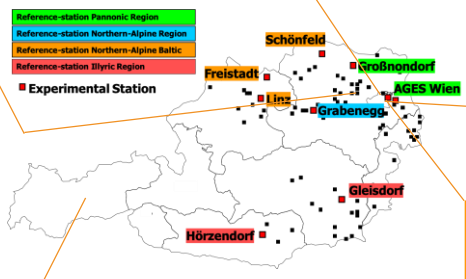
Boris Rewald

Hyperspectral Root Phenotyping, BOKU, Tulln



- Spectral based root segementation
- Water mapping
- Exploration of other spectral features in roots (e.g. root age) and soil
- Combination with aboveground measurements

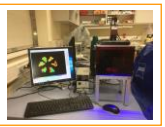
Gernot Bodner



Subcellular and physiological phenotyping, Univ. Vienna
- Organelle stoichiometric analyses
- Soil-Plant-Atmosphere-Continuum (SPAC) & Soil Root Interface (SRI)

Stefanie Wienkoop

Chlorophyll Fluorescence Imaging, Univ. Innsbruck
- Walz Imaging PAM
- Whole plant level
- Subcellular level

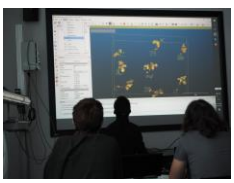


Thomas Roach

PHENOTYPING LANDSCAPE AT

www.appn.at

5



APPN
Austrian Plant Phenotyping Network

Est. APPN
1st APPN Meeting @VBC
March 2017

Multispectral 3D Imaging Workshop @VBC
October 2017

Modern Plant Microscopy Workshop @VBC
February 2018

2nd APPN Meeting
EPPN2020 Root Phenotyping Workshop @BOKU
April 2018

Plant Phenotyping Forum @VBC
September 2018

3rd APPN Meeting
Field Phenotyping & Remote Sensing @BOKU
June 2019

Signing the APPN MoU
4th APPN Meeting @Univ. Vienna
2020

Start of operation PHENOPlant Platform
5th APPN Meeting @Univ. Innsbruck
2021

NATIONAL ESFRI ROADMAP

www.appn.at

6

FFG
Forschung wirkt.

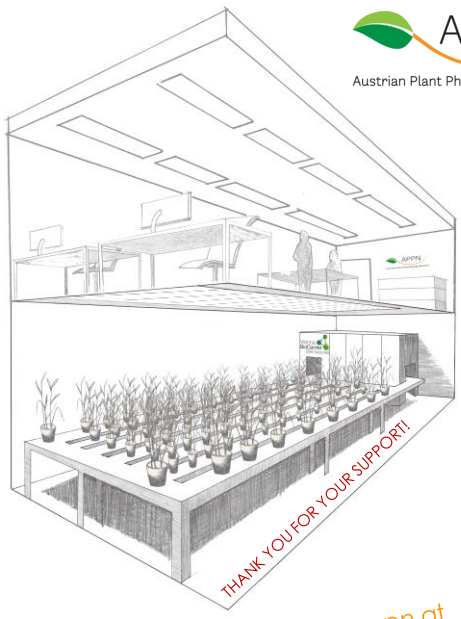
APPN
Austrian Plant Phenotyping Network

FFG F&E Infrastruktur call 2018:

Multi-sensor and multi-approach high-throughput plant phenotyping platform - PHENOPlant

Project term: March 2019 – July 2021
Location: Vienna BioCenter - VBC
Operation: VBCF PlantS (non-profit for academics!)
Access: ALL academic institutions and companies
Volume: ~2.0M EUR (1.5M EUR FFG + ~0.5M VBCF in-kind)

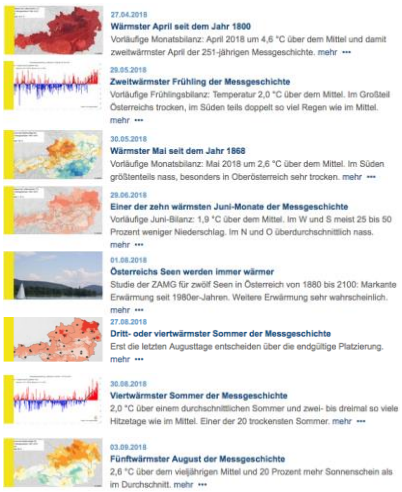
- ✓ Highly controlled environment (phytotron)
- ✓ Conveyor-belt transportation system
- ✓ Automated weighting and watering
- ✓ Arabidopsis & crop plants up to ~70cm
- ✓ Full range of state-of-the art sensors:
  Chlorophyll fluorescence, 3D RGB, thermal imaging, hyperspectral imaging,…



PHENOPlant Platform

www.appn.at

7



ZAMG
Zentralanstalt für Meteorologie und Geodynamik

2018 AT (status September 2019):

APPN
Austrian Plant Phenotyping Network

2nd hottest spring and 4th hottest summer (since 251 years)
(the other 3 are: 2017, 2015 and 2003)

Vienna: 36/42 (city) days above 30C (vs. 21/15 days 1981-2010); St. Pölten: 31 vs. 13
Vienna: 32 (city) tropical nights (>20C)

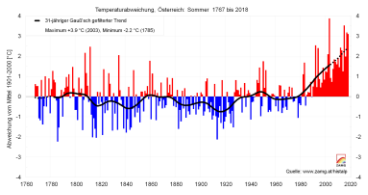
Up to max -85% rainfall (April) (-25% mean); 20th driest summer since 251 years

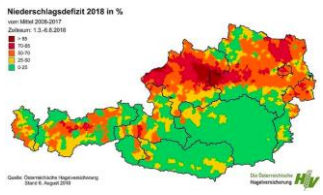
4 severe drought damage events in the last 6 years

210 Mio EUR agricultural damage by heat/drought stress

60 Mio EUR financial direct support of the agricultural sector

Prediction 2019 and beyond: bad





REPORT AT 2018

8

THANK YOU FOR YOUR ATTENTION!

Jakub Jez
Head, Plant Sciences Facility
Vienna Biocenter Core Facilities GmbH

Dr. Bohr Gasse 3
1030 Vienna
jakub.jez@vbcf.ac.at
www.viennabiocenter.org
www.appn.at
@VBCF_PlantS

www.appn.at

9