PRO-GRACE
PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

EMPHASIS

Funded by the European Union

EMPHASIS: The road towards a plant phenotyping community

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Forschungszentrum Jülich

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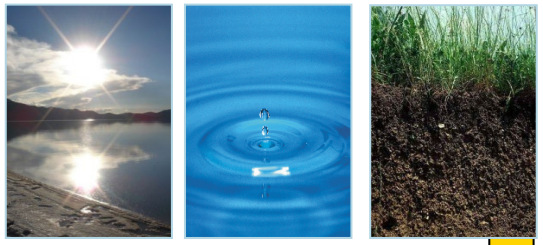
Global Challenges require sustainable agriculture

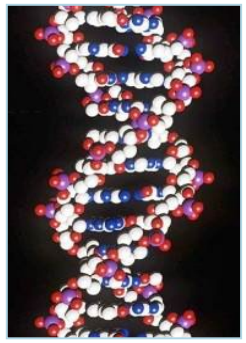
Sustainable agriculture

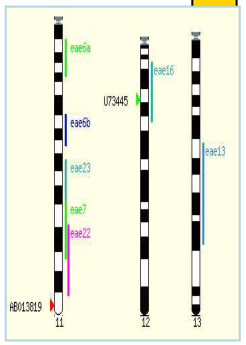
Plant Phenotyping key element of a sustainable agriculture



Environment

Genes





Plant performance and plant production

- Higher quantity and quality of plant biomass production
- Novel characteristics and products
- Yielding in stressful environments
- Sustainable production / intensification

nature x nurture → phenotype

Growing demand for quantitative plant phenotyping as a tool

- Addressing diverse crops and conditions
- Specialized infrastructure
  - plant characterization:
    - phenotyping
  - environmental simulation & monitoring
    - envirotyping
- Integrated (multi-disciplinary) approaches require dedicated technology and expertise
- Europe has been the global leader, but competition is growing

Plant phenotyping initiatives to address the demand

Deutsches Pflanzen Phänotypisierungs-Netzwerk DPPN

APPN Austrian Plant Phenotyping Network

PHENOME EMPHASIS French Plant Phenomic Infrastructure

PPN-Ireland

Phen-Italy

NPEC

PhenomUK

Belgian Plant Phenotyping Network

CZPPN CZECH PLANT PHENOTYPING NETWORK

EUROPEAN NATIONAL INFRASTRUCTURE

MICROBES 4CLIMATE

PHENET PHENOTYPING & ENVIROTYPING SOLUTIONS FOR AGROECOLOGY

European Plant Phenotyping Network EPPN

European Plant Phenotyping Network EPPN 2020

cost

AgroServ Integrated SERvices supporting a sustainable AGROecological transition

STARGATE Sensors and daTA tRainiG towards high-performance Agri-food sysTEms

DROPS

EURoot

EUROPEAN REGIONAL PROJECTS / NETWORKS

EMPHASIS

ESFRI

Long-term and stable organization

- integrating and operating a pan-European infrastructure
- listed on ESFRI roadmap since 2016

Objectives

DEVELOPING INFRASTRUCTURE AND PROVIDING ACCESS

The road to Operation:

legal, financial, operational framework

Preparatory Phase (2016-2020)

- H2020 (€4m)
- Work undertaken as per the EC proposal
- Evaluate the phenotyping landscape develop a business plan

Implementation Phase (2021-2025)

- HE (€1.5m)
- Governed via interim agreement
- Official representation of ministries (11 countries)
- Set up of EMPHASIS pan-European Services
- Widen membership
- Set up of National Nodes

Operational Phase (2026 onwards)

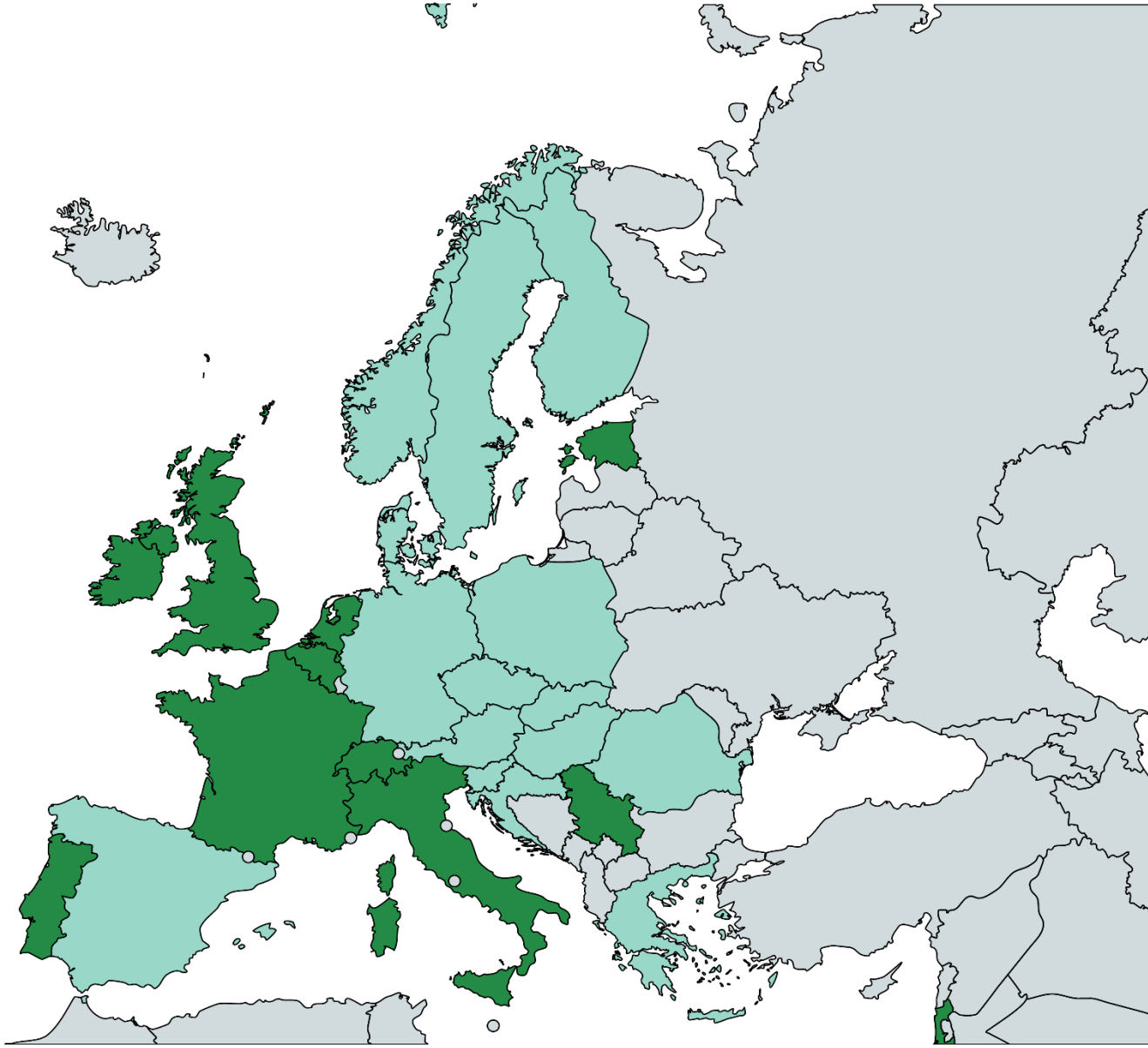
- Long-term legal framework (ERIC) in place
- Fully function governance bodies
- Annual membership contributions
- Full access for members to facilities and services

ESFRI

The road to Operation:

Plant phenotyping community in Europe

- 4 countries ESFRI Roadmap application
- 7 countries Prep. Phase
- 11 countries EMPHASIS Impl. Phase
- 15 countries with scientific communties (EMPHASIS Support Group)
- Support the development of
  - national communities
  - national roadmapping



The road to Operation:

Developing services

2012-2015: EU FP7 Transnational Access 14 partners (5 ME)

2017-2021: EU H2020 Transnational Access 22 partners (10 ME)

National infrastructures as a backbone for EMPHASIS and Infrastructure projects

2012 – ongoing:
Development of multiple national RIs providing services

NaPPI

PhenomUK

Belgian Plant Phenotyping Network

PPN-Ireland

https://eppn2020.plant-phenotyping.eu/

EPPN/EPPN2020 – access & community integration

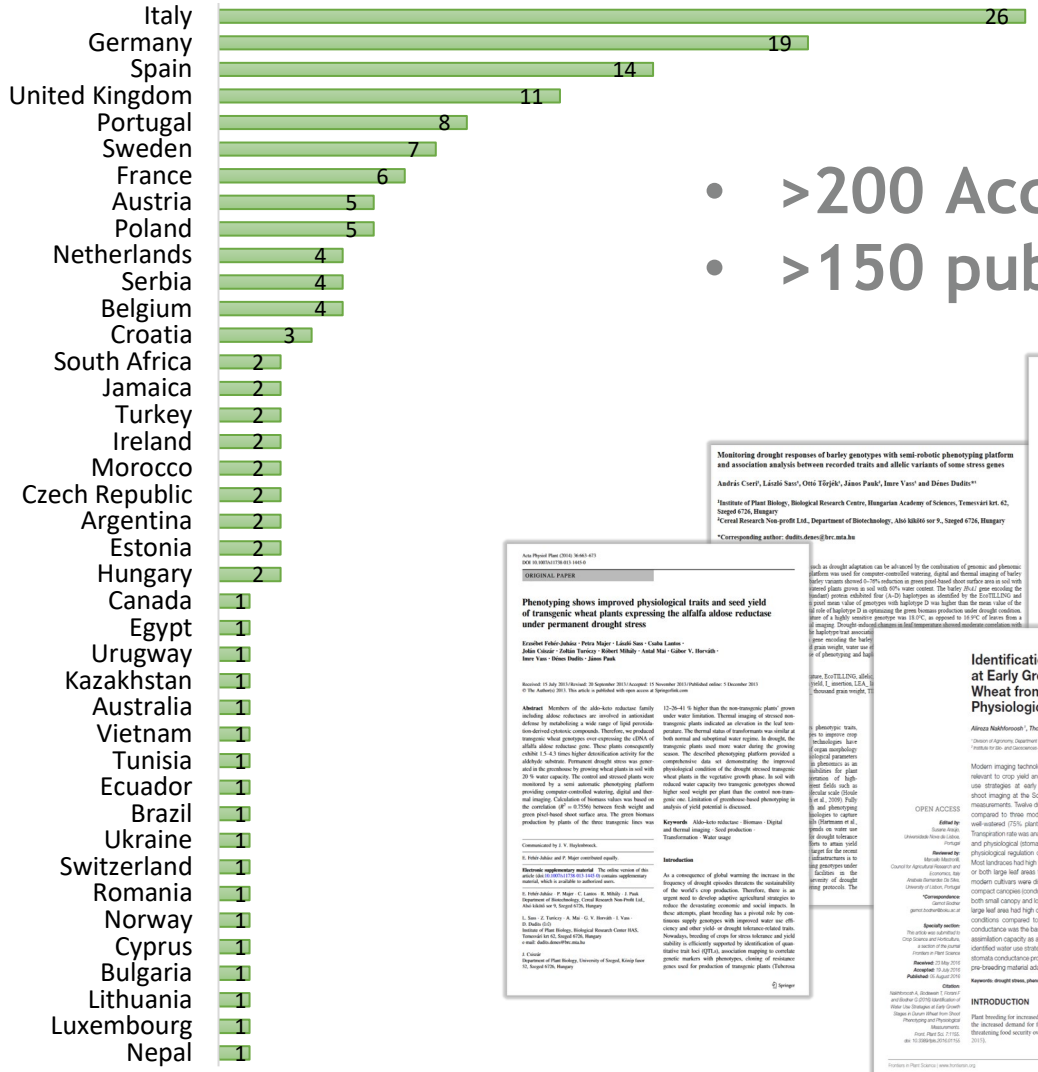
European Plant Phenotyping Network
EPPN

European Plant Phenotyping Network
EPPN 2020

Starting community

Advanced community

EPPN2020 Transnational Access projects



- >200 Access experiment
- >150 publications

The road to Operation:

widening the scope of plant phenotyping

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2017-2021: EU H2020 Transnational Access 22 partners (10 ME)

2019-2023: Digital life sciences ~70 partners (26 ME)

2022-2027: EU HE Agroecology (15 ME) Transnational Access ~70 partners

2022-2025: EU HE AI4Life, AI (5ME) image analysis ~10 partners

2023-2027: EU HE Agroecology (10 ME) novel tools, methods ~20 partners

2024-2028: EU HE Transnational Access, ~30 partners (15 ME)

National infrastructures as a backbone for EMPHASIS and Infrastructure projects

2012 – ongoing:
Development of multiple national RIs providing services

NaPPI, PhenomUK, Belgian Plant Phenotyping Network, Phen-Italy, PPN-Ireland, NPEC

Infrastructure projects

Providing services

AgroServ: sustainable and resilient agriculture and agroecological transition

AgroServ
Integrated SERvices supporting a sustainable AGROecological transition

- 1st call – closed
- 2nd call – opens 27th of June

https://agroserv.eu/

Microbial services addressing climate change risks for biodiversity and agriculte

MICROBES 4CLIMATE

- 1st call – opens at the end of 2024

https://microbes4climate.eu/

Developing services

Tools and methods for extended plant PHENotyping and EnviroTyping services

PHENET
TECHNOLOGIES FOR AGROECOLOGY

- Deliver new services for RIs

EMPHASIS eLTEP AnaEE elixir

https://phenet.eu/

The road to Operation:

integration

since 2016: EMPHASIS-PREP / EMPHASIS-GO
ESFRI infrastructure, currently 11 countries will establish an ERIC
In total 25 national communities active in plant phenotyping

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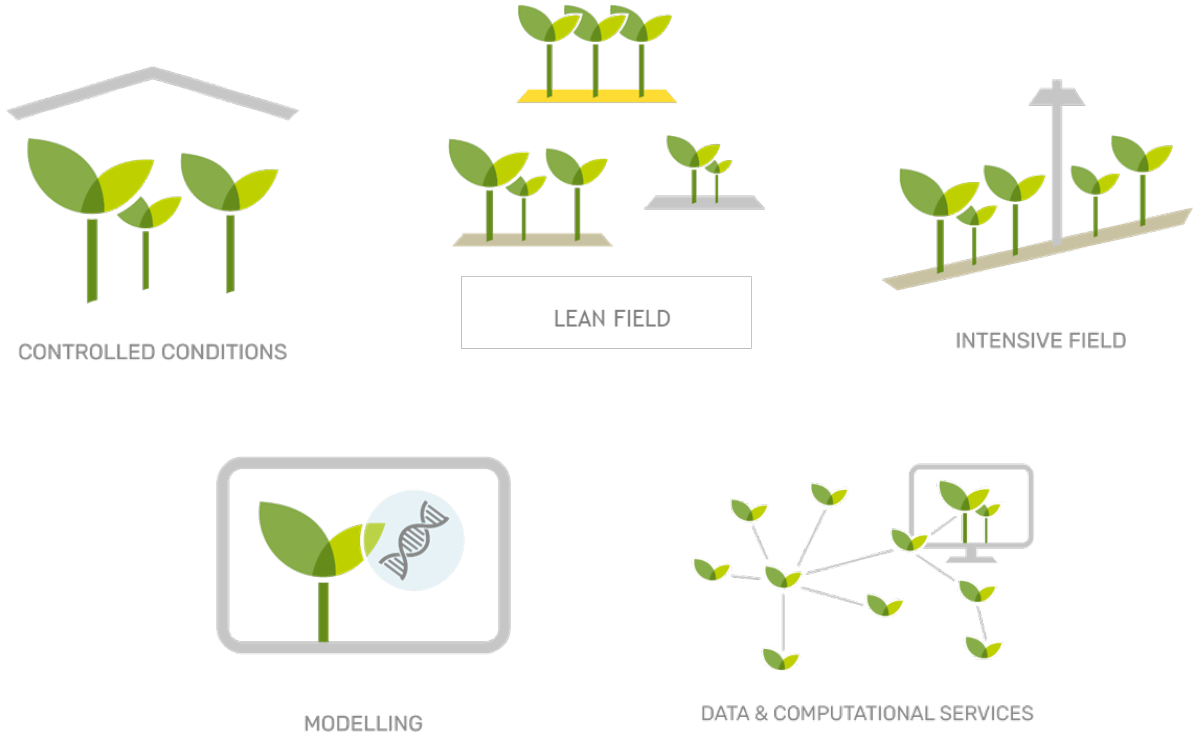
The road to Operation:

plant phenotyping requires integrated concepts to fully explore its potential



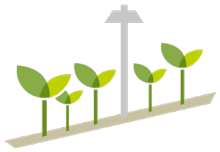
Source: EMPHASIS homepage (https://emphasis.plant-phenotyping.eu/emphasis_infrastructure_map)

The road to Operation:

sustainable services provision

CONTROLLED CONDITIONS

LEAN FIELD



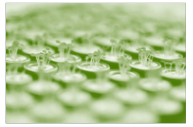
INTENSIVE FIELD

MODELLING

DATA & COMPUTATIONAL SERVICES

EMPHSIS service portfolio

User Access: facilitate user access to installations and facilitate under controlled and field conditions



Advancing phenotyping practices: develop and implement methods, tools for phenotyping workflow

Industry engagement: facilitate knowledge and technology transfer

Data management and modelling: establish FAIR data principles and a European information system

Communication: engage all relevant stakeholders in a research infrastructure environment

Training and education: develop and implement training activities

EMPHASIS

EMPHASIS is an ESFRI-listed project supported by the European Union.

EUROPEAN INFRASTRUCTURE FOR PLANT PHENOTYPING

EMPHASIS

Get In Touch

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Emphasis on Plant Phenomics