PRO-GRACE

PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

CIHEAM - International Centre for Advanced Mediterranean Agronomic Studies

Mediterranean Agronomic Institute of Chania

TRAINING OPPORTUNITIES FOR THE GRACE RESEARCH INFRASTRUCTURE

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The stakeholders of the proposed RI:

- Plant Scientists
- Seed banks
- Research institutions working on PGRs
- Other large research infrastructures
- Seed companies
- Plant breeders
- Farmers
- National and international agencies dealing with plant biodiversity
- Seed conservation networks
- All those involved in the 600 PGR collections in Europe

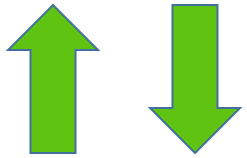
Stakeholders for GRACE-RI training:

- Seed banks personnel **Quality management practices improvements in gene banks ?**
- Early career scientists: (PhD, MSc students) working on PGRs **Phenotyping, genotyping, -omics?**
- Principal Investigators (PIs) working on PGRs **PGR Databases use, -omics, bioinformatics?**
- *In situ* PGR structures stakeholders **Best practices applications?**

Training courses should be tailored made to the needs of each specific group

A survey might be able to prioritize training needs for PGRs stakeholders

Promoters of the RI: genebanks, large research institutes working on PGR, in situ conservation structures



Utilizers of the RI: small seed banks, individual plant scientists, seed companies, plant breeders, nurseries, farmers

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Establishment of GRACE-RI TRAINING PLATFORM

to strengthen training capacity within the PGR stakeholders

Goals:

- to create a Training Community
- serve as a scaffold for developing training activities and training infrastructures
- Develop and promote the best practices within PGR community

Organization of Training courses in collaboration with the other ESFRIs

What is the content of the TRAINING PLATFORM ?

- Training & Research
- Training activities and Training material Development
- Training Infrastructures

• Training & Research

- **Training through short term projects for conducting research in the GRACE Research Infrastructure network**

1, Every certain period of time a call for proposals will be announced for PIs of PGR community as well as other interested stakeholders

- The proposals will be evaluated by an Evaluation committee established by GRACE RI
- The project will cover the cost for the Host Institution RI and the PI group member to conduct the research
- A specific structure for the proposal application form will be created

2, Every certain period of time a call for proposals for very short term research missions will be announced for PIs interested to develop a collaboration for research project development.

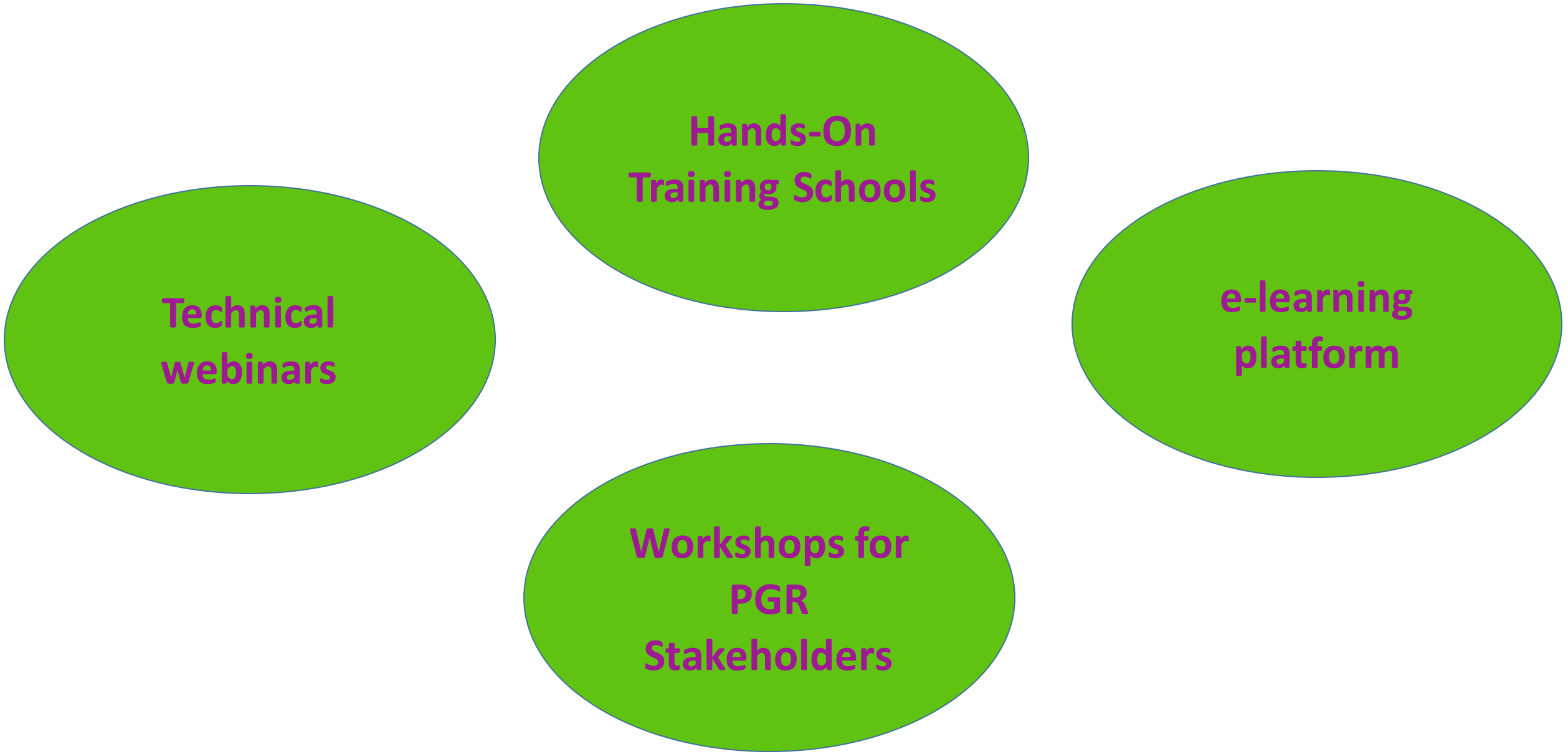
- The proposals will be evaluated by an Evaluation committee established by GRACE RI
- A specific structure for the proposal application form will be created

Training activities and Training material Development

- Identify Training gaps and urgent needs for PGRs managements

- Develop useful and FAIR training material for PGRs

Structure of Training activities and creation of Training material



Hands-On Training Schools

-omics technologies for the management of plant genetic resources.

PGRs and Metabolomics courses
Genotyping of PGRs & genomics tools courses

GRACE – RI tools

Sample preparation
Sample transport
Bioinformatics analysis
of metabolomics data

ELIXIR involvement
Scientific domains (Genes and Genomes)
Type of Service (software tools)
DISSCO involvement for omics data

TRAINING COURSE JOINTLY ORGANIZED By ELIXIR, EMPHASIS and GRACE RIs

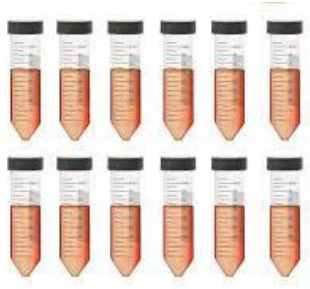
EMPHASIS involvement

Phenotypic data To select tissue

Nurseries, Seed Banks, In situ structures

GRACE-RI

Sample preparation



Metabolomics Transcriptomics

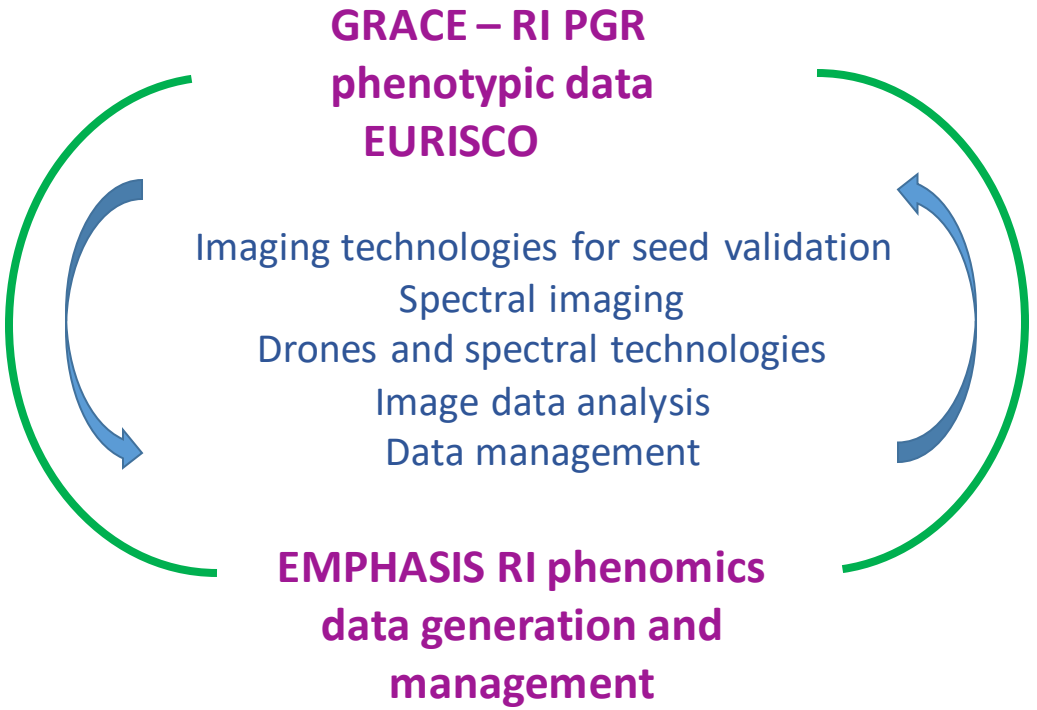
ELIXIR involvement

Advanced Bioinformatics analysis

Hands-On Training Schools

Evaluation and Valorization of PGRs

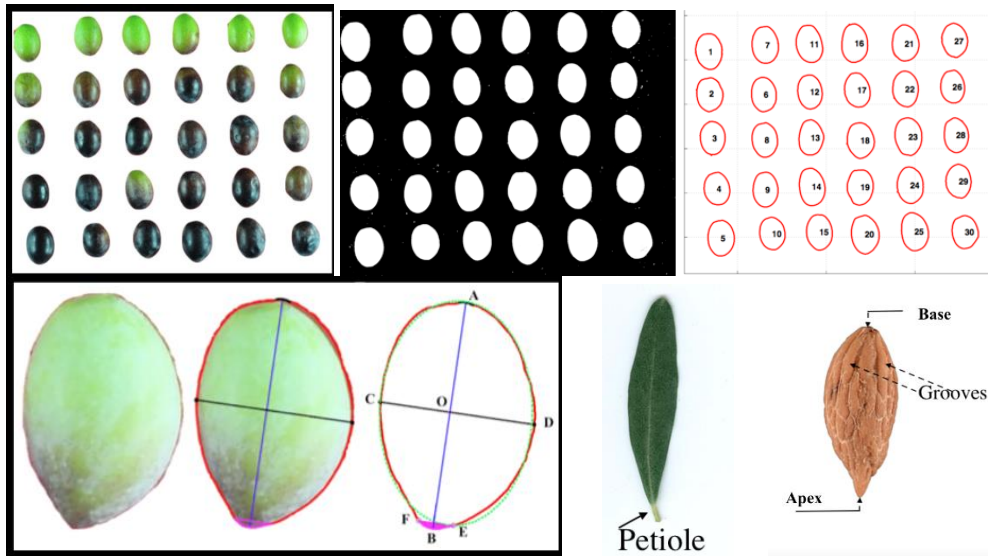
Phenotypic data exploitation courses



TRAINING COURSE JOINTLY ORGANIZED
By EMPHASIS, ELIXIR and GRACE RIs

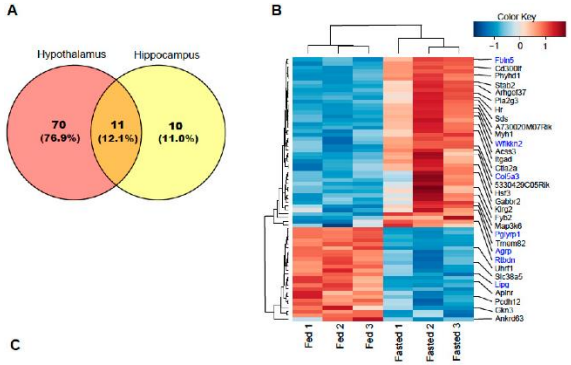
EMPHASIS involvement

Olive stone image analysis and cultivar classification



GRACE-RI

Olive cultivar genotyping
For validation



ELIXIR involvement

Machine learning
Cultivar identification

Technical webinars

Plant Genetic Resources Information System

Bioinformatic tools for accessing/providing PGR-linked information courses

Workshops for PGR Stakeholders

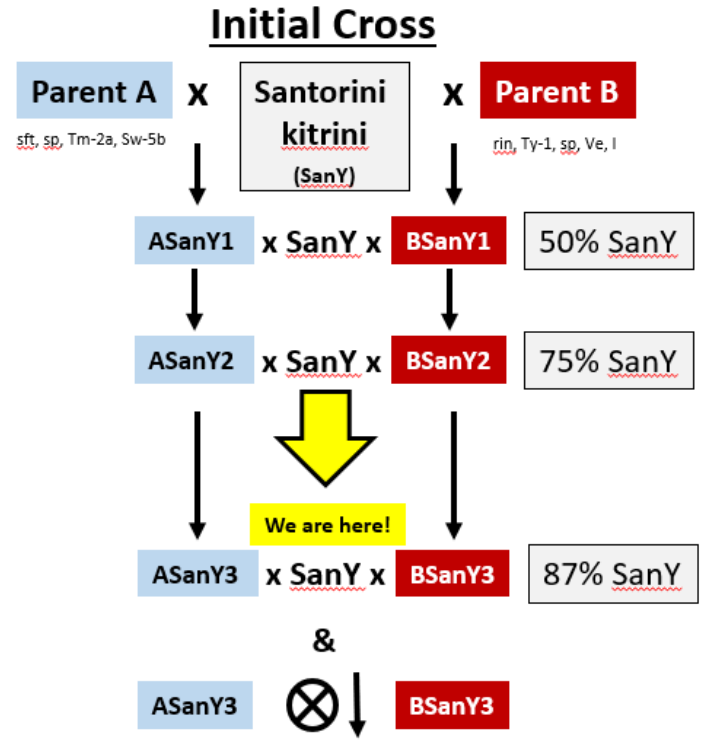
Protocols and guidelines for PGR ex situ and in situ management courses

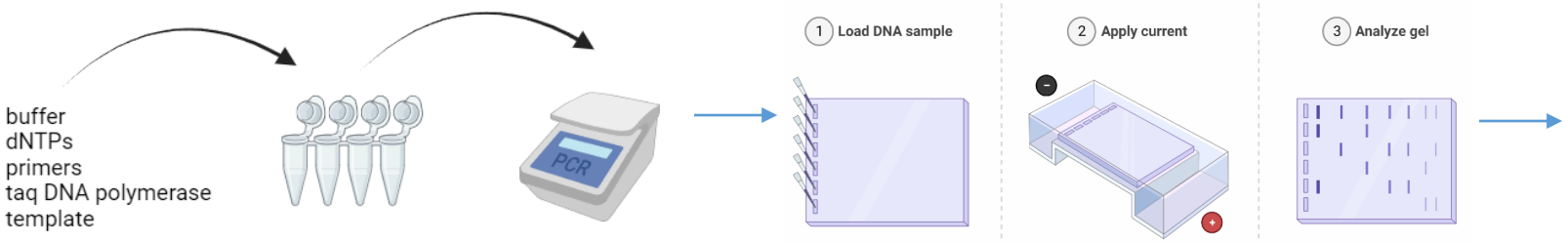
PGR Infrastructures for Trainees

Genotype for breeding

- Marker assisted selection in identifying plants with the desired characteristic

The **rin** ripening mutation in tomatoes is induced by the deletion of a genomic DNA fragment on chromosome 5





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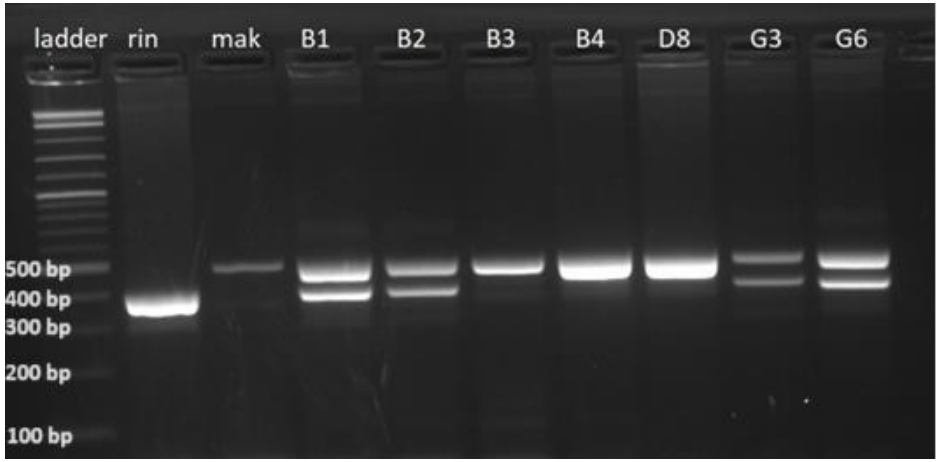
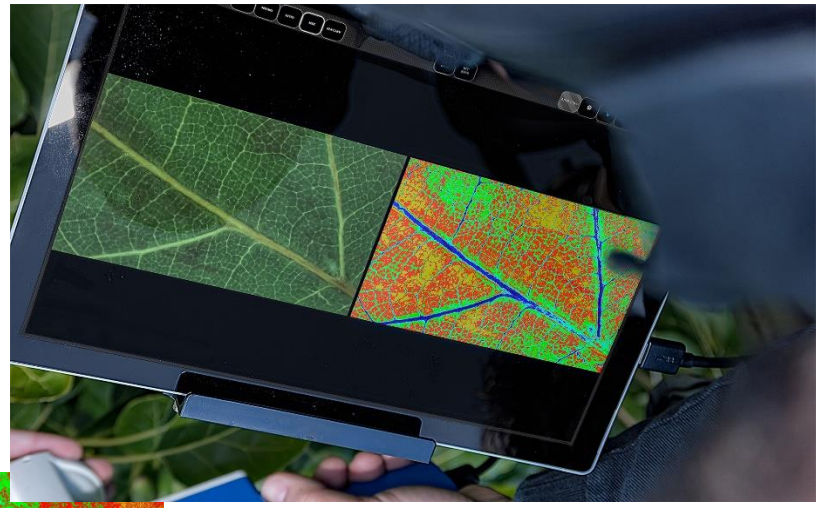


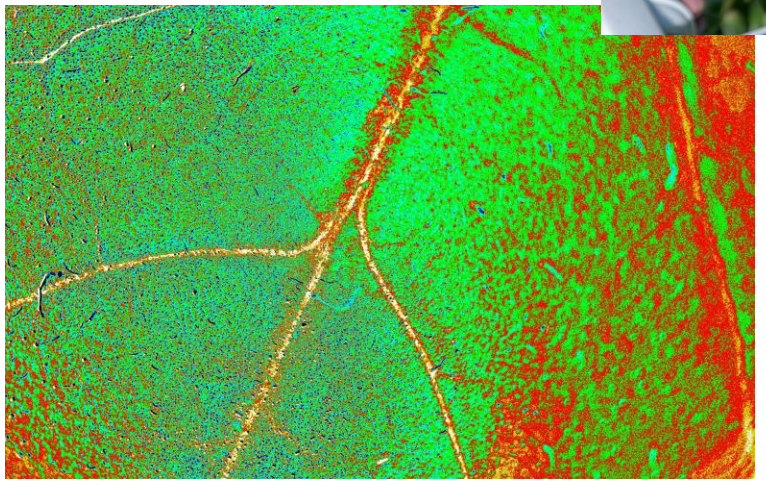
PGR Infrastructures for Trainees

A hands-on training workshop with a battery-operated, wearable, macro-imaging system for in-situ monitoring

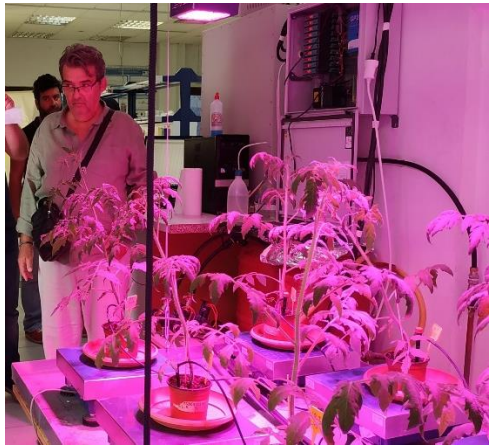


Abiotic and biotic Stress Monitoring

Spectral imaging system



Leaf spectral image



The main subjects of Training Courses:

- Protocols and guidelines for PGR ex situ and in situ management,
- Multiplication of heterogeneous/clonal accessions,
- Basic phytosanitary techniques (safe seed transfer among partners -> protocols)
-
- Bioinformatic tools for accessing/providing PGR-linked information
- -omics technologies in the management of plant genetic resources.

PGR training gap: Multiplication of heterogeneous/clonal accessions

Provide the theoretical background,
Propagation techniques
Clonal characterization

Practical training in GRACE-RI infrastructures
Use of Genotyping, phenotyping tools to detect heterogeneous clones
Clonal propagation protocols
Possibilities for in vitro approaches

PGR training gap: Basic phytosanitary techniques (safe seed transfer among partners)

Development of best practices and protocols
Issue of valid certification by GRACE-RI

How to train people to produce a PHYTOSANITARY CERTIFICATE in order to circulate your PGRs (seeds, tissues)

TRAINING FOR THE GENERAL PUBLIC

Priority for students education

TOOLKITs for students awareness and training

in addition to visits to PGR units training sessions are important

Train the Trainers for educational purposes

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WORKSHOP IDENTIFICATION CARD

Title of Workshop

Overview:

Description of the topic, workshop aims, learning outcomes, why and how the topic is related to GRACE-RI, what is expected of the trainees.

Detailed program of the workshop

Trainers

Title - Date - Start time - End time

Overview

Aims

Who is the course for?

Learning outcomes

Trainer

Certification

A certificate of attendance will be provided after the event.

Contact

For further information about this course please contact …

Agreement to the privacy policy

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WEBINAR IDENTIFICATION CARD

Title of Webinar **Transcriptome analysis for PGRs**

Overview: How to design an NGS experiment to determine gene expression profiles for local cultivars of tomato

Description of the topic, aims of the webinar, learning outcomes, why and how the topic is related to Prograce

Speakers

Registration page Form

Title
Date
Time (EST), Time (PST), Time UK (BST), Time (CEST)

SIGN UP:
Email *
Confirm Email *
First Name *
Last Name *
Company *
Job Title *
Country *

Option for subscription to mailing list
Option for agreeing to the privacy policy

CONCLUSIONS

Development of stakeholder-specific Training Courses might improve efficiency of training and support capacity building

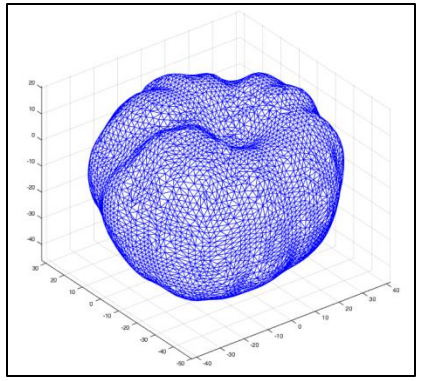
Training Courses organized jointly with the RIs like EMPHASIS, ELIXIR, DISSCO will enhance the quality of training capacity

Hands on Training Courses tailored for PGR infrastructures of Trainees will increase the GRACE RI impact on the PGR community

A survey on priorities for training among partners and stakeholders will assist in identifying Training Courses themes

TRAINING COURSE ORGANIZED
By ELIXIR, EMPHASIS and GRACE RIs

EMPHASIS involvement



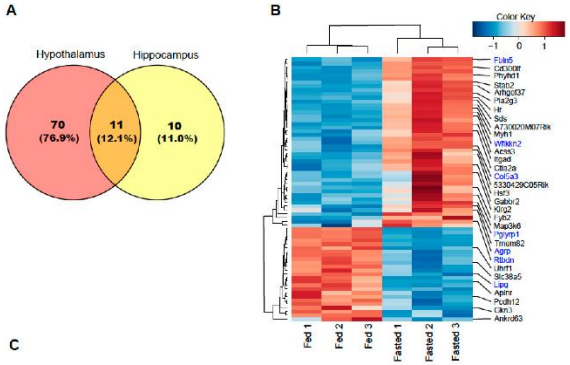
Phenotypic Analysis for Tomato fruit shape

GRACE-RI

omics analysis for fruit shape determination Genes, GWAS, QTLs

ELIXIR involvement

Bioinformatics analysis



PGR Training Infrastructures

Develop specific infrastructures for hands on Training services within the GRACE-RI network

TRAINING AND EDUCATION

Genomics Approaches:

In situ and small seed banks capacity for genotyping for haplotype detection -> Portable devices similar to GMO portable devices (for discussion in the workshop)

Data science and crop modeling for breeding (for discussion in the workshop)

Phytosanitation of contaminated unique material

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We propose the design and creation of a training platform

which could include all workshops / trainings / webinars

which will be organized

All those interested can register and sign up to get updates on new programmed training events and webinars. Create their own profile and keep track on what events they have participated in.

Included in the platform:

Links to useful information on the background each training course

Profiles of all trainers (Meet our experts)

Material that is used for training workshops (worksheets etc)

Zoom links for the events

The stakeholders of the proposed RI:

- plant scientists, seed companies, plant breeders, farmers
- seed conservation networks
- national and international agencies dealing with plant biodiversity

Promoters of the RI: stakeholders -> genebanks, large research institutes working on PGR

Utilizers of the RI: stakeholders -> individual plant scientists, seed companies, plant breeders, nurseries, farmers

Overlap of roles is envisageable:

Most genebanks will be able to implement the full spectrum of scientific services provided by the infrastructure,
and will thus become internal utilizers

Breeding companies may participate in the evaluation of PGR thus becoming external providers