

# WP7 - Training

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# WP7

TASK 7.1 Advanced **genotyping** training (months 7-48)  
**UNITUS**

TASK 7.2 Advanced **phenotyping** training (months 7-48)  
**NPPV**

TASK 7.3 Participatory **Plant Breeding** (PPB) training and the organization/management of Farmer Participatory Trials (FPT) (months 7-48)  
**NATURLAND**



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# Deliverables

No.	Title	Lead beneficiary	Dissemination level	time
D7.1	Production of materials for improved genotyping training	11 - UNITUS	Confidential, only for members of the consortium (including the Commission Services)	12
D7.2	Production of materials for improved phenotyping training	18 -NPPC	Confidential, only for members of the consortium (including the Commission Services)	12
D7.3	Production of materials for PPB and FPT training	12 - NATURLAND	Public	18
D7.4	Final report on WP7	11 - UNITUS	Public	60



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# WP7

TASK 7.1 Advanced **genotyping** training (months 7-48)

UNITUS

**4 workshops (5 days/ 12 participants)** for which 6 bursaries (500€)

1. Association genetics and marker-assisted breeding,
2. QTL identification for MAS,
3. Applications of transcriptomic,
4. ~~Proteomic methods~~/approaches in crop breeding,
5. Bioinformatics

Time table?

Locations?

UNITUS – Italy  
BOKU – Austria  
IFVC – Serbia  
IHAR – Poland  
NPPC - Slovakia



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Topics	Author/Editor
What is Genotyping?	Mario A. Pagnotta Barbara Pipan
Overview of Quantitative Genetics.	Mario A. Pagnotta
Population genetics and HW equilibrium	Mario A. Pagnotta
Genetic resources and their conservation	Mario A. Pagnotta
Comparison among methods and statistical software packages to analyze germplasm genetic diversity by means of codominant markers	Mario A. Pagnotta
Trait selection in agriculture	Barbara Pipan Vladimir Meglič
DNA extraction methods	Barbara Pipan
PCR (Polymerase Chain Reaction) – main principles	Ljiljana Kuzmanović
Gel electrophoresis	Ljiljana Kuzmanović
Markers and Molecular Tools	Mario A. Pagnotta
HRM High-Resolution Melting	Paola Forte
Real Time	Mario A. Pagnotta
Methods/strategies for QTL identification	Ljiljana Kuzmanović
MAS	Paola Forte
MAS in a selected crop	Barbara Pipan
MAS for bunt resistance	Hermann Bürstmayr Magdalena Ehn
MAS in organic potato breeding	Jaroslaw Plich
Association genetics	Ljiljana Kuzmanović
Sequences	Aleš Sedlar
Genotyping by Sequence	Marina Čeran
Genomic selection in R	Marina Čeran
Chromosome engineering	Ljiljana Kuzmanović
Fluorescent In situ hybridization - FISH or GISH	Paola Forte
Transcriptomics and its applications	Ljiljana Kuzmanović
Transcriptomics – biological interpretation of gene expression data	Aleš Sedlar
proteomics	Annamaria Timperio
TASSEL 3.0 Genotyping by Sequencing (GBS) pipeline documentation	Marina Čeran
Tassel Association	Marina Čeran
Data science in R	Aleš Sedlar
Statistical tests (Mean, St dev, Variance, correlation, ANOVA, etc.).	Mario A. Pagnotta
What is Bioinformatics? Manage sequences	Silvia Turco



# WP7.1 a) Genotyping

## UNITUS – Italy End of September 2020

- ✓ What is Genotyping?
- ✓ Overview of Quantitative Genetics.
- ✓ Genome-wide association studies (GWAS)
- ✓ Population genomics
- ✓ Markers and molecular markers
- ✓ PCR
- ✓ Real Time PCR
- ✓ HRM
- ✓ SNP Genotyping Assays
- ✓ QTLs
- ✓ Sequences
- ✓ Genotyping by Sequence
- ✓ MAS



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# WP7.1 b) molecular assisted breeding/selection

## IHAR – Poland

- ✓ Breeding principles for autogamous vs allogamous species
- ✓ Overview of breeding methods
- ✓ Genetic resources and their evaluations
- ✓ Trait selection in agriculture
- ✓ Genome-wide association studies (GWAS)
- ✓ Markers and molecular markers
- ✓ QTLs
- ✓ MAS



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# WP7.1 c) proteomic methods / approaches in crop breeding

## BOKU - Austria

- ✓ What is Genotyping?
- ✓ Overview of Quantitative Genetics.
- ✓ Genome-wide association studies (GWAS)
- ✓ Population genomics
- ✓ Markers and molecular markers
- ✓ PCR
- ✓ Real Time PCR
- ✓ HRM
- ✓ SNP Genotyping Assays
- ✓ QTLs
- ✓ Sequences
- ✓ Genotyping by Sequence
- ✓ MAS



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# WP7.1 d) associated biometrics

## IFVC – Serbia

- ✓ Experimental design
- ✓ Statistical tests (St dev, Variance, ANOVA, correlation, etc.).
- ✓ Population genetics
- ✓ Manage the metadata
- ✓ Bioinformatics
- ✓ Manage sequences
- ✓ Configs



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# WP7.2 - phenotyping

6 workshops (2 days/ 20 participants):

1. Phenotype traits and GxE interaction,
2. Automatic Phenotype technologies,
3. Results interpretation,
4. Qualitative vs quantitative traits,
5. Digital, thermal and hyperspectral imaging,
6. Biostatistics -informatics

Time table?

Locations?

NPPC – Slovakia  
UNEW - UK  
KIS - Slovenia



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# TASK 7.3 Participatory Plant Breeding (PPB)

Farmers where FPT are located will be used to host training activities  
24 workshops (1 days/ local participants):

1. PPB and the organization and management of Farmer Participatory field trials,
2. Concepts of selections in autogamous vs allogamous vs propagated crops,
3. Practical phenotyping selection,
4. Broad adaptability and GxE interactions,
5. Apply breeding and agronomic methodologies/approaches to select lines and genotypes,
6. Enhance seed production efforts,
7. Development of diverse, locally adapted plant populations,
8. *In situ* (on farm) conservation to improved resilience.

Time table?

Locations? NATUR-Germany, WSU-USA, UNEW-UK, NPPC- Slovakia, GEO- Greece,  
KIS-Slovenia, BOKU-Austria, CRI- Czech Republic, IFVC- Serbia, IHAR-Poland,  
UP- Hungary



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# WP 7 Training

Task 7.3. Participatory plant breeding (PPB) and the organization /management of Farmer Participatory Trials (months 7-48 = harvest years 2021, 2022)

Responsible partner: NATUR, partners involved: almost all

Each partner 2 training events  
Based on the project field trials.



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# Proposed timetable

year	1					2					3					4					5										
months	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	
	2018					2019					2020					2021					2022					2023					
	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
Task 7.1						D 1									T				T				T				T				
Task 7.2						D 2		W				W			W	W	W		W		W			W		W					
Task 7.3									D 3	2		2	2	2	2	2	2	2	2	2	2			2	2	2	2	2		2	2



# Advertise:

- Web sites
- E-mail (mailing lists)
- Bionet Austria ([www.bio-net.at](http://www.bio-net.at)),
- Czech Technology Platform for Organic Agriculture ([www.ctpez.cz](http://www.ctpez.cz)),
- Association of Organic Farming in Slovakia  
[www.ecotrend.sk/zvaz-ekologickeho](http://www.ecotrend.sk/zvaz-ekologickeho),
- the Association of Slovenian Ecological Farming and Chamber of Agriculture and Forestry of Slovenia ([www.kgzs.si/gv/eko.aspx](http://www.kgzs.si/gv/eko.aspx))

## Selection rules and committees for bursaries.

## Certificates.