ECOBREED

Overview of the project achievements and progress towards impact

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Kmetijski inštitut Slovenije
Agricultural Institute of Slovenia


BOKU
University of Natural Resources
and Applied Life Sciences, Vienna


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NPC
NATIONAL AGRICULTURAL
AND FOOD CENTRE


IHAR

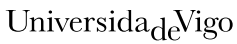

SAATGUT
AUSTRIA


Volakakis farms
Geokomi


Naturland


BIOMILA
PREMIUM


SECOBRA
Saatzucht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SEEDS


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Global
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MTA ATK


Kozlthely


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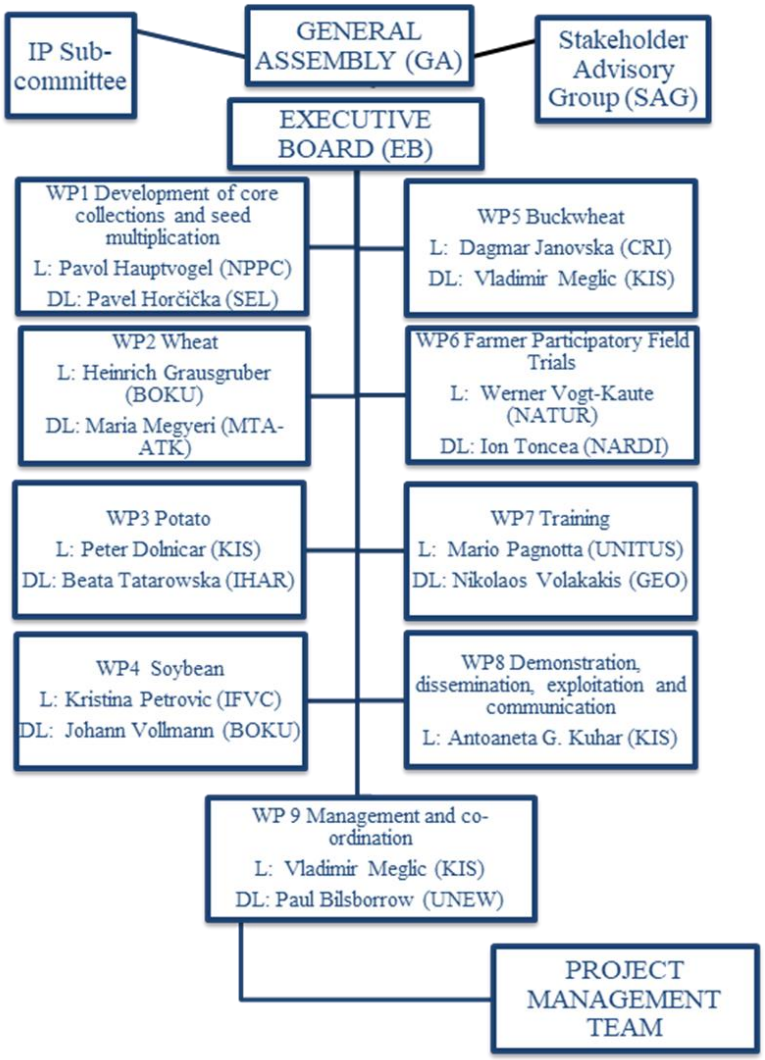
SAATZUCHT GLEISDORF

Organisation of work



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Project description

The **main focus** of **ECOBREED** is to **improve the availability of varieties** and **seed suitable for organic** and **low-input production**. Activities will focus on **four** crop species i.e. **wheat** (both common *Triticum aestivum* L. and durum *Triticum aestivum* L., T. *durum* L.), **potato** (*Solanum tuberosum* L.), **soybean** (*Glycine max* (L). Merr), and **common buckwheat** (*Fagopyrum esculentum* Moench.).

The project will develop (a) **methods, strategies and infrastructures for organic breeding**, (b) **varieties with improved stress resistance**, **resource use efficiency and quality** and (c) **improved methods for the production of high quality organic seed.** ECOBREED species have been selected for their potential contribution to increasing the competitiveness of the organic sector.

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Work completed

During this initial period, the project was mainly focused on the **acquisition, selection, evaluation, and multiplication** of genotypes and other materials for the needs of further studies and breeding and demonstration activities.
Work encompassed as well execution of some **preliminary studies and preparation activities**, among other preparation and validation of experimental protocols, educational and training material and planning of experiments and field trials.
To **identify potential genetic diversity** for each of the core species suited to organic production systems we have identified biological materials **from different environments across Europe** and other countries with a higher uptake of organic farming. A total of 916 accessions were identified including 200 samples of wheat, 197 potatoes, 256 soybeans and 263 of buckwheat with a subsequent phenotypic characterization of core collections across contrasting environments. We are creating an information database available for each target crop, facilitating further use of the genetic material for ECOBREED partners.

Wheat
- resistance sources against common bunt were identified and used in crosses with elite wheat cultivars
- test mycorrhiza compatibility and allelopathic effects
- crosses with genotypes from all partners started in order to develop new genetic diversity via a multi-parent advanced generation intercross (MAGIC) scheme including eight parents per population.

Potato
- varieties for phenotyping were planted at four locations
- marker-assisted selection for production of elite varieties have started.

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Soybean
- prime focus on screening of genetic resources and breeding material
- N-fixing capacity screening, experiment using different innocula and a trial using different cover crops were set up.

Buckwheat
- 216 buckwheat accessions were evaluated in three different environments
- first year of P mineralization trials completed
- in vitro test for allelopathic impact on selected monocot and dicot weed species set up
- re-sequencing of a Tartary buckwheat whole-genome (CAAS)
- first crosses made towards production of new varieties.

Training
- started to develop training programmes.

Dissemination and communication
- project objectives and expected outcomes have been broadly disseminated at European and international levels targeting scientific audience, policymakers, and the general public.

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Summary of submitted deliverables

Del Rel. No	Title	Lead Beneficiary	Nature	Dissemination Level	Est. Del. Date (annex I)	Receipt Date	Status
D1.1	Inventory of genetic resources for each target species	NPPC	Report	CO	31 Oct 2018	07 Dec 2018	Submitted
D1.2	Putative collection of each target species identified	NPPC	Report	PU	31 Jan 2019	29 Jan 2019	Submitted
D1.3	Distribution of species core collections among partners	NPPC	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D2.1	Phenotypic data management system for wheat produced for partners	BOKU	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D3.1	Phenotypic data management system for potato produced for partners	IHAR	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D4.1	Phenotypic data management system for soybean produced for partners	IFVC	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D5.1	Phenotypic data management system for buckwheat produced for partners	CRI	Report	CO	31 May 2019	25 May 2019	Submitted
D6.1	Establishment of FPT data management and recording system	UNEW	Report	CO	31 Jul 2019	19 Jul 2019	Submitted
D7.1	Production of materials for improved genotyping training	UNITUS	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D7.2	Production of materials for improved phenotyping training	NPPC	Report	CO	30 Apr 2019	30 Apr 2019	Submitted
D7.3	Production of materials for PPB and FPT training	NATUR	Report	PU	31 Oct 2019	30 Oct 2019	Submitted
D8.7	Data Management Plan	BOKU	ORDP	CO	31 Oct 2018	16 Jan 2019	Submitted
D8.8	First Practice Abstract	NPPC	www, etc.	PU	31 Oct 2019	30 Oct 2019	Submitted
D9.1	Project start-up meeting minutes and report	KIS	Other	CO	30 Jun 2018	12 Jul 2018	Approved
D9.2	Project Management meeting 1 minutes and report	KIS	Other	CO	30 Apr 2019	14 Jul 2019	Submitted
D10.1	H - Requirement No. 1	KIS	Ethics	CO	31 Oct 2018	29 Oct 2018	Submitted
D10.2	NEC - Requirement No. 2	KIS	Ethics	CO	31 Oct 2018	07 Dec 2018	Approved
D10.3	POPD - Requirement No. 3	KIS	Ethics	CO	31 Oct 2018	08 Dec 2018	Submitted

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Summary of milestones achieved

No	Name	Lead beneficiary	Delivery date	Comment
1	Identification of accessions and exchange of seed from genebanks, breeders and partners	NPPC	30 Jun 2018	Identification of crop accessions and exchange has begun on lists from gene banks, breeders and partners. The total of 916 accessions were identified and were exchange of seed, breeders and partners. The total number were 200 wheats, 197 potatoes, 256 soybeans and 263 buckwheat's.
2	Web-site developed	KIS	30 Jun 2018	www.ecobreed.eu
3	IP sub-committee established	KIS	30 Jun 2018	During the Kick off Meeting 5 members of the IP subcommittee proposed and subcommittee established.
4	Selection of putative collections for each species	NPPC	31 Oct 2018	Selection of putative collections for each species has begun. Putative collection of each target species identified.
5	Exchange of seed materials among partners	NPPC	31 Oct 2018	Wheat seed material exchanged. Plans for the exchange of material for other three spring crops are made and waiting for execution.
6	Communication strategy developed	KIS	28 Feb 2019	Communication strategy developed and discussed with partners.
7	Multiplication of seed for phenotyping	NPPC	30 Apr 2019	For spring crops all activities have started.
26	Development of training materials for TASK 7.2	NPPC	30 Apr 2019	Task 7.2 training material developed. Document "Production of materials for improved phenotyping training" contains information on techniques available for advanced phenotyping.
15	Delivery of DNA samples to CAAS for genotyping	CAAS	30 Apr 2019	First set of DNA extracted and sent to the CAAS.
23	FPT data management system sent to partners for translation	NATUR	30 Apr 2019	Materials prepared and distributed for translation.
25	Development of training materials for TASK 7.1	UNITUS	30 Apr 2019	Task 7.1 training material developed.
9	Phenotyping data management system sent to partners	UNEW	30 Apr 2019	Data management system shared with partners.
21	Identification of potential advanced phenotypic screening methods and development of protocols for N fixation to be evaluated	BOKU	30 Apr 2019	Screening methods identified.
12	Selection of suitable markers for screening, sharing of protocols between partners, allocation of traits between partners	IFVC	31 May 2019	Suitable markers and protocols for all 4 crops were initially selected, along with provisional ones for genotyping. Markers and protocols are subject to further optimization and upgrading within the ongoing work.
16	Selection of sub-set of core collection for P mineralisation study in buckwheat and delivery of seed to partners	CRI	31 May 2019	Set of 11 genotypes selected, seed and experimental design along with evaluation sheets sent to partners.
11	Selection of sub-set from core collection for allelopathic screening	UVIGO	31 May 2019	Wheat and buckwheat seeds samples received from the partners.
10	AM-mycorrhizal soil inocula strains received by partners	UNEW	31 May 2019	Both partners had received the required inocula.
29	1st IP exploitation report	KIS	31 Jul 2019	All IP issues discussed and the content agreed during the annual meeting.

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Progress towards expected impact

Expected impacts are still relevant. The ECOBREED project will provide an increased availability and quality of seeds and varieties suited to the specific conditions of organic and low-input farming. It will screen and provide germplasm for use in breeding programmes for the improvement of the 4 target crop species. Through the project we will provide extensive training, demonstration, dissemination, exploitation and communication activities to facilitate rapid technology transfer and introduction of innovations from the project into commercial practice.

Drawback
Missmatch of the project start with the spring crops season.

We have started to provide

- a basis for better availability and quality of seeds and varieties suited to the specific conditions of organic and low-input farming
- additional information on genetic variation that has been added to the already existing Genebank data information services
- set of genotypes that are best adapted to the regional organic management systems, organic breeding activities will be strengthened and boosted and the genetic diversity increased
- a basis to establish a regional organic breeding programmes with the help of ECOBREED
- first training documents and joint activities with Bresov and Liveseed
- dissemination and communication activities to facilitate rapid technology transfer and to increase organic farmers' awareness of organic seeds and organic varieties and the necessity of using those

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