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# ECOBREED ORGANIC BREEDING CONFERENCE

## BOOK OF ABSTRACTS

ecobreed
IMPROVING CROPS

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# ECOBREED Organic Breeding Conference

## Book of Abstracts

**17 – 19 January 2024**

Ljubljana, Slovenia

April 2024

Ljubljana

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# ECOBREED Organic Breeding Conference

## 17 – 19 January 2024

Glass Hall, Grand Hotel Union Eurostars,
Miklošičeva cesta 1, 1000 Ljubljana, Slovenia

**Programme**

| Wednesday, 17 January 2024 | |
|---|---|
| 8:30 | Registration |
| 9:00 | **Welcome & opening of the conference**<br>• **Vladimir Meglič**, Agricultural Institute of Slovenia<br>• **Andrej Simončič**, Agricultural Institute of Slovenia<br>• **European Commission** (speaker TBA)<br>• **Joži J. Cvelbar,** Agriculture Directorate, Ministry of Agriculture, Forestry and Food of Republic of Slovenia |
| 9:45 | **Session 1: The Organic Landscape and Policy Changes**<br>Chair: Vladimir Meglič, Agricultural Institute of Slovenia<br>Invited lectures:<br>• **Freya Schäfer**, FiBl Germany e.V.:<br>*Fostering Organic Seed Production and Use*<br>• **Werner Vogt-Kaute**, Naturland e.V.:<br>*ECOBREED Contribution to the EU Organic Policy* |
| 10:45 | Coffee break & networking in the Garden Hall |
| 11:15 | **Session 1: The Organic Landscape and Policy Changes**<br>***Round Table on Organic Breeding, Varieties, (O)HM and Seed Availability***<br>Moderator: **Paul Bilsborrow**, University of Newcastle<br>• **Micaela Colley**, Organic Seed Alliance, USA<br>• **Freya Schäfer**, FiBL, Germany e.V.<br>• **Hubert Kempf**, SECOBRA Saatzucht GmbH<br>• **Anna Pearce**, LC Smales & Son Ltd<br>• **Samanta Dömötörová**, Ministry of Agriculture and Rural Development, SK<br>• **Monika Messmer**, FiBL Switzerland<br>• **Maja Žibert,** Agriculture Directorate, Ministry of Agriculture, Forestry and Food of Republic of Slovenia |
| 13:00 | Lunch & networking in the Garden Hall |


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14:00 **Session 2: Plant Breeding and Genetics for the Improvement of Organic Varieties**

Chair: Heinrich Grausgruber, University of Natural Resources and Life Sciences

Invited lectures:

- **Hubert Kempf**, SECOBRA Saatzucht GmbH:
  *Breeding Wheat Cultivars for Organic Agriculture – the Way of Secobra Saatzucht*
- **Michael Schneider**, FiBL Switzerland:
  *Precise OHM Tracing by Genomics*

15:00 **Session 2: Plant Breeding and Genetics for the Improvement of Organic Varieties**

Chair: Heinrich Grausgruber, University of Natural Resources and Life Sciences

- **Heinrich Grausgruber**, University of Natural Resources and Life Sciences
  *Marker-Assisted Selection in Wheat for the Improvement of Organic Varieties*
- **Mario A. Pagnotta**, University of Tuscia:
  *Organic Seeds Breeding in Durum Wheat for Mediterranean Environment*
- **Dagmar Janovská**, Crop Research Institute:
  *From the Gene Bank to the Field: Utilizing the Diversity of the Gene Bank in Buckwheat Breeding*
- **Pavel Horčička**, Selgen, a.s.:
  *Wheat Yield and Quality under Conventional and Organic Farming*
- **Discussion**

17:00 **Poster session**

with food & networking in the Garden Hall

## Thursday, 18 January 2024

9:00 **Sub-session 2a: Genomic Tools for Organic Breeding**

Chair: Vladimir Meglič, Agricultural Institute of Slovenia

Invited lecture:

- **Meiliang Zhou**, Chinese Academy of Agricultural Sciences:
  *Research and Utilization of Buckwheat Germplasm Resources*

9:30 **Sub-session 2a: Genomic Tools for Organic Breeding**

Chair: Vladimir Meglič, Agricultural Institute of Slovenia

- **Barbara Pipan**, Agricultural Institute of Slovenia:
  *Buckwheat Germplasm: In-Depth Characterisation of Agro-Morphological and Genetic Diversity*
- **Vuk Djordjević**, Institute of Field and Vegetable Crops:
  *Marker-Assisted Selection for Soybean Organic Breeding*
- **Matilda Ciucă**, National Agricultural Research and Development Fundulea:
  *Screening European Winter Wheat Germplasm for Rusts Resistance Alleles using Molecular Markers*

10:30 **Sub-session 2b: Conventional and Advanced Phenotyping**

Chair: Peter Dolničar, Agricultural Institute of Slovenia

- **Uroš Žibrat**, Agricultural Institute of Slovenia:
  *Phenotyping of Winter Wheat Genotypes - Taking (some) of the Shine off*


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- **Ankush Prashar**, University of Newcastle:
  *Exploring High Throughput Tools for Decision Making in Potato*
- **Pedrag Randjelović**, Institute of Field and Vegetable Crops:
  *Soybean and High-throughput Phenotyping: Perceiving Growing Patterns in Different Environments*
- **Aleš Kolmanič**, Agricultural Institute of Slovenia:
  *Assessing the Competitive Ability of Winter Wheat (Triticum aestivum* L.*) Varieties against Weeds*

12:00 Lunch & networking in the Garden Hall

13:00 **Sub-session 2c: Organic Breeding – Methodologies and Strategies (PPB)**

Chair: Dagmar Janovská, Crop Research Institute

Invited lecture:

- **Micaela Colley**, Organic Seed Alliance, USA:
  *Exploring the Emergence of Participatory Plant Breeding in Countries of the Global North*

13:30 **Sub-session 2c: Organic Breeding – Methodologies and Strategies (PPB)**

Chair: Dagmar Janovská, Crop Research Institute

- **Peter Dolničar**, Agricultural Institute of Slovenia:
  *Participatory Plant Breeding Strategies in Organic Potato Breeding Program at Agricultural Institute of Slovenia*
- **Vuk Djordjević**, Institute of Field and Vegetable Crops:
  *Organic Soybean: ECOBREED Partner Contribution*
- **Gyula Vida**, ATK Centre for Agricultural Research:
  Genetic Variability of Gluten Strength and Yellow Pigment Content in a Set of Winter and Facultative Durum Wheat under Low-Input Conditions

14:30 **Sub-session 2d: Young Researchers**

Chair: Mario A. Pagnotta, University of Tuscia

- **Luca Bonfiglioli**, University of Tuscia:
  *Durum Wheat Characterization for Organic Agriculture and for Tolerance to Drought and Salinity*
- **Marjana Vasiljević**, Institute of Field and Vegetable Crops:
  *Fostering Farmer Engagement: ECOBREED Participatory Trials on Organic Soybean in Serbia*
- **Janez Lapajne**, Agricultural Institute of Slovenia:
  *Enhancing Potato Crop Analysis with Machine Learning and Multispectral Imaging in Field Conditions: A Study on Explainable AI Techniques*

- **Ana Vojnović**, Agricultural Institute of Slovenia:
  *Spectral Responses of Slovenian Potato Varieties under Water-Restriction Stress*
- **Marion Champailler**, Agricultural Institute of Slovenia:
  *Farmer Participatory Trials: Case study in Slovenia*


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## Friday, 19 January 2024

**9:00 — Session 3: Variety Evaluation and Farmer Participatory Trials**

Chair: Paul Bilsborrow, University of Newcastle

Invited lectures:

- **Salvatore Ceccarelli**, independent consultant:
  *Variety Evaluation and Farmer Participatory Trials*
- **Klemens Mechtler**, AGES - Austrian Agency for Health and Food Safety:
  *Testing Agricultural Varieties for Organic Farming in Austrian VCU-System*

**10:00 — Sub-session 3a: Variety Evaluation**

Chair: Paul Bilsborrow, University of Newcastle

- **Péter Mikó**, ATK Centre for Agricultural Research:
  *Comparison of Agronomic and Quality Parameters of a Durum Wheat Diversity Panel Grown in Hungarian Organic, Low Input and Conventional Fields*
- **Soňa Gavurníková**, National Agricultural and Food Centre:
  *Qualitative analysis of European winter wheat tested within the ECOBREED project*
- **Primož Titan**, RGA d.o.o.:
  *Perennial Wheat in Reality*

**11:00** Coffee break & networking in the Garden Hall

**11:30 — Sub-session 3b: Farmer Participatory Trials**

Chair: Werner Vogt-Kaute, Naturland e.V. & Paul Bilsborrow, University of Newcastle

- **Werner Vogt-Kaute**, Naturland e.V.:
  *Environmental Stability of Wheat Populations in ECOBREED Farmers Participatory Trials*
- **Werner Vogt-Kaute**, Naturland e.V.:
  *Protein-Yield – an Interesting Metrics for Organic Varieties*
- **Paul Bilsborrow**, University of Newcastle:
  *The Performance of Varieties, Populations and Mixtures of Winter Wheat from UK Farmer Participatory Trials*
- **Anna Pearce**, LC Smales & Son Ltd:
  *The Potential of Seed Dressings & Biostimulants for Organic Production*
- **Adam Brezáni**, PRO-BIO obchodní společnost s r.o.:
  *Buckwheat, a Special Chance for Eastern Europe?*

**13:00 — Closing of the conference**


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## Introduction

The project ECOBREED (*Increasing the efficiency and competitiveness of organic crop breeding*) is funded by the European Union Horizon 2020 funding scheme and brings together 24 partners from 14 different countries. The project ran for 5 years and had €6.2 million of funding available for activities.

ECOBREED aims to increase the availability of seeds and varieties for the organic and low-input sectors, to identify traits and combinations of traits suited to organic and low-input production environment including high nutrient use efficiency and weed competitiveness and to increase breeding activities for organic and low-input crop production.

The project developed methods, strategies and infrastructure for organic production, varieties with improved stress tolerance, higher efficiency and quality, and improved methods for producing high quality organic seed. One of the most visible results of the project is the registration of new plant varieties available under our registered trademark "ecobreed IMPROVING CROPS". Among the results, we can also highlight the improvement of pest control methods in organic production of potatoes, soybeans, wheat and buckwheat.

The ECOBREED Organic Breeding Conference took place from 17 to 19 January 2024 in Ljubljana, Slovenia. The three-day conference attracted more than 90 participants from 14 European countries as well as participants from China and the USA.

At the final conference, we presented a summary of the results of the ECOBREED project and invited high-level experts in the field to contribute to the conference: Salvatore Ceccarelli, an independent organic farming consultant, Micaela R. Colley from the Organic Seed Alliance, Klemens Mechtler from the Austrian Agency for Health and Food Safety (AGES), Freya Schäfer from the German Research Institute for Organic Agriculture (FiBL), Michael Schneider from the Swiss Research Institute for Organic Agriculture (FiBL) and many others.

There was also a very insightful Round Table on Organic Breeding, Varieties, (O)HM and Seed Availability with organic breeding and organic seed production experts (see livestream here).


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# Soybean and high-throughput phenotyping: perceiving growing patterns in different environments

**Predrag Randjelović*, Vuk Djordjević, Jegor Miladinović, Marina Ćeran, Simona Jaćimović, Vojin Djukić, Marjana Vasiljević**

Institute of Field and Vegetable Crops, Novi Sad, Serbia

**predrag.randjelovic@ifvcns.ns.ac.rs*

In the previous decade, new technologies based on remote sensing and photogrammetry were established as a powerful tool for non-destructive estimation of different plant traits. The high-throughput phenotyping (HTPP) implies the utilization of these tools and techniques, resulting in a fast and accurate assessment of crop development data. In soybean breeding, traditional phenotyping is recognized as a bottleneck in the current selection of superior lines mainly because of the inefficiency and resource consumption. The HTPP could be applied to overcome these shortcomings and not just for the prediction of plant characteristics from a single time point but also for perceiving crop growth based on multi-temporal data. This study aimed to analyze soybean growing patterns in different environments (drought and control) based on the estimated height and biomass of 206 genotypes (early and late varieties) sown in 2020 and 2021. In both seasons, each trait was predicted in eight-time points with previously developed HTPP models and protocols. The estimated values were used to create growing curves and evaluate analyzed genotypes based on their performance. Early varieties were dominant for both traits in drought conditions. In the control, the late material performed better regarding height while early genotypes accumulated more biomass.



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