

**Summary report  
of the**

**Joint ECPGR Maize Working Group, Malanirs project and  
EVA Maize meeting**

**2 October 2025  
Zemun Polje, Serbia**



## Contents

Participants .....	2
Meeting minutes .....	3
Maize WG .....	3
MALANIRs Grant Scheme Activity .....	3
EVA Maize network .....	4
Annex 1 – Meeting Agenda.....	7
Annex 2 – Action points .....	8

## Participants

**In person:** Violeta Andjelkovic, MRIZP, Serbia; Carlotta Balconi, CREA, Italy; Gönül Cömertpay, DATAEM-TAGEM, Turkey; Domagoj Simic, Agricultural Institute Osijek, Croatia; Natalija Kravic, MRIZP, Serbia; Stéphane Nicolas, INRAE, France; Hrvoje Sarcevic, University of Zagreb, Croatia; Sandra Goritschnig, ECPGR, Italy; Claire Tailfer, INRAE, France

**Online:** Agustin Galaretto (INRAE), Lisa Achathaler (AGES), Najada Kadiasi, (Agricultural University Tirana), Sylvia Vogl (AGES), Pedro Revilla (MBG-CSIC), Aloïs GOURRION (RAGT), Rita Redaelli (CREA-CI), Cyril Bauland (INRAE), Danela Murariu (Suceava Genebank), Elisabetta Frascaroli (University Bologna), Ana Maria Barata (INIAV), Rosana Malvar (MBG-CSIC), Carlos Gaspar (INIAV), ANDRÉ REIS PEREIRA (ESAC), Olabisi Yusuf (van Waveren Saaten), Martin Ecartot (INRAE), Patricia Faivre Rampant (INRAE), Laurence Moreau (INRAE), Damien Hinsinger (EPGV), Delphine Madur (INRAE GQE Le Moulon), Wiebke Sannemann (KWS) Dimitri Sanchez (LIDEA) Ana Butron (MBG-CSIC)

## Meeting minutes

On 2 October 2025, nine members of the ECPGR Maize Working Group, who also participate in the EVA Maize network and Malanirs project, met on the sidelines of the scientific conference organized on the occasion of the [80-year anniversary of the Maize Research Institute Zemun Polje \(MRIZP\)](#) in Belgrade, Serbia. In this hybrid meeting, to which 24 participants connected online, we received updates and discussed issues and planning for the projects. The Agenda is attached in Annex 1.

### Maize WG

The Maize WG finalized the [crop-specific conservation standards for Maize](#), which were developed as part of the German-funded [New AEGIS](#) project.

A short discussion emerged related to the desired relative humidity (RH) during storage of maize samples. Kernels should be dried to below 12-13% humidity, and fridges or cold rooms should aim to be below 40-50% RH. Comments from INRAE concerned the suggestion to request sampling of more plants during acquisition to ensure representative diversity in the accession, and the recommendation to make it mandatory to conserve at least two seed lots for regeneration for each stored accession.

Claire Tailffer, the new genebank manager at INRAE Montpellier, presented their ongoing work on optimizing the regeneration protocol.

Carlotta Balconi (CREA-CI, Italy) was nominated and elected as vice-chair for the Maize WG. She was invited to attend the upcoming ECPGR WG Chairs meeting in Spain (March 2026) and involving a vice chair will help share the workload. WG members were invited to be more involved in WG activities.

### MALANIRs Grant Scheme Activity

Stéphane Nicolas and partners updated on the progress within the [MALANIRs project](#), summarizing the project objectives and proposing that new partners (e.g. Bulgaria) could join with their own funding.

The targeted sequencing of 500 maize landraces is underway with a 12k SNP panel defined in the framework of [MineLandDiv](#) project, using TECAN technology. The SNP panel is currently in the final phases of design and synthesis, and as soon as all DNA samples pass QC, the targeted sequencing will be finalized by the beginning of 2026 depending on availability of the sequencing platform. The data analysis pipeline for retrieving the genotyping data from sequencing data is in place but will likely take some time to run. A file with all samples included in the genotyping will be shared in order to complete missing metadata, also some SMTAs were still missing and should be finalized. Once all metadata are completed by all genebank partners, the accession metadata will be synced with EURISCO and uploaded to the EURISCO-EVA intranet. Additional passport information was collected and DOIs created; these should be used to update the EURISCO data, for which engagement with national focal points (NFPs) will be necessary.

Field trials were conducted in 2025 in Zagreb and Belgrade, on 100 and 176 accessions, respectively, with seeds from a panel of landraces defined in the framework of the MineLandDiv project. Field-collected data will be uploaded to the EURISCO-EVA intranet. The trial in Zagreb suffered from a lack of rain and hot conditions in June, resulting in bad conditions during tasseling of early landraces. Plots were overplanted, and not much lodging was observed; harvest was

planned for October. Natalija Kravic reported that the trial at MRIZP was being harvested manually at the moment, because many plants were broken and lodged. They had the same weather conditions as Zagreb. Harvested kernels could be analyzed by NIRs for calibrating a model for phenomic prediction, using the field data to develop the prediction equations. For this, it was suggested to adapt the existing equation for hybrid seed in a calibration for heterogeneous landraces.

A ring test between different NIRS labs is planned in the framework of the MineLandDiv project in 2025 on a subset of 20 accessions to standardize the equation, involving CREA-CI, MBG-CSIC and INRAE, and it could be extended to MALANIRs partners who may express interest. INRAE has spectra from two instruments, at AGAP Institut and Diascope, but these are very different and would need to be standardized. They have collected 15 effective spectra on seeds harvested in CREA MineLandDiv trials in 2025 that are part of MineLandDiv ring test led by CREA-CI, comprising 20 individuals. More have to be collected to improve standardization. Partners were requested to share data with Martin Ecartot and Rita Redaelli, who are coordinating the ring test. It was noted that very different materials should be included in the calibration, for which at least 100 samples are needed, and that it may be difficult to predict starch from NIRS on whole kernels.

M. Ecartot updated on progress for the NIRS activity. The NIRS experiment on seeds from genebanks is planned to be completed by the end of 2025, conducted at INRAE Montpellier (AGAP Institute). Some missing seed samples of the EVA panel were requested from partners. The NIRS analyses for the whole collection of 1,200 samples of seeds originating from different genebanks are scheduled for November 2025, with complementing wet lab experiments planned for a subset of 100 samples, for which 250g of kernels would be needed and which will be done at own cost at INRAE Montpellier.

Experiments for 2026, especially field trials which could be linked to NIRS analyses, need to be planned by January 2026 at the latest.

## **EVA Maize network**

Within the [EVA Maize network](#) the focus is currently on data analysis and valorization, and partners presented their progress.

Rosana Malvar reported on a paper on drought resilience<sup>1</sup>, which used the EVA network landraces in separate trials and identified two who would provide useful diversity in breeding for drought resilience. The data can be made available and will be uploaded to the EURISCO-EVA database. She also reported on the ongoing analyses and noted that the trials were not very well balanced, using factorial regression in the analysis of data from 31 trials in seven locations. She suggested to improve on the trial design in future evaluations. Meteorological data had been collected from all trials and is being used by both R. Malvar and Agustin Galaretto in their analyses.

Cyril Bauland shared some ANOVA on the testcross populations and expects to ultimately provide overall values for the C evaluations, adjusted for genetic structuring. He shared a table with adjusted means, covering all sites and testers, accounting for the interaction between genetic structure and tester on all the usable variables. The ANOVA model needs to be validated, but elaborated data could be useful and will be integrated into the Thalia database output. As

---

<sup>1</sup> Santiago R, R.A. Malvar, P. Revilla, A. Butrón (2025) Maize landraces as useful donors of genetic diversity for resilience to drought, *Journal of Agriculture and Food Research*, Volume 23, <https://doi.org/10.1016/j.jafr.2025.102297>

discussed in the Bergamo meeting, there are still some seed stocks available of the testcrosses which could be used in trials including all three sets at the same time, to complement and consolidate the existing data.

A. Galaretto has continued to work on the EVA data, with the objective to develop an efficient method to characterize large maize landrace collections and to identify promising landraces adapted to present/future climate for pre-breeding. He presented preliminary results at Eucarpia in Bologna and at the MRIZP conference. He is currently preparing a draft scientific paper, which describes an approach combining genomic prediction, genomic offset and climate data to predict adaptation to future climate scenarios. He showed that prediction accuracy improves by including diversity (Hs) and genomic offset parameters. The analyses used male flowering time, as it was closely related to female flowering, with data transformed into location-dependent growing degree days. Partners noted that drought during flowering in Eastern Europe is detrimental to maize production, and more research on this topic and testing of landraces in pre-breeding is needed and could be discussed in the paper. Carlotta also suggested checking the ideotypes considering future environments. Partners were invited to provide feedback on the draft paper, and the intention is to submit it by the end of 2025.

The INRAE Thalia DB database will be used to include elaborated phenotypic data (including adjusted means, genomic predictions and offset, testcross values), along with genotypic and genetic structuration data. MALANIRS and EVA Partners will receive login information and the data will be made publicly available after publication of the associated papers. With these data, the Thalia DB could serve as a breeders' catalogue where they can access the main analysis outputs for all relevant traits. Delphine Madur and Yannick de Oliveira will present a demonstration of the Thalia DB in the next virtual meeting.

Ideas were shared on how to ensure the best valorization of the existing EVA panel by all partners, and it was suggested to finalize the analysis on all available materials (from EVA, MineLandDiv and MALANIRs) before proceeding with more planning. S. Nicolas noted that in MineLandDiv, the trial design was complete and could be used for planning of future evaluations. It would be interesting to also include data from the PRIMA project Dromamed in the combined analysis, to make the results interesting and available to breeders and farmers. GWAS have already been done for different traits using adjusted means.

Biotic stress trials would be very useful, but should also be better planned. C. Balconi noted that artificial inoculation with *Fusarium* may not be so meaningful for landraces, and it would be better to check for natural infections in multi-year trials, but this would likely need funding. Alternatively, artificial infections could be applied to testcross populations, which are more homogeneous than landraces. Ideally, to fully cover the biotic stress response across our Maize collections, a new project should be proposed with sufficient funding for disease trials using spray inoculation during optimal silk stages, and also to record mycotoxin levels.

The EVA, MineLandDiv and MALANIRs collections could be the combined basis for a new, more diverse European Maize landraces core collection (EUMLCC) which would represent the wide diversity of maize in Europe and could be the basis for future research and evaluations within the network.

The protocols for standard evaluation will also be finalized for publication on the EVA website and in appropriate repositories.

Overall, the meeting sparked interesting discussions and highlighted the interconnections of the different activities within the ECPGR Maize community. Action points for the different projects and communities are summarized in Annex 2.

## Annex 1 – Meeting Agenda

**Venue:** Maize Research Institute Zemun Polje, Serbia

<b>THURSDAY 2 OCTOBER 2025</b>		
09:00 – 09.30	Transfer to MRIZP and Registration	
	<b>Welcome and introductory session</b>	
09.30 – 09.40	Welcome by local host, ECPGR Approval of agenda	<i>V. Andjelkovic</i> <i>S. Goritschnig</i>
09:40 – 10:30	<b>Maize WG meeting</b>	<b>CHAIR: V. ANDJELKOVIC</b>
	Updates from WG activities Review and approval of Maize genebank standard	<i>V. Andjelkovic</i>
<b>10.30 – 11:00</b>	<b>TEA/COFFEE BREAK</b>	
	<b>MALANIRS meeting</b>	<b>CHAIR S. NICOLAS</b>
11:00 – 13.00	Review of project progress <ul style="list-style-type: none"> <li>• MALANIRS maize collection, genotyping and SMTA</li> <li>• Field and NIRS experiments</li> </ul> Outlook and work planning for activities in 2026	<i>S. Nicolas</i>  <i>H. Sarcevic</i> <i>M. Ecartot</i>
<b>13:00 - 14:00</b>	<b>LUNCH</b>	
	<b>EVA Maize meeting</b>	<b>CHAIR: S. GORITSCHNIG</b>
14:00 – 16:00	Update on EVA networks Review of data analysis and dissemination Public availability of data Outlook and work planning for activities in 2026	<i>S. Goritschnig</i> <i>R. Malvar, A. Galaretto</i> <i>S. Nicolas</i> <i>S. Goritschnig</i>
16:00 – 16:30	General discussion on synergies and collaboration Any other business	<i>All</i>
16:30	Close of meeting	

## Annex 2 – Action points

	Activity	Responsible	Due date
<b>Malanirs</b>			
1	Collect all seed samples for NIRS testing	M. Ecarnot, S. Nicolas	2025-10-31
2	Collect and combine all metada for MALANIRs accessions	D. Madur with all genebank that provide seeds	2026-01-31
3	Liaise with NFPs for update of passport data on EURISCO as necessary	S. Goritschnig to liaise with S. Weise	2026-01-30
4	Collect data of MALANIRs field trials	H. Sarcevic, N. Kravic	2025-12-31
5	Upload metadata and phenotypic data to EURISCO-EVA	S. Goritschnig	2025-12-31
6	Define work plan for ring test and identify partners who would complement with wet lab analysis	M. Ecarnot, R. Redaelli	2025-12-31
7	Plan experiments for 2026	S. Nicolas, with Malanirs partners	2026-01-31
<b>EVA Maize network</b>			
8	Upload metadata and phenotypic data from drought experiments to EURISCO-EVA	R. Malvar, S. Goritschnig	2025-12-31
9	Continue analysis of testcross populations and evaluate possibility to publish	C. Bauland	2026-01-31
10	Check on possibility and interest to conduct full trials with remaining testcross populations in 2026	S. Goritschnig	2026-01-31
11	Work on draft paper on genomic prediction and offset and prepare to submit	A. Galaretto and co-authors	2025-12-31
12	Collect partner information to receive login for Thalia DB	S. Goritschnig, D. Madur	2025-12-31
13	Schedule a demonstration of Thalia DB	S. Goritschnig, D. Madur, Y. de Oliveira, S. Nicolas	2026-01-31
14	Consider funding options for dedicated biotic stress evaluation of combined maize collections	All partners	
15	Develop updated EUMLCC based on data from all connected projects.	P. Revilla, V. Andjelkovic, S. Nicolas	
16	Schedule virtual meeting to update on progress in MALANIRs and EVA analyses	S. Goritschnig	2026-06-30