



WHEAT  
INITIATIVE



## Meeting of the EWG Durum Wheat Genomics and Breeding

Bari – Italy, 17-18 October 2023  
Aula Magna 'Aldo Cossu' Palazzo Ateneo  
Via Crisanzio I - Bari – Italy

### LOCAL ORGANIZERS

Luigi Cattivelli, Agata Gadaleta, Anna Maria Mastrangelo, Ilaria Marcotuli, Stefania Lucia Giove

### SCIENTIFIC COMMITTEE

- Luigi Cattivelli, CREA GB - Italy
- Agata Gadaleta, UNIBA - Italy
- Anna Maria Mastrangelo, CREA CI - Italy
- Karim Ammar, CIMMYT -Mexico
- Jemanesh Haile, University of Saskatchewan - Canada

### Is sufficient resistance to *Fusarium* head blight in durum wheat truly achievable?

*Fusarium head blight* (FHB) is a widespread disease, resulting in grain yield losses and drastic grain quality deterioration because of mycotoxin contaminations, particularly in the form of deoxynivalenol (DON), the predominant and most economically important mycotoxin for wheat. *F. graminearum* is the main causal agent of FHB worldwide. In the last years *Fusaria* increase their spread and accumulate more of their related mycotoxins on durum wheat grain production at maturity. Although variation for resistance to FHB is known, no wheat variety is completely immune and durum wheat is particularly and almost universally highly susceptible to FHB. In the resistance or tolerance response to FHB, several biochemical components are involved and different quantitative traits (quantitative trait loci, QTL) capable of controlling this disease have been identified.

The meeting organized by the Expert Working Group on Durum Wheat Genomics and Breeding will present an overview of the most significant advances in genetic/genomic research on tolerance to FHB in durum wheat and will promote a discussion on future perspectives on their application in breeding practices to effectively improve durum wheat tolerance and reduce the accumulation of mycotoxins in grain.

On the second day, the meeting will also present an update on the most recent advances in durum wheat genomics, focusing on the 'Svevo' platinum quality reference genome and on the tetraploid wheat pangenome.

The meeting will start on October 17<sup>th</sup> at 9 am and will close on 18<sup>th</sup> at 2 pm.



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Consiglio per la ricerca in agricoltura  
e l'analisi dell'economia agraria

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### Tuesday 17<sup>th</sup> of October 2023

9:00 - 9:20 Opening ceremony

Welcome address by EWG chair Luigi Cattivelli, WI Scientific Committee representative Roberto Tuberosa, and Institutional Authorities: Director of the Department of Soil, Plant and Food Sciences, Maria De Angelis

### Overview on Fusarium head blight tolerance in durum wheat

***Chairs:*** Agata Gadaleta, Anna Maria Mastrangelo

**09:20 - 9:40 Fiona Doohan** - University College Dublin, Expert working Group Control of Wheat Pathogens and member of the Scientific Board of Wheat Initiative

FHB disease: responses and resistance in bread wheat to the pathogen and its virulence factor deoxynivalenol

**09:40 - 10:00 Brar Gurcham** - The University of British Columbia

Building resistance in wheat against Fusarium head blight (FHB) and deoxynivalenol (DON) accumulation: summary of our work from last 5 years

**10:00 - 10:20 Dilantha Fernando** – University of Manitoba

Resistance to Fusarium head blight of wheat - *is the pathogen one step ahead of us?*

**10:20 - 10:40 Sean Walkowiak** – Grain Research Laboratory, Canadian Grain Commission

Fusarium Head Blight in Canada: Trends, Challenges, and Management

**10:40 - 11:00 Guihua Bai** – USDA-ARS

Wheat resistance to Fusarium head blight and its application in wheat breeding

11:00 - 11:30 Coffee break



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**11:40 - 12:00 Hermann Bürtmayr** – University of Natural Resources and Life Sciences Vienna

Improving Fusarium head blight resistance in durum wheat - moving forward step by step

**12:00 - 12:20 Agata Gadaleta**- University of Bari Aldo Moro

Mapping QTLs and identification of key genes for Fusarium Head Blight Resistance in durum wheat

**12:20 - 12:40 Marco Maccaferri** – Università di Bologna

Scope for selecting low FHB and DON content in durum wheat germplasm

**12:40 - 13:00 Safa Oufensou** – Università degli Studi di Sassari

Environment-friendly approaches to control trichothecene-producing *Fusarium* spp. on durum wheat

13:00 - 15:00 Lunch

**Chairs:** Luigi Cattivelli, Karim Ammar

**15:00 - 15:20 Ljiljana Kuzmanovic** – Università degli Studi della Toscana

*Fhb7E*, a major locus for resistance to Fusarium head blight transferred from the wild *Thinopyrum elongatum* into durum wheat: the metabolomic profile and putative genes underlying the complex host response

**15:20 - 15:40 Salim Bourras** – Swedish University of Agricultural Sciences

Restarting from scratch: dissecting resistance to FHB in cereals at a higher level of organismal complexity

**15:40 - 16:00 Pawan Singh (video)** – CIMMYT

Fusarium head blight research at International Maize and Wheat Improvement Center

**16:00 - 16:20 Xiwen Cai (video)**- USDA-ARS

Characterization and deployment of *Fhb7* in common and durum wheat and barley



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**16:20 - 16:40 Elias Elias** (video)- North Dakota State University

Breeding efforts to develop Fusarium Head Blight resistant durum wheat In North Dakota

16:50 - 17:20 Coffee break

**17:20 - 17:40 Yuefeng Ruan /Samia Berraies (video)** – Agriculture and Agri-Food Canada (AAFC)

Toward building Fusarium head blight resistance through integrated approaches in wheat

**17:40 - 18:00 Jemanesh Haile** - University of Saskatchewan

Comprehensive Assessment of FHB Resistance in Durum Wheat

18:00 - 18:20 Presentation from selected abstracts

**18:00 - 18:10 Walid Hamada** – National Agronomic Institute of Tunisia-

The use of natural products applied by seed coating on wheat to improve tolerance against fusarium

**18:10 - 18:20 Jemal Tola Horo** - EIAR-Ethiopia

Evaluation of Wheat Varieties and Fungicides against FHB in Ethiopia

18:20 - 19:00 General discussion: Is sufficient resistance to Fusarium head blight in durum wheat truly achievable?

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### Wednesday 18th of October 2023

08:45 - 11:00 Discussion of the mentorship programs

**Chairs:** *Luigi Cattivelli*

**8:45 - 9:30 Luigi Cattivelli** - Council for Agricultural Research and Economics (CREA)

Introduction and opportunity of the mentorship program

**9:00 - 9:10 Miheretu Fufa** - Oromia Agricultural Research Institute, Ethiopia

**9:10 - 9:30 Muhsin Ibrahim Avci** - Field Crops Central Research Institute, Turkey

**9:30 - 9:50 Sama Hesnova** - Genetic Resource Institute, Azerbaijan

**9:50 - 10:10 Emna Khanfir** (video) - Biotechnology Center of Sfax, Tunisia

**10:10 - 10:30 Mackaye Moussa Hassane** - National Institute of Agronomic Research, Morocco

11:00 - 11:30 Coffee break

11:30 - 12:30 Update on the durum wheat pangenome

**Chairs:** Jemanesh Haile, Roberto Tuberosa

**11:30 - 11:50 Luigi Cattivelli**

The Platinum Quality durum wheat reference genome of the cultivar Svevo

**11:50 - 12:10 Marco Maccaferri** - Università di Bologna

The tetraploid wheat pan-genome

12:30 - 13.00 Closing remarks



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13:00 - 14:30 Lunch

Parallel sessions

**14:30 - 17:00 Mentors and mentees meetings**

**14:30 - 17:00 Planning the positional paper on resistance to FHB in durum wheat**