



Coordinating global research for wheat

**ANNEX 6 (2014)**

**EXPERT WORKING GROUP ANNUAL REPORT TEMPLATE**

Please return your completed Annual Report to [wheat.initiative@versailles.inra.fr](mailto:wheat.initiative@versailles.inra.fr)

**NAME OF EXPERT WORKING GROUP**

**Durum Wheat Genomics & Breeding (DWGB)**

**LEADERSHIP & AUTHORSHIP**

<b>Chair</b>	Name (Organisation, Country)
<b>Vice-Chair(s)</b>	Name (Organisation, Country), Name (Organisation, Country)
<b>Report Authors</b>	R. Tuberosa (University of Bologna, Italy), L. Cattivelli (CRA, Italy)

**MEETINGS HELD (please attach minutes of these meetings using the template provided)**

<b>Face-to-Face Meetings</b>	<p>26 participants. From 7:45 to 10:00 am, 16 January 2014, at the XXII PAG Congress in San Diego.</p> <p>10 participants. From 18:30 to 20:00 pm, 24 March 2014, at Ciudad Obregon (Mexico).</p>
<b>Other Meetings</b>	<p>8 participants, present, from 10 to 12 am, 10 September, Online Skype Conference to discuss sequencing project.</p> <p>7 participants, present, from 10 to 12 am, 24 September, Online Skype Conference to discuss sequencing project.</p>

**AIMS OF THE EWG**

Synergize the research activities in wheat and identify research priorities in order to enhance the selection progress in durum wheat breeding.

Enhance the level of interactions with the bread wheat community.

Promote the development of molecular tools for the durum wheat community via (i) a new and more accurate consensus map for durum wheat genome and (ii) sequence of the durum genome.

Provide breeders with markers suitable for high-throughput marker-assisted selection.

**(YEAR) ACTIVITY REPORT**

**Objectives identified for 2014**

- Carry out a survey to identify the research priorities for durum wheat genomics.
- Nomination of a Scientific Board, Vice-Chairs and Chair.

- Assembly of an SNP-based consensus map.
- Publication of a Special Issue on Durum Wheat Genomics.
- Organize and start a sequencing project in durum wheat.

#### Progress against aims in 2014

A questionnaire was sent to the members of the EWG-DWGB. The results of the 31 questionnaires that were returned were summarized and discussed during the EWG meeting on 24 March 2014 at the BGRI Congress (Ciudad Obregon, Mexico). This initiative has indicated that genome sequencing, characterization of germplasm and genomics-assisted breeding activities as the most relevant research priorities for the durum wheat community.

An EWG executive committee of 12 members has been nominated and the election for the Chair and three Vice-Chairs of the EWG is underway . The results are expected shortly.

Members of the EWG interacted with colleagues of the bread wheat community in order to assemble the SNP consensus map that was obtained using the 90K Illumina chip assembled by the bread wheat community.

A number of meetings (face-to-face and through Skype) were held to discuss and start a sequencing project in durum wheat.

Markers suitable for marker-assisted selection in breeding programs were identified through the mapping work carried out by a number of members of the EWG.

#### Outputs and deliverables in 2014

Two face-to-face meetings and two teleconferences among members of the EWG.

Summary of the priorities identified through the questionnaire compiled by 31 members of the EWG. The EWG has provided useful details for the writing of the Strategic Research Agenda.

A consensus SNP map was assembled at UNIBO in collaboration with the durum community. The following paper was published: Maccaferri M, Ricci A, Salvi S, Milner SG, Noli E, Martelli PL, Casadio R, Akhunov E, Scalabrin S, Vendramin V, Ammar K, Blanco A, Desiderio F, Distelfeld A, Dubcovsky J, Fahima T, Faris J, Korol A, Massi A, Mastrangelo AM, Morgante M, Pozniak C, N'Diaye A, Xu S, Tuberosa R (2014) A high-density, SNP-based consensus map of tetraploid wheat as a bridge to integrate durum and bread wheat genomics and breeding. *Plant Biotechnol J*. doi: 1111/pbi.12288.

A roadmap for the sequencing of the durum genome has been established and the first activities are now starting to be implemented.

A special Issue on Durum Wheat Genomics and Breeding has been assembled by R. Tuberosa and C. Pozniak. The issue collects 12 manuscripts and will be published as December Issue of *Molecular Breeding*.

#### Contribution to Wheat Initiative objectives (<http://www.wheatinitiative.org/about/objectives>)

This EWG provides an important contribution to the Wheat Initiative aims to reinforce synergies between bread and durum wheat national and international research programmes. In fact, the EWG-DWGB encompasses all the issues related to genomics and breeding in durum wheat and attempts to bridge the information/knowledge available for durum wheat with that available for bread wheat. An example of this is provided by the recent publication of the consensus map (Maccaferri et al. 2014) that provides a valuable genetic bridge between the two species.

<p>The activities of this EWG contribute to strengthen the coordination and encourage the collaboration among research groups working with durum and bread wheat worldwide. A contribution in this direction is the recent launching of a sequencing project of the durum wheat genome that involves a number of colleagues of the EWG.</p> <p>The research activities carried out by the members of the EWG will provide novel genetic resources and knowledge that will ultimately contribute to improve yield and yield stability in wheat, an important objective of the Wheat Initiative.</p>				
<p><b>Links established with other Wheat Initiative activities</b></p>				
<p>So far, no formal link has been established with the other EWG of the Wheat Initiatives. This notwithstanding, bilateral and multilateral contacts/collaborations have been established on a case-by-case basis according to the research needs.</p>				
<p><b>Budget statement for 2014</b></p>				
<p>Expenses</p>				
<b>Type</b>	<b>Budget</b>	<b>Actual</b>	<b>% Spent</b>	<b>Remarks</b>
Organisation of Meetings	40,000 €	0 €	0 %	These funds (2014 budget so far not spent) will be used to support the attendance of EWG members to the workshop planned for 30 May 2015 in Italy.
Consumables	0 €	0 €	%	
Travel and Subsistence	0 €	0 €	%	
Communication	0 €	0 €	%	
Other Costs	0 €	0 €	%	
<b>Total</b>	<b>40,000 €</b>	<b>0 €</b>	<b>0 %</b>	
<p><i>Please attach the Accounts table to this report (Annex 6)</i></p>				
<p><b>External resources and support mobilised</b></p>				
<p>External resources were raised in Italy to start a sequencing project of durum wheat. A direct contribution (Euro 350K) has already been made available by the Italian Research Council (CNR) and by the Agricultural Research Council (CRA; Euro 40K), an in-kind contribution will be provided by the National Agency of Alternative Energies (ENEA; 40K), University of Bologna (Euro 40K) and Institute of Applied Genetics (IGA; 40K). Negotiations are underway with colleagues in Canada (c/o C. Pozniak) and in Turkey (c/o H. Budak) to acquire additional resources for the sequencing project.</p>				
<p><b>Additional activities</b></p>				
<p>A number of EWG members have attended the EWG Jamboree meeting in Paris from 29 to 30 September 2014 contributing to the SRA with the research priorities of the durum wheat.</p> <p>A number of EWG members are engaged in the organization of the international congress "From Wheat to Pasta &amp; Beyond" that will be held in Italy from May 31 to June 3, 2015.</p> <p>A number of EWG members are engaged in their respective nations in lobbying activities to raise funds for research projects on durum wheat genomics and breeding.</p>				

<p><b>ACTION PLAN FOR NEXT TWO YEARS</b></p>	
<p><b>Priorities identified for 2015 and 2016</b></p>	
<p>2015.</p>	<ul style="list-style-type: none"> <li>Organize a technical workshop on genetic resources in durum wheat.</li> </ul>

- Complete a survey on germplasm accessions available for research and breeding purposes.
- Start the sequencing project of the durum wheat genome.
- Seek more formal interactions with other EWG.
- Organize three meetings of the EWG-DWGB: one at PAG, San Diego in January, one at the “From Seed to Pasta & Beyond”, Milan in May and one at the Wheat Congress, Sidney in September.

2016.

- Organize a technical workshop on mapping and cloning approaches in durum wheat.
- Advance the sequencing project of the durum wheat genome.
- Organize two meetings of the EWG-DWGB: one at PAG, San Diego in January and the remaining one in sites to be defined.
- Assembly of introgression libraries using *T. dicoccum* and *T. dicoccoides* as parental lines.

#### Expected outputs and deliverables for 2015 and 2016

2015.

- Workshop (May 30, 2015) on genetic resources in durum wheat and use of genomics approaches to harness useful allelic variation.
- Survey on germplasm accessions.
- Sequence information on the durum wheat genome.
- Organize three meetings of the EWG-DWGB: one at PAG, San Diego in January, one at the “From Seed to Pasta & Beyond”, Milan in May and one at the Wheat Congress, Sidney in September.

2016.

- Workshop on mapping and cloning approaches in durum wheat.
- Sequence information on the durum wheat genome.
- Three meetings of the EWG-DWGB.
- International initiative for the development of backcross families of introgression libraries using *T. dicoccum* and *T. dicoccoides* as donor lines.

#### Timeline of activities for 2015 and 2016

2015.

- May 30: Workshop on genetic resources.
- May 30: Survey on the availability of germplasm accessions.
- May 30: Sequence information on the durum wheat genome.
- January-September: Three meetings of the EWG-DWGB: one at PAG, San Diego in January, one at the “From Seed to Pasta & Beyond”, Milan in May and one at the Wheat Congress, Sidney in September.

2016.

- May: Workshop on mapping and cloning approaches in durum wheat.
- May: Sequence information on the durum wheat genome.
- January-September: Two meetings of the EWG-DWGB.
- December: Backcrossing for the assembly of introgression libraries using *T. dicoccum* and *T. dicoccoides* as donor lines.

#### Additional documents

Results of the questionnaire.

Minutes of the EWG meeting in Obregon.