



International Wheat Genome  
Sequencing Consortium

2018

# ANNUAL REPORT



# OPENING LETTER

Kellye Eversole  
IWGSC Executive Director

In 2018 the IWGSC saw the culmination of 13 years of hard work and the beginning of an exciting new phase.

In July, all resources related to the IWGSC reference sequence (IWGSC RefSeq v1.0) project were released to the community without restriction and, in August, the article describing the analyses of these resources was published in *Science*, along with six companion papers.

The quality of the reference sequence is unprecedented and demonstrated the power of integrating all types of data (whole genome assemblies, HiC, physical maps, and chromosome-based resources) to reach a level of completion and ordering that creates value for all scientists and breeders.

This major milestone would not have been possible without the dedication and commitment of more than 200 scientists around the world who worked relentlessly under the coordination of the IWGSC over the last 13 years.

This could also not have been completed without the support and dedication of the IWGSC sponsors over these years. Some of them, like Kansas Wheat Commission (Kansas Wheat), INRA, and Limagrain, have been supporting the IWGSC from the early years, and we are extremely grateful for their continuous support.

The IWGSC reference sequence has already had a major impact as illustrated by the more than 370 articles referencing or using IWGSC RefSeq and associated resources which were published in 2017 and 2018 alone.



With the completion of IWGSC RefSeq v1.0 and two rounds of annotation, the Consortium has moved into Phase II and now focuses its efforts on four activities:

- (1) IWGSC Diversity project to characterize the breadth of worldwide wheat diversity by de novo sequencing and assembly of at least eight landraces at high quality to obtain ancient wheat haplotypes and sequence multiple landraces and elite varieties at lower quality to capture modern genetic diversity, including alien introgressions;
- (2) IWGSC Gold Standard reference sequence: gap filling and integration of manual and functional annotation to IWGSC RefSeq v1.0;
- (3) IWGSC Exome Array based on the IWGSC RefSeq v1.0; and
- (4) IWGSC Toolbox: continued development of user-friendly, integrated databases and tools to benefit public breeders and industry partners.

With these activities, the IWGSC will reach beyond the reference sequence to provide breeders and the broader scientific community with a full genome-sequence based tool box for wheat improvement.

As was critical over the past 13 years, success will be dependent upon having strong academic and industry leaders, as well as sufficient sponsorship support for the IWGSC to remain operational. Given the importance of functional annotation, we are expanding the breadth of academic leaders on the coordinating committee by adding those with expertise in gene families.



We look forward to working with dedicated leaders and welcome the opportunity of new partnerships as we continue our efforts to functionally characterize the bread wheat genome.



# OUR GOAL

1. Lay a foundation to accelerate wheat improvement
2. Increase profitability throughout the industry

# OUR VISION

Enhance wheat breeding through an increased understanding of the molecular basis of traits and their allelic diversity.

# OUR WORK

We provide resources that serves as a foundation for the accelerated development of improved varieties and that empowers all aspects of basic and applied wheat science.

- Reference sequence
- Assemblies
- Annotations
- Gene models
- Markers
- Physical maps
- BAC libraries
- Tools to browse and mine the data

All data are available at the IWGSC Sequence Repository hosted at URGI

<http://wheat-urgi.versailles.inra.fr/Seq-Repository>



# OUR LEADERSHIP



**Kellye Eversole**

IWGSC Executive Director  
Chair of the Board of  
Directors



**Rudi Appels**

University of Melbourne  
& AgriBio, Australia



**Ute Baumann**

University of Adelaide,  
Australia



**Hikmet Budak**

Montana State University,  
USA



**Etienne Paux**

INRA, France



**Sébastien Praud**

Limagrain, France

The Leadership Team implements the strategic decisions made by the Coordinating Committee, a group comprised of 49 representatives of universities, public research entities and grower organizations, as well as small and large wheat breeding and seed companies.





# 2018 HIGHLIGHTS

## Data release

In 2018, the IWGCS released for use without restriction all resources related to the IWGSC RefSeq v1.0. The resources are freely available at the IWGSC repository at URGI. The data were also incorporated in other international databases such as Ensembl Plants and GrainGenes.

## IWGSC reference sequence publication

On 17 August, the IWGSC published in the journal *Science* the article “Shifting the limits in wheat research and breeding using a fully annotated reference genome” (DOI: 10.1126/science.aar7191) which presents the first high quality annotated reference genome sequence (IWGSC RefSeq v1.0) of the bread wheat variety *Chinese Spring*.



## Coverage of the reference sequence publication

 >100 ARTICLES



## Impact of the IWGSC RefSeq v1.0

Over **270** scientific articles published in 2018 referenced or used IWGSC RefSeq and associated resources.

Of which **197** were related to breeding and field applications.

## URGI sequence repository

The IWGSC sequence repository experienced an increased activity during the year, with respectively 12% and 19% more visits and downloads than in 2017. In the last two years, 755,000 BLAST were performed.



**31,400**  
VISITS



**27,300**  
DOWNLOADS



**476,600**  
BLAST

## IWGSC Membership

The membership increased by 14% in one year.



**2,400**  
MEMBERS



**749**  
INSTITUTIONS



**68**  
COUNTRIES

## IWGSC Website



**40,700**  
VISITS



**23,300**  
USERS



**97,950**  
PAGE VIEWS

## Twitter



**107** tweets, **1450** followers (+58% in one year)  
**1.4%** engagement, **256,000** impressions







# FINANCES

The IWGSC is financially supported by sponsors - private companies, research institutions, and grower organizations.

## Sources of Funding



- Industry (90%)
- Research Institutes and Universities (8%)
- Grower Organizations (2%)

## Expenses 2018



- Contract Services and Professional Fees (92%)
- RefSeq Expenses (3%)
- Operating Expenses (2%)
- Travel (2%)
- Meetings, Workshops, Communication (1%)



# 2018 SPONSORS



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wheat.genome



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I W G S C



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