



The New Wheat Initiative Strategy Coordinating Global Wheat Research

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THE WHEAT INITIATIVE: COORDINATION OF GLOBAL WHEAT RESEARCH



Endorsed, in 2011, by the G20 Agriculture Ministers to address global challenges facing wheat production.

Government agencies in the Wheat Initiative management provide a direct link between the research and policy makers, funders and other investors.

Vision: “Encourage and support the development of a vibrant global wheat public-private research community sharing resources, capabilities, data, knowledge and ideas to improve wheat productivity, quality and sustainable production around the world”.

Mission: “Increase food security, wheat nutritional value and safety while taking into account societal demands for sustainable and resilient agricultural production systems; and maximizing opportunities for gaining added value internationally”.



WHY WHEAT ?



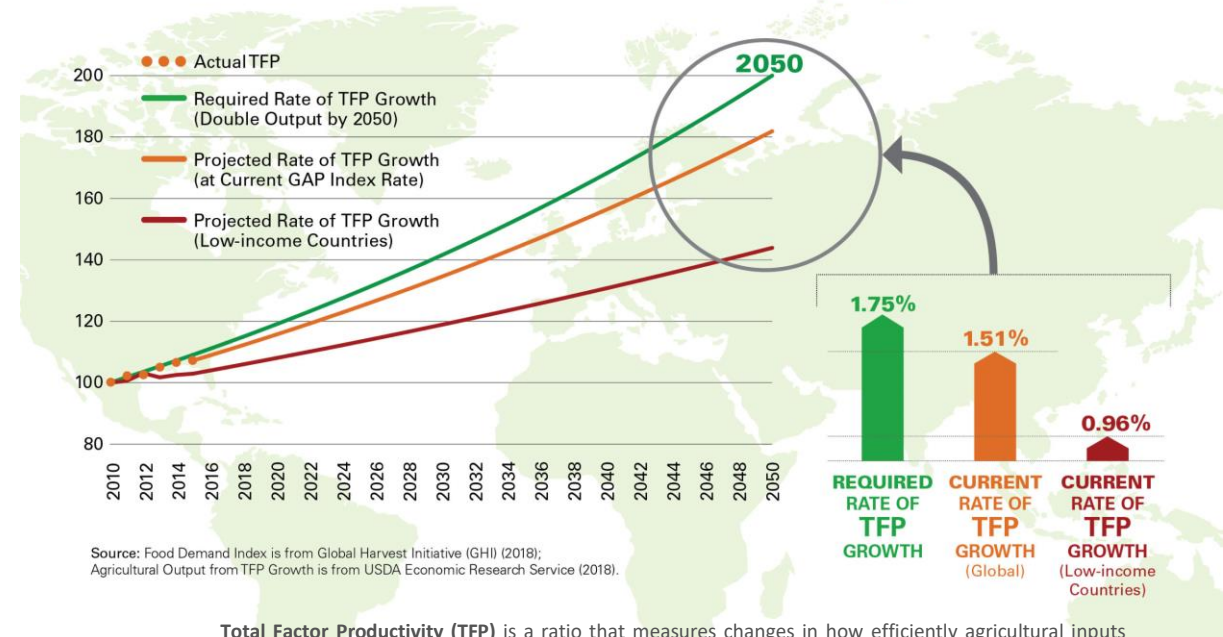
Wheat...

- The world's most important food crop
- 20% of all calories and 20% of all protein in developing and developed countries
- The most traded crop
- Average global yield increase from 1 to 3.5 t/ha since 1960

BUT

- Demand will increase by 60% by 2050, while yields are stagnating
- Wheat is particularly susceptible to climate change
- 7% decline in yield per degree increased temperature

THE GLOBAL AGRICULTURAL PRODUCTIVITY (GAP) INDEX™



Source: Food Demand Index is from Global Harvest Initiative (GHI) (2018);
Agricultural Output from TFP Growth is from USDA Economic Research Service (2018).

Total Factor Productivity (TFP) is a ratio that measures changes in how efficiently agricultural inputs (land, labor, fertilizer, feed, machinery and livestock) are transformed into outputs.

TFP rises when producers use technologies and production practices that result in more output from existing resources.

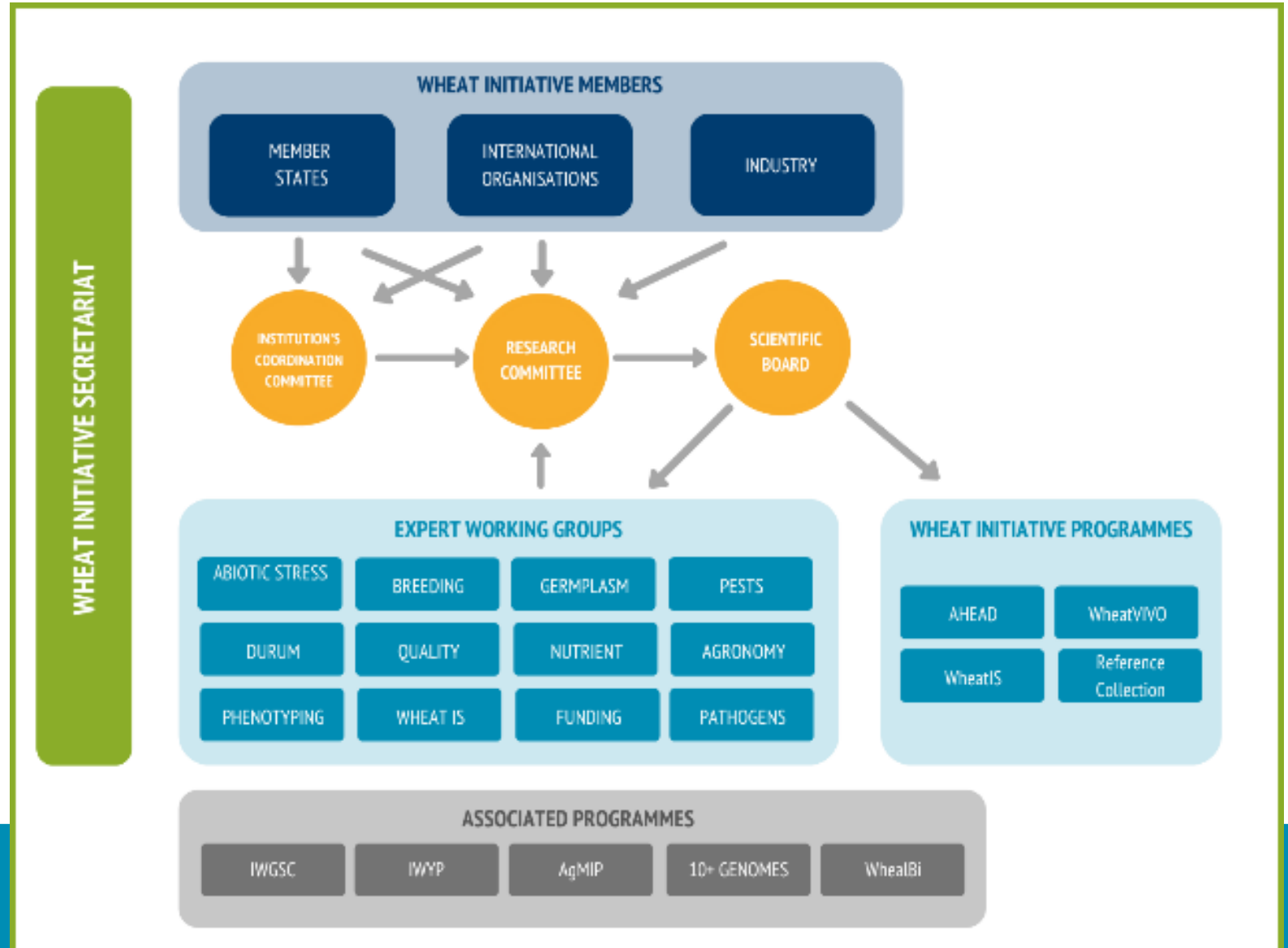
The Global Agricultural Productivity Index: <https://globalagriculturalproductivity.org/data-resources/>

ORGANISATION



Wheat Initiative structure

Wheatinitiative.org



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WheatIS



About

Help desk: If you have questions regarding this Wheat Information System project, please contact: wheatis-contact@wheatis.org

This project aims at building an International Wheat Information System, called hereafter WheatIS, to support the wheat research community. The main objective is to provide a single-access web base system to access to the available data resources and bioinformatics tools.

This project is based on the principles listed below:

- Collective building of the WheatIS to better respond to the needs of the international wheat community;
- Incremental implementation to offer rapidly an operational information system;
- Emphasis on Quality Assurance to serve as a framework for an approach with incremental implementation;
- Promotion of an open-access

Tweets from @

WheatIS Retw
Wheat Initial
We have organisation, RT..the full dc
@CropTrust @
#wheat #foo
wheatinitiativ

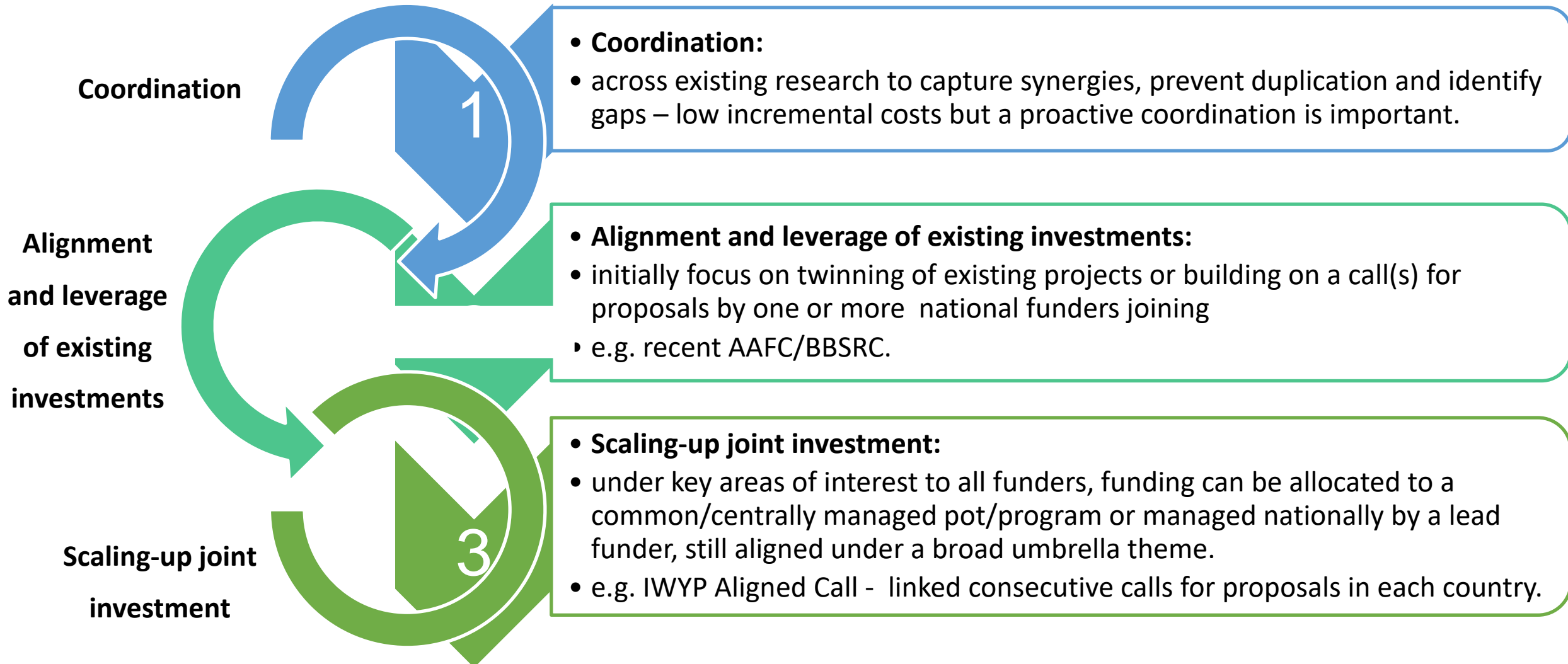


WheatVIVO



The screenshot shows the WheatVIVO website interface. At the top is a navigation menu with links: Home, People, Organisations, Projects, Publications/Resources, Join, Data Protection, Contact Us, FAQ, and What's New. Below the menu is a 'Welcome to WheatVIVO' section. On the left, a text box states: 'This site is still under development. We value your input and suggestions: if you find any problems, incorrect information or have some suggestions to improve the site, please let us know on wheatvivo@julius-kuehn.de. Thank you for your co-operation.' Below this is a paragraph describing the portal's purpose: 'WheatVIVO is an open access web portal providing information about wheat researchers and projects globally across the public-private wheat community: who is doing what, where and with whom. WheatVIVO is a useful tool to help researchers find partners and develop collaborations, for students and post-docs to identify labs in which they would like to work, and for policy makers and funding agencies to better understand the research priorities in different countries.' Below that, it says: 'Browse or search information on researchers, labs, grants, projects and publications.' On the right, a map of the world is displayed with the title '5386 researchers or organizations with known locations in 72 countries and regions.' The map uses colored circles to represent locations, with a legend indicating 'Countries' (yellow) and 'Regions' (blue). A small text at the bottom right of the map reads 'Powered by joshua - mapbox.com'.

3-STAGE APPROACH TO SUSTAIN LONG-TERM INTERNATIONAL FUNDING



WHAT ELSE?



RESEARCH AND TECHNOLOGY DELIVERY CAPABILITIES

- Boost research and technology delivery capabilities by investing in staff and student training.
- Support the exchange of personnel between research organizations and build research infrastructure.
- Provide financial and organizational support from national agencies to research groups seeking participation in international partnerships.

SUPPORT INTERNATIONAL ACTIVITIES

- Support international activities to facilitate exchange of resources, particularly germplasm, and the evaluation and delivery of research outcomes.
- Efficient evaluation and delivery of technologies from diverse sources through the germplasm evaluation and distribution capabilities, or hubs. Examples of CIMMYT, ICARDA and the International Wheat Yield Partnership (IWYP).

FLEXIBLE AND SCIENCE-BASED REGULATOR FRAMEWORKS

- Regulatory frameworks that take notice of new scientific data and experience in deploying new technologies.
- Internationally consistent regulation.
- Regulation based on sound science and addressing real safety risks.
- Recognise the long safe use of diverse technologies for crop improvement.

STRATEGIC RESEARCH AGENDA

The **Strategic Research Agenda** published in **2015**:

- Expected major changes in technologies and resources;
- Short (1-5 years), medium (5-10 years) and long (>10 years) term objectives;

Game Changers	Status	Next steps
A fully assembled and aligned wheat genome sequence	Complete and pan genome also developed	Transcript databases and germplasm collection sequenced
Wheat data availability via an open information exchange framework	WheatIS developed	Expand databases linked to WheatIS and increase functionality
The ability to build new combinations of alleles	On-going	Improve access to germplasm with complex allele combinations

The **Strategic Research Agenda** published in **2022**:

- Review and recalibrate the progress made on the 2015 objectives;
- Establish new objectives that consider Wheat RefSeq, gene editing, climate change, production challenges, technology shifts, political conflicts, etc. ;

STRATEGIC RESEARCH AGENDA



<https://www.wheatinitiative.org/2022-strategic-research-agenda>

Creation:

- Virtual workshops (Jan-Feb)
- Report writing & editing (March-June)
- Launch (July) and Publication (July & October)

Content:

- Highlights current global wheat research challenges
- Enunciates potential scientific solutions
- Vision for the future

Goal:

- To target the Wheat initiative's mission to increase food security, wheat nutritional value and safety while taking into account societal demands for sustainable and resilient agricultural production systems.

For you:

- Document you can cite in your grant proposals, publications, government lobbying effort, discussion with policy makers, etc.



Review

Meeting the Challenges Facing Wheat Production: The Strategic Research Agenda of the Global Wheat Initiative

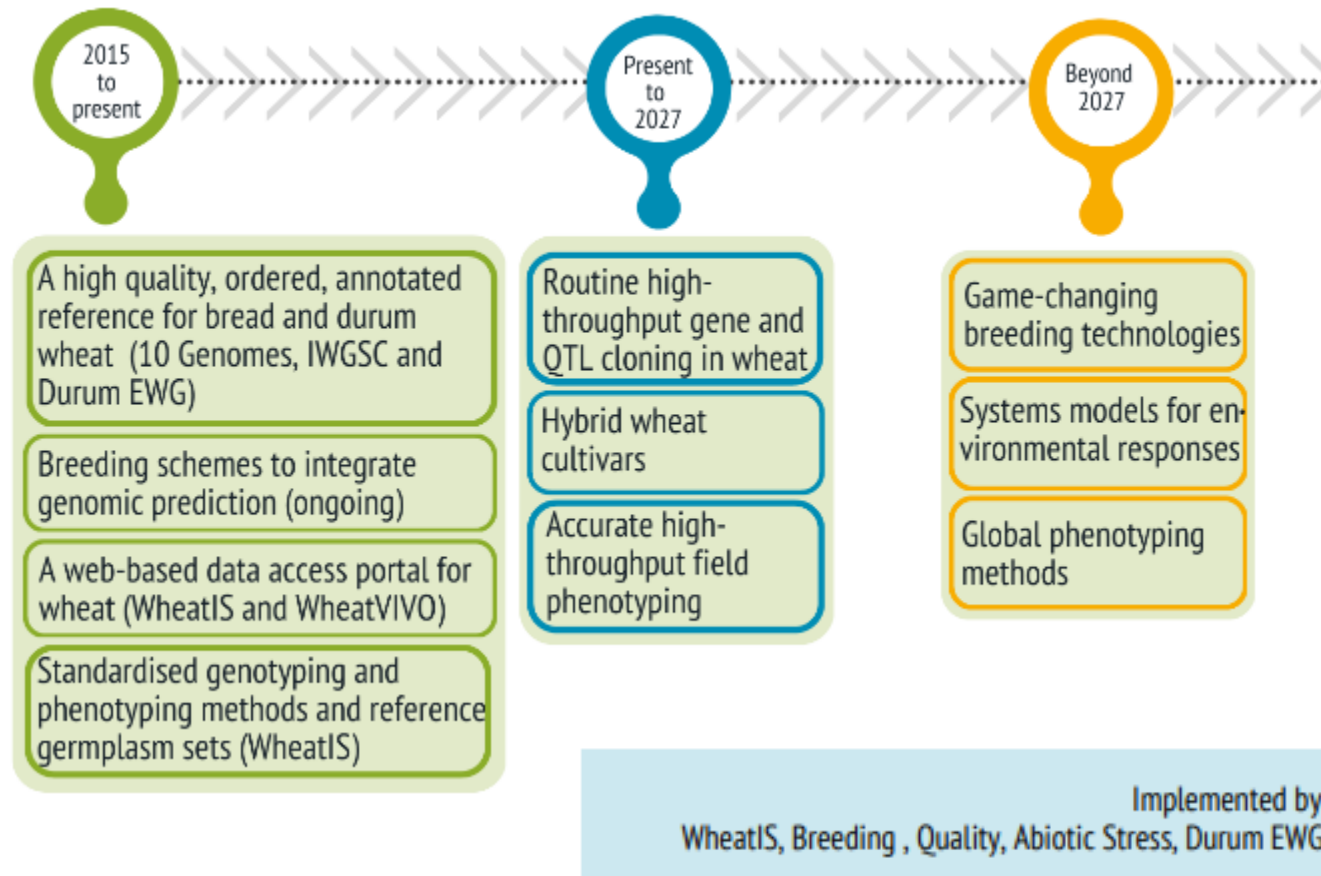
Peter Langridge ^{1,2,*}, Michael Alaux ³, Nuno Felipe Almeida ⁴, Karim Ammar ⁵, Michael Baum ⁶, Faouzi Bekkaoui ⁷, Alison R. Bentley ⁸, Brian L. Beres ⁹, Bettina Berger ⁹, Hans-Joachim Braun ⁵, Gina Brown-Guedira ¹⁰, Christopher James Burt ¹¹, Mario Jose Caccamo ¹², Luigi Cattivelli ¹³, Gilles Charmet ¹⁴, Peter Civián ¹⁴, Sylvie Cloutier ¹⁵, Jean-Pierre Cohan ¹⁶, Pierre J. Devaux ¹⁷, Fiona M. Doohan ¹⁸, M. Fernanda Dreccer ¹⁹, Moha Ferrahi ⁷, Silvia E. Germán ²⁰, Stephen B. Goodwin ²¹, Simon Griffiths ²², Carlos Guzmán ²³, Hirokazu Handa ²⁴, Malcolm John Hawkesford ²⁵, Zhonghu He ²⁶, Eric Huttner ²⁷, Tatsuya M. Ikeda ²⁸, Benjamin Kilian ²⁹, Ian Philip King ³⁰, Julie King ³⁰, John A. Kirkegaard ³¹, Jacob Lage ³², Jacques Le Gouis ¹⁴, Suchismita Mondal ³³, Ewen Mullins ³⁴, Frank Ordon ³⁵, Jose Ivan Ortiz-Monasterio ⁵, Hakan Özkan ³⁶, İrfan Öztürk ³⁷, Silvia A. Pereyra ²⁰, Curtis J. Pozniak ³⁸, Hadi Quesneville ³, Martin C. Quince ²⁰, Greg John Rebetzke ³¹, Jochen Christoph Reif ³⁰

Agronomy **2022**, *12*, 2767. <https://doi.org/10.3390/Agronomy12112767>

SRA 2022: SRA 2015 PROGRESS REPORT



Objective 4: Enabling technologies and the sharing of resources



Major issues and challenges facing wheat production and research

- Inconsistencies in regulatory environment
- Access to staff with skills in new and old technologies
- Data access and standards
- Support for multinational research

Research Priorities

- Strengthen existing research activities
- Enhance agronomy in its broadest definition
- Increase genetic diversity
- Understanding root and soil biology

Wheat Initiative structure and organization

- Develop educational and training programs
- The Wheat Initiative as an advocacy and lobby organization
- Expand engagement
- Supporting multinational research

- Wheat Initiative Expert Working Groups and research alliances that bring together capabilities and resources targeted to global research challenges.
- Early Career Researcher Program
- Current alliances:
 - IWGSC** and **10X Genomes** – International Wheat Genome Sequencing Consortium (genomics resources)
 - IWYP** – The International Wheat Yield Partnership (boosting wheat yield potential)
 - AHEAD** – Alliance for Wheat Adaptation to Heat and Drought (producing heat and drought tolerant germplasm)
 - WATCH-A** – Wheat Initiative Crop Health Alliance (diagnosis and monitoring of wheat diseases).



Find out more
Wheatinitiative.org

Follow us on Twitter
[@WheatInitiative](https://twitter.com/WheatInitiative)



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