**Working group “Wheat data interoperability”**

Scope

* **International context :**

**Wheat intiative:** [www.wheatinitiative.org](http://www.wheatinitiative.org) The Wheat Initiative aims to reinforce synergies between bread and durum wheat national and international research programmes to increase food security, nutritional value and safety while taking into account societal demands for sustainable and resilient agricultural production systems.

Main goals :

* + coordinate worldwide research efforts in the fields of wheat genetics, genomics, physiology, breeding and agronomy.
  + provide a forum to facilitate communication between research groups and organisations worldwide.
  + foster communication between the research community, funders and global policy makers at the international level to meet their research and development goals.
  + facilitate and ensure the rapid exchange of information and know-how among researchers, and support knowledge transfer to breeders and farmers

**G8+5 open data for agriculture**: At the 2012 G-8 Summit, G-8 leaders committed to the New Alliance for Food Security and Nutrition, the next phase of a shared commitment to achieving global food security.

As part of this commitment, they agreed to “share relevant agricultural data available from G-8 countries with African partners and convene an international conference on Open Data for Agriculture, to develop options for the establishment of a global platform to make reliable agricultural and related information available to African farmers, researchers and policymakers, taking into account existing agricultural data systems.”

* **Charter**: Interoperability is a wide concept that encompasses the ability of organisations to work together towards mutually beneficial and commonly agreed goals. The Working group is using the following definition from the EIF: *‘An interoperability framework is an agreed approach to interoperability for organisations that wish to work together towards the joint delivery of public services. Within its scope of applicability, it specifies a set of common elements such as vocabulary, concepts, principles, policies, guidelines, recommendations, standards, specifications and practices.’*

The working group aims to provide a common framework for describing, representing linking and publishing Wheat data with respect to open standards. Such a framework will promote and sustain Wheat data sharing, reusability and operability. Specifying the Wheat linked data framework will come with many questions: which (minimal) metadata to describe which type of data? Which vocabularies/ontologies/formats? Which good practices?

Mainly based on the the needs of the Wheat initiatiative Information System (WheatIS) in terms of functionalities and data types, the working group will identify relevant use cases in order to produce a “cookbook” on how to produce “wheat data” that are easily shareable, reusable and interoperable.To do so, the working group will :

* + Run a survey of existing standards and recommendations (vocabularies, ontologies, formats): this survey will identify which standards are adopted in the Wheat data managers community, which ones are missing and which ones can stand as references.
  + Coordinate data exchanges : identify the main Wheat data types, end-user categories, case studies and provide standards harmonization, guidelines to describe, document, structure and interlink data taking into account the diversity of data types.
  + Evaluate the interest of linked data technologies to improve usage and access to the information.
  + Identify relevant platforms to support the Wheat linked data framework.

Based on a survey report[[1]](#footnote-0) performed in June 2012, the Working group will focus on the following data types, by order of priority: SNP, Genomic annotations, Phenotypes, Genetic Maps, Physical Maps, Germplasm.

Implementing the framework will help cultivate a Wheat ecosystem with people familiar with interoperability, organisations ready to collaborate, and common tools and services.

Value proposition

## Individuals, communities, and initiatives that will benefit from the Wheat Data Interoperability Guidelines

The WheatIS will be provided with a linked data framework based on community-accepted standards, which ensure data analysis and data integration facilities. Such a framework is a great asset for the WheatIS to provide the analysis functions and other services expected by the researchers.

* + The Wheat data managers and data scientists will have a common and global framework to describe, document, and structure their data.
  + Researchers, growers, breeders, and other data users will have seamless access, use, and reuse to a wide range of Wheat data. Data linking will also ease emergence of new data analyses and knowledge discovery methodologies.
  + Other plants data managers and scientists – will have the benefit of a reusable data framework.
  + Researchers working on other plants will be able to more easily access, reuse and link up Wheat data with their own data.

The “cookbook” might be adapted for other crops such as RICE, MAIZE which are also very important for food security

## Key impacts of the RDA Wheat Data Interoperability Guidelines

* + Promote adoption of common standards, vocabularies and best practices for Wheat data management
  + Facilitate access, discovery and reuse of Wheat data
  + Facilitate Wheat data integration

Engagement with existing work in the area

The Wheat data interoperability WG is a working group of the RDA Agricultural data interest group.

The working group will take advantage of other RDA’s working group’s production. In particular, the working group will be watchful of working groups concerned with metadata, data harmonization and data publishing.

The working group will also interact with the WheatIS experts and other plant projects such as TransPLANT (<http://urgi.versailles.inra.fr/Projects/TransPLANT>), agINFRA (<http://www.aginfra.eu>) which are built on standard technologies for data exchange and representation.

The Wheat data interoperability group will exploit existing collaboration mechanisms like CIARD (<http://www.ciard.net>) to get as much as possible stakeholder involvement in the work.

Work plan

* **Form and description of final deliverables**
  + A report on the survey of existing standards
  + A Wheat linked data framework specification (cookbook)
  + Library of vocabularies/ontologies
  + Decision tree for describing/representing data based on
    - data and metadata description recommendations
    - file formats recommendations
* **Months/Deliverables/Milestones**
  + **Month 1 to 6**: Survey of existing standards and recommendations (vocabularies, ontologies, formats). Plus identification of end-user categories and relevant platforms.
  + **Month 6 to 10**: First version of the Wheat linked data framework specification (cookbook)
  + **Month 7 to 9**: Identification of end-user categories and relevant platforms
  + **Month 10 to 15**: Evaluation of the Wheat linked data framework (WheatIS)
  + **Month 16 to 18**: Final version of the Wheat linked data framework specification (cookbook v1)
  + **Month 10 to 18**: Promotion.
  + **Milestone 1:** First version of the Wheat linked data framework specification
  + **Milestone 2:** Final version of the Wheat linked data framework specification

Adoption plan

The working group can rely on its initial members to promote a large adoption of the data framework. Indeed:

* INRA is a leading partner of the Wheat initiative and an active member of the working group. One of the Wheat initiative objectives is to build an international and integrated Wheat information system (WheatIS) intended to an international Wheat community (researchers, growers, breeders, etc.). The WheatIS could operate as a hub and integrate wheat data produced by the community. The working group will base a large part of its specification requirements on the Wheat initiative’s data exchange needs, and the WheatIS experts will be part of the working group stakeholders. The Wheat linked data framework will be tested first through the WheatIS. The working group can rely both on the Wheat initiative members (public research organizations and private companies) and its community to ensure a large circulation of the Wheat linked data framework and facilitate its adoption.
* Achieving food security for all is at the heart of FAO's efforts – to make sure people have regular access to enough high-quality food to lead active, healthy lives. FAO’s mandate is to improve nutrition, increase agricultural productivity, raise the standard of living in rural populations and contribute to global economic growth. One of FAO’s principal means to achieve this goal is collecting, disseminating and brokering knowledge. Therefore FAO has a prime interest on excellent information systems. The “AIMS team” (Agricultural Information Management Standards) in FAO is engaged in helping to set standards and methodologies for easier sharing and exchange of Agricultural information
* CIMMYT

Initial membership

* Johannes KEIZER, **FAO**
* Devika MADALLI, ISI
* Odile HOLOGNE, **INRA**
* Esther DZALE YEUMO KABORE, **INRA**
* Nikos MANOUSELIS, **Agro-Know Technologies**
* Michael Alaux, **INRA**
* Cyril Pommier, **INRA**
* Sophie Aubin, **INRA**
* Richard Fulss **(CIMMYT)**
* Helmuth Knuepffer **(Genbankdokumentation Gatersleben)**
* wheat initiatives partners (<http://www.wheatinitiative.org/about/members>)

● **Achieving consensus, addressing conflicts, and staying on task and within scope**

○ Consensus will be reached via open discussion, voting, and majority considerations informed by evidence where possible.

○ Conflict will first be addressed by WG leaders. An escalation procedure will be drafted, for example the RDA Council will be consulted, and an independent person not in the WG will be brought in to mediate the conflict.

○ Staying on task and within scope: we have considerable experience in projects and standards development. The key mechanism for reaching consensus will be through examining evidence and identifying limitations of applicability of competing ideas. In addition, of course, we will agree on a detailed schedule and track action items.

● **Operation parameters**

The work is voluntary, and not every WG member will be able to contribute equally therefore we will aim to fit the work to focus efforts on members’ specific interests but also to ensure that all members can contribute to internal reviews. The WG hold internal assessments every 6 months to ensure we are on track.

● **WG Assessment**

The 6 monthly assessments will involve work group members and also external reviewers who have expertise in this area, including those who declined membership of the working group because of pressure of other work.

● **Broader community engagement and participation**

**References**

Wheat initiative Information System:

<http://www.wheatinitiative.org/research/wis>

<http://www.wheatinitiative.org/sites/default/files/docs/wheat-info-system-report.pdf>

GARNet report - Making data accessible to all:

<http://www.garnetcommunity.org.uk/sites/default/files/Making%20Data%20Accessibile%20to%20All%20Report%202012.pdf>

[**Various relevant refs:**](http://www.garnetcommunity.org.uk/sites/default/files/Making%20Data%20Accessibile%20to%20All%20Report%202012.pdf)

[http://www.wheatbp.net](http://www.wheatbp.net/)

<http://wheat.pw.usda.gov>

1. <http://www.wheatinitiative.org/sites/default/files/docs/wheat-info-system-report.pdf> [↑](#footnote-ref-0)