# Introduction

Wheat is a major source of calories and protein, especially for consumers in developing countries[[1]](#footnote-1) and thus plays an important socio-economical role in the today’s world. The growing number of numerical techniques offers unique opportunities to researchers to discover, access, and reuse data outside the original context in which these data are collected, in order to enable new analysis and discoveries. However, the disparate nature of the formats and vocabularies used to represent and describe the data has resulted in a lack of interoperability.

The Wheat Data Interoperability working group has been created within the frame of the Research Data Alliance (<https://rd-alliance.org>) and under the umbrella of the International Wheat Initiative (<http://www.wheatinitiative.org/>), in order to provide a common framework for describing, and representing wheat data with respect to existing open standards. While interoperability is a wide concept this paper will use the following definition from the European Interoperability Framework[[2]](#footnote-2): ‘An interoperability framework is an agreed approach to interoperability for organizations 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 framework proposed by the working group consists in guidelines and tools which aim to promote the adoption of common standards, vocabularies and best practices for wheat data management. It focuses on 6 data types (sequence variations, genome annotations, phenotypes, physical maps, germplasm and gene expression), based on a survey report[[3]](#footnote-3) performed in June 2012 by the International Wheat Initiative.

The rest of the paper is organized as follows: section 2 presents the current state of practices in wheat data management. The recommendations are described in section 3. Benefits, possible future developments and concluding remarks are presented in section 4

# Wheat data management: current state of practices

## Wheat related data formats and metadata standards: landscape and current state of practices

## The inventory of wheat related vocabularies

## Identifying wheat data interoperability use cases

## Criteria of the recommendations

# The wheat data interoperability guidelines

## The wheat data exchange formats guidelines

## The wheat data description and annotation guidelines

## The wheat related vocabularies repository

# Benefits and future direction

1. Impacts of international wheat improvement research, 1994-2014. 2016. Lantican, M.A.; Braun, H.J.; Payne, T.S.; Singh, R.P.; Sonder, K.; Baum, M.; Van Ginkel, M.; Erenstein, O.. : 59 p.. Mexico, DF (Mexico). CIMMYT. [↑](#footnote-ref-1)
2. <http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf> [↑](#footnote-ref-2)
3. <http://ist.blogs.inra.fr/wdi/wp-content/uploads/sites/8/2015/06/wheat-info-system-report.pdf> [↑](#footnote-ref-3)