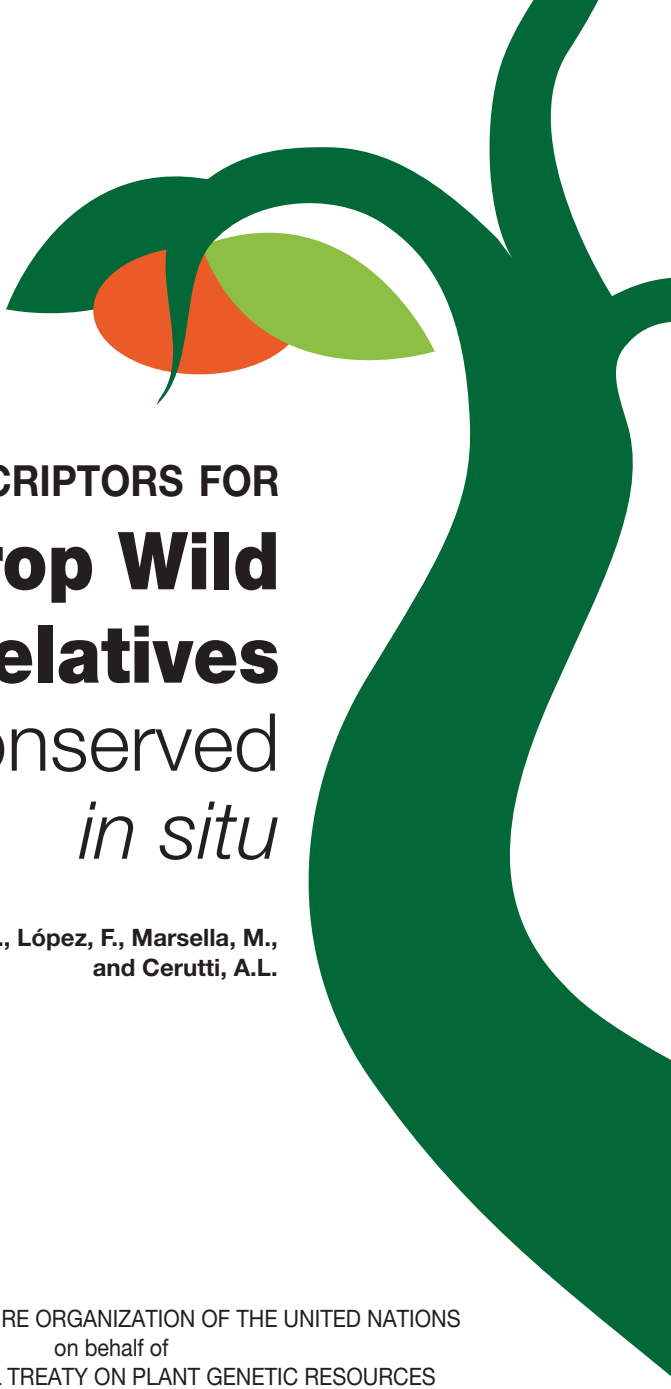
Food and Agriculture Organization of the United Nations

The International Treaty ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

DESCRIPTORS FOR

Crop Wild Relatives

conserved *in situ*



DESCRIPTORS FOR
Crop Wild Relatives
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Alercia, A., López, F., Marsella, M., and Cerutti, A.L.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
on behalf of
THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE
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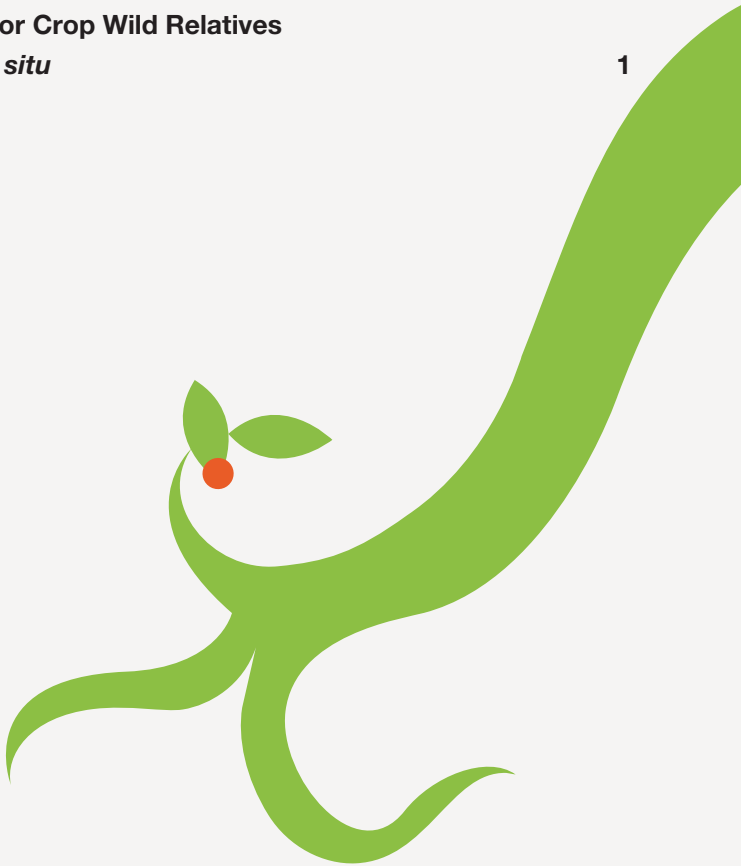

FOREWORD

One of the main factors adversely affecting the conservation, use, monitoring and reporting of information on Plant Genetic Resources for Food and Agriculture (PGRFA) is the lack of access to data and inefficient exchange of information. This is, in large part, due to the different approaches to data management and documentation, which have prevented the creation of a unique language to share data despite the many attempts, so far, to do so.

This lack of standardization had prevented the PGRFA community from exchanging PGRFA data worldwide and had, for years, been one of the main challenges for the effective conservation and sustainable use of plant material. These gaps represent a barrier to the sharing of information in the scientific community and to the development of value-added services for plant breeders, researchers and organizations working on agricultural biodiversity. If crop wild relatives (CWR) *in situ* resources are to be conserved and sustainably used, it is fundamental to bring their information into an accessible standardized format to secure a consistent data compilation and management.

To meet these challenges, the Secretariat of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) undertook to address the gaps and the lack of coherence in the documentation methods for plant resources, in particular for Crop Wild Relatives (CWR) conserved under *in situ* conditions, through the development of an international standard. It has developed an international language for CWR *in situ* data that will enable countries to compile and exchange data held by different national and international organizations, advanced research institutes and other bodies. Compilation and data exchange for on-farm managed cultivated PGRFA is not addressed in this document.

This technical paper is an additional tool by which the Secretariat seeks to strengthen capacities of Contracting Parties and National Programmes on the implementation of the International Treaty. The List of Descriptors will help users to understand how CWR *in situ* information can be documented and integrated in their institutional workflow, including what data need to be provided and how to do it.

The accomplishment of this undertaking was possible thanks to the work of experts, technical staff and national focal points of the Treaty involved in the consultations and related discussions over this year. Special thanks to the support of the members of the Core Advisory Group who provided scientific guidance to the development process of this List of Descriptors. The financial support provided by the Government of Germany,

which made it possible for us to undertake this project is acknowledged and highly appreciated.

We hope that this material meets the needs of researchers and users of CWR material and the broader plant genetic resources community, and that it will also contribute to the way plant genetic resources for food and agriculture are documented and exchanged at the global level.

Kent Nnadozie
Secretary

International Treaty on Plant Genetic Resources
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Food and Agriculture Organization of the United Nations (FAO)

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This technical paper has been developed and published thanks to the project *"Development of a globally agreed list of descriptors for* in situ *Crop Wild Relatives Documentation"*, funded by the Federal Ministry of Food and Agriculture of Germany.

The Secretariat of the International Treaty of FAO acknowledges all the institutions and individuals who have contributed to the accomplishment of this work.

Our very special thanks go to the experts who participated in the various consultations, round tables and training workshops for their valuable inputs and suggestions.

This publication also benefited from the valuable review by members of the Core Advisory Group of the project, specially selected for the validation of the survey results whose names are listed under the *List of Contributors* below. They are acknowledged for their significant support, guidance and advice.

Finally, we thank all the national focal points of the International Treaty and individuals who provided important inputs in the consultation process and for the improvement of this publication.

We are grateful to the colleagues of the Treaty Secretariat and other technical staff of FAO for their contribution to the development of this document. Thanks to Adriana Alercia, Francisco López, Marco Marsella, Ana Laura Cerutti and Gerardo Francione for their direct inputs and active coordination of the project.

Kent Nnadozie, Secretary of the International Treaty, held the overall responsibility for this publication.

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DESCRIPTORS FOR CROP WILD RELATIVES CONSERVED *IN SITU* (CWRI *v.1.1*)

29 April 2022

This list of passport *Descriptors for Crop Wild Relatives conserved* in situ *(*CWRI *v.1.1)* is an update of the earlier version published by the Secretariat of FAO's International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in February 2021 in the context of the development of its Global Information System (GLIS). The first version was developed taking the *Core Descriptors for* in situ *conservation of CWR v.1* published by Bioversity International in 2013 as the starting point. It also builds on recent experiences conducted by the Secretariat, as well as on the inputs of international projects such as the Farmer's Pride.

The CWRI passport descriptors proposed here constitute the minimum initial list for CWR *in situ* data exchange. They are the result of consultations conducted with the support of the national focal points of the International Treaty and selected international partners and experts, as reported in the 'Contributors' section. A global survey was conducted in early 2020 and the inputs of more than 107 experts from 87 institutions in 48 countries were analysed and taken into consideration. We are also thankful to all the scientists that have served in the Core Advisory Group (12 members) for their valuable support in setting the direction of the research and taking a prominent role in the validation of the results.

The list is intended to be a user-friendly data exchange tool for which data should be available worldwide. Its wide adoption and use will facilitate and streamline the collection of data needed for documenting *in situ* CWR in a consistent way.

For each descriptor, this tool provides a brief explanation of content, its coding scheme, and a suggested field name. Nevertheless, on-farm management of plant material is not addressed in this document. It is to be noted that suggested mandatory descriptors are highlighted.

The standard descriptor list for CWR *in situ* documentation developed and validated at the global level through this project is an evolving document. The future modification or addition of further descriptors should not be precluded when more data would become available. These CWRI descriptors are designed to facilitate the compilation and exchange of CWR in situ passport data. They are also designed to contribute to the further development of the Global Information System (GLIS) and support the conservation and utilization of CWR throughout the world. Furthermore, they aim to be compatible with the "*Digital Object Identifiers for food crops - Descriptors and guidelines of the Global Information System*" (Alercia *et a*l. 2018).

The Secretariat of the International Treaty appreciates the additional inputs received since February 2021 as well as the comments resulting from the desk studies carried out that have allowed a slight update of these descriptors and welcomes any further suggestions for the improvement of this revised version (*v.1.1*) of Descriptors for *in situ* conservation of CWR that can be sent to the Secretary of the International Treaty pgrfa-Treaty@fao.org. The Secretariat will make available guidelines for the optimal use of the descriptors.

LIST OF CWR DESCRIPTORS

* Descriptors numbers belonging to the list published in 2013 are included in parentheses (x.x.x) next to the descriptor's name.

Mandatory Descriptors

These descriptors are essential to uniquely identify the material. Values for them must be provided for every CWR population. Users are not given the option to enter "unknown", "not applicable" or "other", or to leave the field empty.

1. **Genus** (1.1.1) (GENUS)
Genus name for taxon.

2. **Species** (1.1.2) (SPECIES)
Specific epithet portion of the scientific name. If unknown, 'sp.' is allowed.

3. **Country of occurrence** (2.1.1) (ORIGCTY)
Country where the CWR population was observed or inventoried. Use the Three-letter ISO 3166-1 code of the country where the site is located.

4. **Observation date** [YYYY-MM-DD] (3.1.1) (OBSDATE)
The most recent date the population was observed. Accepted format is ISO 8601, where YYYY is the year, MM is the month and DD is the day (e.g. 1994-12-15, or 1994-12, or 1994).

5. **Population identifier** (3.1.2) (POPID)
The identifier (sequential number or code) that you use to identify the population. Each distinct population should be given a unique population identifier.[1]

6. **Managing institute, legal entity or individual name** (MNGINSTNAME)
Name of the managing institute, legal entity, herbarium, or individual holding rights or responsible of the population (e.g., protected area authority, nature reserve manager, national park manager, private landowner, etc.).

   6.1 **Managing institute, legal entity, or individual address** (MNGINSTADDRESS)

[1] For those populations without a Population identifier, GLIS will generate a POPID and will assign it to the material when registering the DOI (i.e. "UK 001").

Highly recommended Descriptors

These descriptors may not be always available. Valid values must be entered if known, but missing values are allowed.

7. **Species authority** (1.1.3) (SPAUTHOR)
Provide the authority for the species name. It is recommended to use the Catalogue of life.

8. **Subtaxon** (1.1.4) (SUBTAXA)
Subtaxon can be used to store any additional infraspecific epithet. The following abbreviations are allowed: 'subsp.' (for subspecies); 'var.' (for botanical variety); 'f.' (for form). It is recommended to use the Catalogue of life.

9. **Subtaxon authority** (1.1.5) (SUBTAUTH)
Subtaxon authority at the most detailed taxonomic level.

10. **Location of occurrence site** (2.1.2) (OCCURSITE)
Location information below the country level that describes the site where the population sample was observed or inventoried. This might include the distance in km and direction from the nearest place, town, village, or map grid reference point, (e.g., "7 km south of Curitiba in the state of Parana").

11. **Latitude of occurrence site** (Decimal degrees) (2.1.3.1) (DECLATITUDE)
Latitude of the site expressed in decimal degrees. Positive values are North of the Equator; negative values are South of the Equator (e.g., -44.6975).

12. **Longitude of occurrence site** (Decimal degrees) (2.1.3.2) (DECLONGITUDE)
Longitude of the site expressed in decimal degrees. Positive values are East of the Greenwich Meridian; negative values are West of the Greenwich Meridian (e.g., -120.9123).

13. **Coordinate datum** (2.1.3.4) (COORDDATUM)
The geodetic datum or spatial reference system in which the coordinates given in decimal latitude and decimal longitude are based (e.g., WGS84, ETRS89, NAD83).

14. **Elevation of site** [masl] (2.1.4) (ELEVATION)
Elevation of site expressed in meters above sea level. Negative values are allowed.

15. **Site protection** (2.4) (SITEPROT)

Indicate whether the site is under any legal or official legislation. Follow IUCN Guidelines available at https://www.iucn.org/theme/protected-areas/about/protected-area-categories

0 Not protected by legislation
1 Strict nature reserve
2 Wilderness area
3 National park
4 Natural monument or feature
5 Habitat/species management area
6 Protected landscape or seascape
7 Protected area with sustainable use of natural resources
8 Other effective conservation measures (OECM)[2]

16. **Status of occurrence site** (3.2.4) (POPSRC)

Status of the occurrence site of the population.

10 **Wild** (11 Forest or woodland, 12 Shrubland, 13 Grassland, 14 Desert or tundra, 15 Aquatic habitat)

20 **Farm or cultivated area** (21 Field, 22 Orchard, 23 Backyard, kitchen or home garden, 24 Fallow land, 25 Pasture, 28 Park)

60 **Weedy, disturbed or ruderal habitat** (61 Roadside, 62 Field margin)

99 **Other** (for example coastal habitats, elaborate in REMARKS field)

17. **Biological status of the population** (SAMPSTAT)

The coding scheme proposed can be used at different levels of detail, either by using the general codes (in **boldface**), such as 100 or 200, or by using the more specific codes such as 110, 120 or 130.

100 **Wild**
- 110 Natural
- 120 Semi-natural/wild
- 130 Semi-natural/sown

200 **Weedy**

999 **Other** (elaborate in REMARKS field)

[2] OECM are areas outside protected areas that deliver the effective and long-term *in situ* conservation of biodiversity. See https://www.iucn.org/sites/dev/files/iucn_wcpa_technical_note_series_no._6.pdf.

18. **Name of the institute or individual holding *ex situ* samples** (INSTNAME)
Name of the institute, legal entity, herbarium, or individual where collected population samples are held (e.g., local or national genebank, herbarium or landowner). If the Managing institute holds the material, the holding institute name should be the same as the Managing institute.

18.1 **Address of the holding organization or individual** (INSTADDRESS)

19. **Code of the institute or herbarium holding *ex situ* samples** (3.2.5.2)
FAO WIEWS institute code or Index Herbariorum code of the institute where the *ex situ* accession/herbarium specimen is maintained, or both.

19.1 **FAO WIEWS institute code** (INSTCODE)
(http://www.fao.org/wiews)

19.2 **Index Herbariorum code** (HERBCODE)
(http://sweetgum.nybg.org/science/ih/)

20. **Accession/specimen identifier** (3.2.5.1)
This is the unique identifier for accessions or specimens collected (e.g., genebank, herbarium, etc.) and is assigned when a sample/specimen is entered into the collection. One or more identifiers can be provided among the following:

20.0 ***Ex situ* accession DOI** (ACCEDOI)

20.1 ***Ex situ* accession number** (ACCENUMB)

20.2 **Herbarium specimen number** (SPECNUMB)

21. **Conservation actions in place** (3.5) (CONSACTION)
Indication whether conservation actions related to the population are in place. Use the IUCN classification scheme for conservation actions in place (available from https://nc.iucnredlist.org/redlist/content/attachment_files/dec_2012_guidance_conservation_actions_in_place_classification_scheme.pdf) (adapted). Multiple values are separated by a semicolon without space.

0 No conservation actions
1 Monitoring and Planning
2 Land/Water Protection and Management
3 Species Management
4 Education and Legislation
99 Other (elaborate in REMARKS field)

22. **MLS status of the material** (MLSSTAT)

The status of the material with regards to the Multilateral System of Access and Benefit-sharing of the International Treaty, if available.

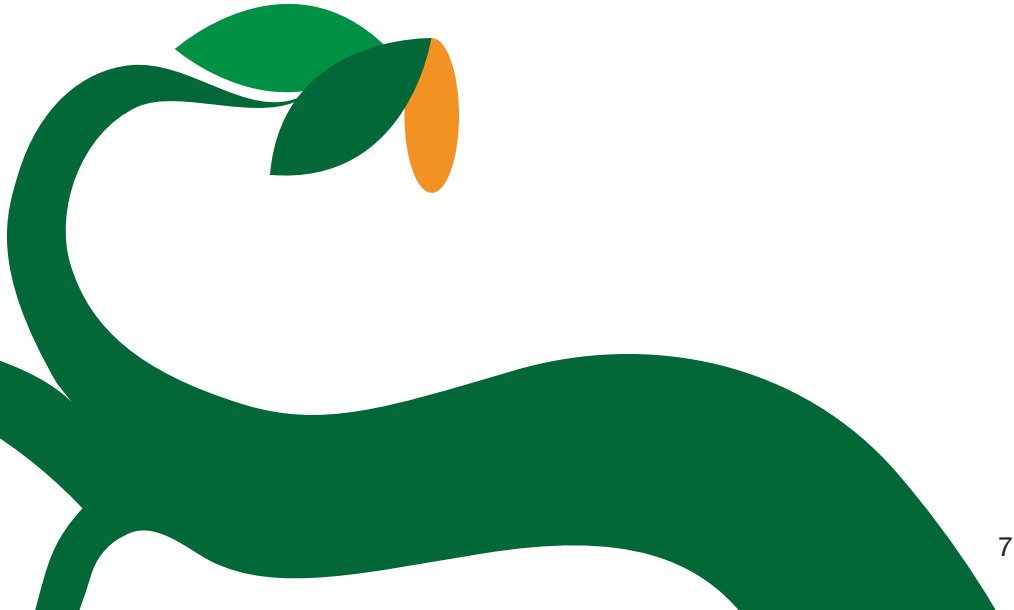
0 Not available under the MLS
1 Available under the MLS

23. **Links to associated information** (URL) (LINKS)

One or more URLs where further information about the CWR population can be found. Multiple values are separated by a semicolon without space.

24. **Remarks** (REMARKS)

The Remarks field is used to add notes or to elaborate on descriptors with value 99 or 999 (= Other). Prefix remarks with the field name they refer to and a colon (:) without space (e.g. SITESTAT:riverside). Distinct remarks referring to different fields are separated by semicolons without space.



OPEN QUESTION

Global Unique Identifier

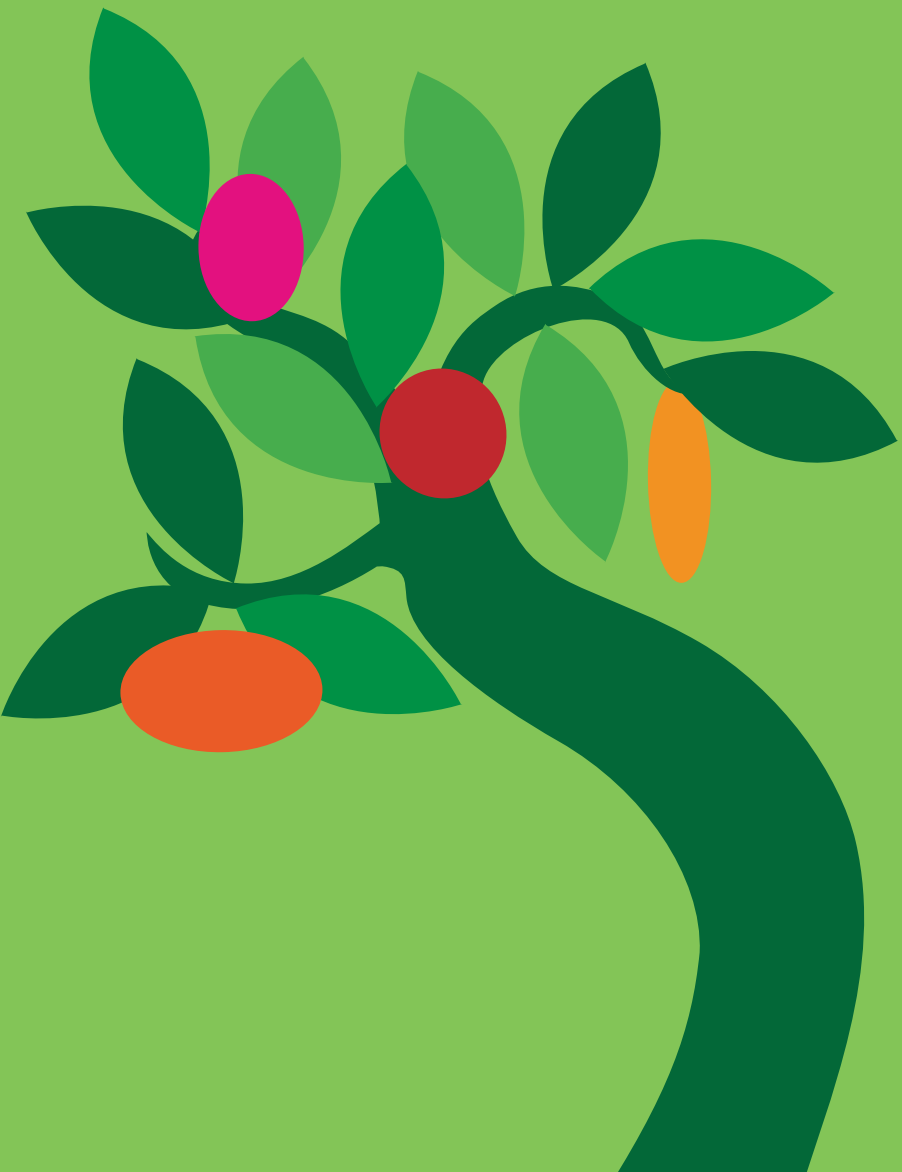
Various experts indicated that the use of a global unique and persistent identifier (PUID) would be useful to build automatic services to integrate CWR *in situ* data and to enable the desired linkages between populations and other genotype entities across different information systems.

The Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) facilitates the assignment of a persistent unique identifier (PUID), in the form of a Digital Object Identifier (DOI) to the Global Information System (GLIS) users, free of charge (https://ssl.fao.org/glis). The Secretariat is also available to provide training and support required by stakeholders for the adoption of DOIs.

DOIs go beyond the concatenation of fields and offer advanced services that would, for instance, facilitate the identification of germplasm safety duplicated in *ex situ* conditions (i.e. genebank or herbarium), or allow a flexible access to information associated to the CWR. Although different PUID technologies exist, DOIs have been selected as the best option by a panel of experts in 2015.

X. **Persistent Unique Identifier** (PUID)

It is any persistent unique identifier assigned to the population so it can be unambiguously referenced at the global level and the information associated with it harvested through automated means. Report one PUID for each population. For *ex situ* material DOIs have been adopted since 2017.



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