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Assignment of DOIs to wild populations

How can this be achieved? What are the pitfalls?

In situ Crop Wild Relatives in EURISCO Project Meeting, 18–19 June 2024, Sadovo, Bulgaria



How does it work for *ex situ* material?

The challenge of identification

- Genebanks have been existing for many decades
 - Description and use of plant genetic resources change continuously
 - May result in different accession identifiers over the time
 - Exchange between genebanks and provision of material to researchers and breeders
- *Use of local identifiers is limited (chains of identifiers over time)*
- *Difficult to trace transferred material*



Current number:
PIS 972

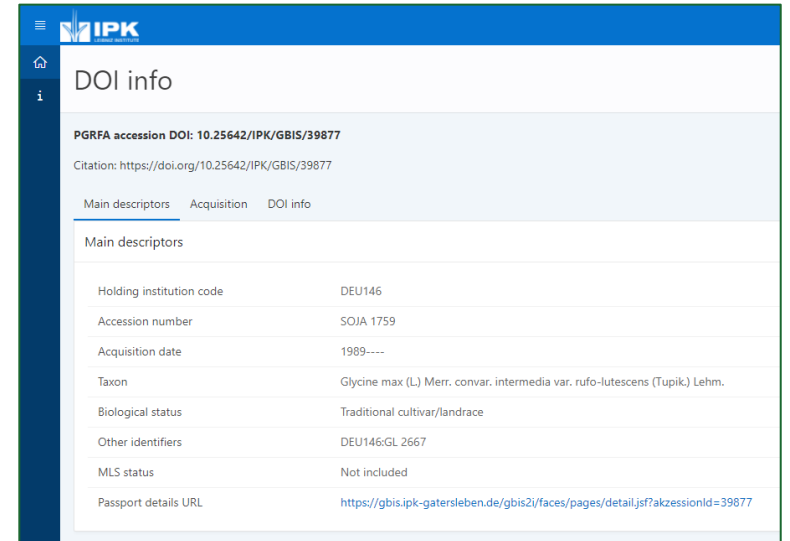
Previous numbers:
882/51, 2229/52,
6307/53, 8019/54,
1033/55, 9002/60,
1/61, 6001/62,
8004/62

The challenge of identification

- In addition to passport data, other domains exist
 - Phenotypic, genotyping, sequence data, etc.
 - Research projects, publications, etc.
 - Mapping to PGR accessions sometimes very difficult (e.g. old phenotypic data from CCDBs)
- Aggregating information systems, such as EURISCO, Genesys, WIEWS
 - Significant challenges with identical or changing identifiers
 - Use of MCPD standard (FAO) so far: Unique combination of FAO-WIEWS-CODE, GENUS and ACCESSION NUMBER
 - *Items are subject to changes*
 - *Need for widely accepted, unique and stable identifiers for genebank accessions*

DOIs

- ITPGRFA task force on permanent unique identifiers (2015)
→ *Recommended to use DOIs*
- DOI:
 - Unique and permanent digital identifier of a (digital) object
 - Metadata for the description of the object
 - Name resolution by a resolver system, e.g. *doi.org*
- Advantages:
 - Quasi-standard for PGR material
 - High acceptance in the scientific community
 - Allows traceability when material is distributed, e.g. to another genebank
 - Enables insights into the use of PGR, e.g. from publications
 - Hierarchical relationships possible, e.g. for derived material (SSD line from genebank accession)
- Disadvantages:
 - PGR accessions are not unchangeable (digital) objects
 - Metadata + landing page must be kept up to date



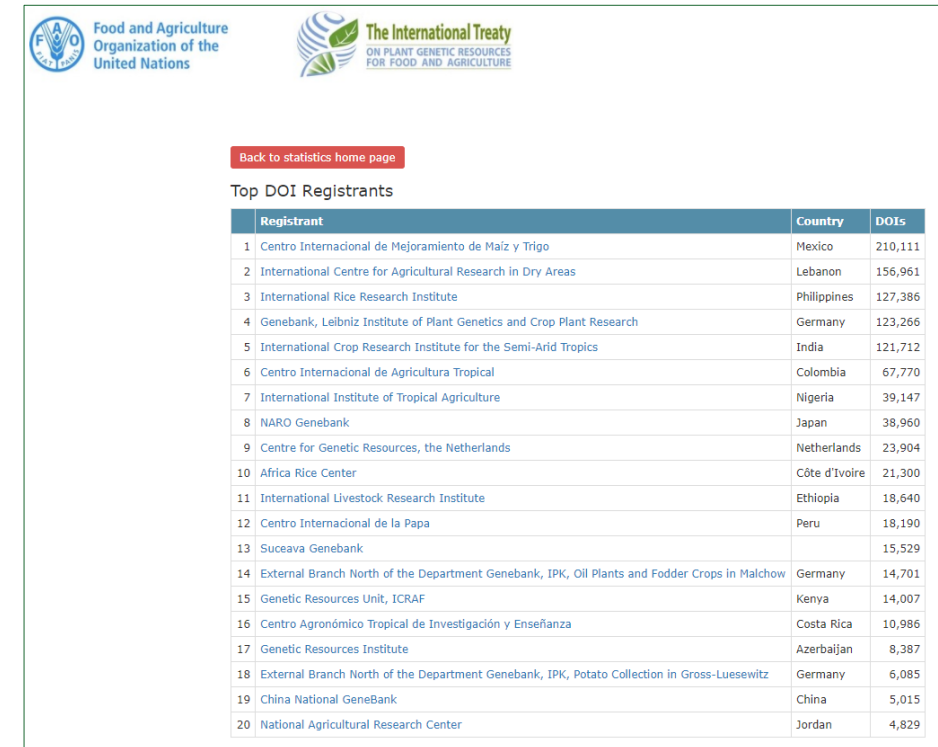
The screenshot shows the IPK website interface for a DOI. The page title is "DOI info" and the main heading is "PGRFA accession DOI: 10.25642/IPK/GBIS/39877". Below this, there is a citation: "Citation: <https://doi.org/10.25642/IPK/GBIS/39877>". There are three tabs: "Main descriptors", "Acquisition", and "DOI info", with "Main descriptors" selected. The "Main descriptors" section contains a table with the following data:

Holding institution code	DEU146
Accession number	SOJA 1759
Acquisition date	1989----
Taxon	Glycine max (L) Merr. convar. intermedia var. rufo-lutescens (Tupik) Lehm.
Biological status	Traditional cultivar/landrace
Other identifiers	DEU146:GL 2667
MLS status	Not included
Passport details URL	https://gbis.ipk-gatersleben.de/gbis2/faces/pages/detail.jsf?akzessionId=39877

Assignment of DOIs

- Own assignment of DOIs
 - E.g. via membership in the DataCite consortium
 - More freedom, but higher implementation costs (registration/update)
 - Provision and maintenance of own landing pages

- Use of the infrastructure of the ITPGRFA
 - Development of a GLIS-DOI portal
 - Central entry point for searching DOIs of plant genetic resources
 - Allows genebanks to register PGR material for DOIs free of charge
 - Allows registration of own DOIs (see above)
 - Increasingly accepted → more than 1.4 million DOIs in the GLIS-DOI portal
 - Easy registration
 - By XML-API
 - By Excel list
 - Landing pages are created by the Treaty
 - DOI metadata must be maintained



Food and Agriculture Organization of the United Nations

The International Treaty ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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Top DOI Registrants

	Registrant	Country	DOIs
1	Centro Internacional de Mejoramiento de Maíz y Trigo	Mexico	210,111
2	International Centre for Agricultural Research in Dry Areas	Lebanon	156,961
3	International Rice Research Institute	Philippines	127,386
4	Genebank, Leibniz Institute of Plant Genetics and Crop Plant Research	Germany	123,266
5	International Crop Research Institute for the Semi-Arid Tropics	India	121,712
6	Centro Internacional de Agricultura Tropical	Colombia	67,770
7	International Institute of Tropical Agriculture	Nigeria	39,147
8	NARO Genebank	Japan	38,960
9	Centre for Genetic Resources, the Netherlands	Netherlands	23,904
10	Africa Rice Center	Côte d'Ivoire	21,300
11	International Livestock Research Institute	Ethiopia	18,640
12	Centro Internacional de la Papa	Peru	18,190
13	Suceava Genebank		15,529
14	External Branch North of the Department Genebank, IPK, Oil Plants and Fodder Crops in Malchow	Germany	14,701
15	Genetic Resources Unit, ICRAF	Kenya	14,007
16	Centro Agronómico Tropical de Investigación y Enseñanza	Costa Rica	10,986
17	Genetic Resources Institute	Azerbaijan	8,387
18	External Branch North of the Department Genebank, IPK, Potato Collection in Gross-Luesewitz	Germany	6,085
19	China National GeneBank	China	5,015
20	National Agricultural Research Center	Jordan	4,829

Source: <https://ssl.fao.org/glis/>

Assignment of DOIs

- Assignment via EURISCO
 - Through cooperation ITPGRFA/EURISCO
 - EURISCO can register PGR material with the GLIS-DOI portal at the request of an NFP
 - Prerequisite: Accession listed in EURISCO
 - This is done on behalf of the responsible genebank
 - Landing pages are created by the Treaty
 - DOI metadata does not need to be maintained by the genebank
 - Changes to the passport data are automatically transferred to the GLIS-DOI portal as DOI metadata

EURISCO DOI service



- Only possible for accs. with acquisition date
- Registration process:
 - Genebank sends its request for DOIs to its NFP
 - NFP submits the request to EURISCO
 - INSTCODE, GENUS, ACCENUMB (all passport data in EURISCO)
 - Permanent identifier number (PID) of Treaty's Easy-SMTA
 - EURISCO does the registration with the GLIS-DOI portal
 - Use of minimum set of passport descriptors only
 - Handover of DOIs to the NFP → transfer to requesting genebank
- Requesting genebank needs to maintain the new DOIs together with their passport data

The screenshot shows the cover page of the EURISCO DOI service document. At the top left is the EURISCO logo with the tagline 'Finding seeds for the future' and the website URL 'http://eurisco.ecpgr.org'. The title 'EURISCO DOI service' is centered. Below the title, the date '2019-05-08' and version '1.0' are listed. A table of contents follows, listing 'Introduction' (1), 'Registration of accessions' (2), and 'Update of meta data' (3). The '1 Introduction' section is expanded, containing three paragraphs of text explaining the purpose of DOIs, the role of EURISCO, and the registration process.

eurisco
Finding seeds for the future
<http://eurisco.ecpgr.org>

EURISCO DOI service

Date: 2019-05-08
Version: 1.0

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1 Introduction

In order to exchange plant genetic resources (PGR) and all the associated information, the unique identification of material is indispensable. So far, a combination of MCPD attributes – holding institute code, genus name and accession number – is being used for this purpose. However, these attributes are subject to changes, thus hampering the identification of PGR accessions. Permanent unique identifiers in the form of Digital Object Identifiers (DOI) offer the potential to master this challenge.

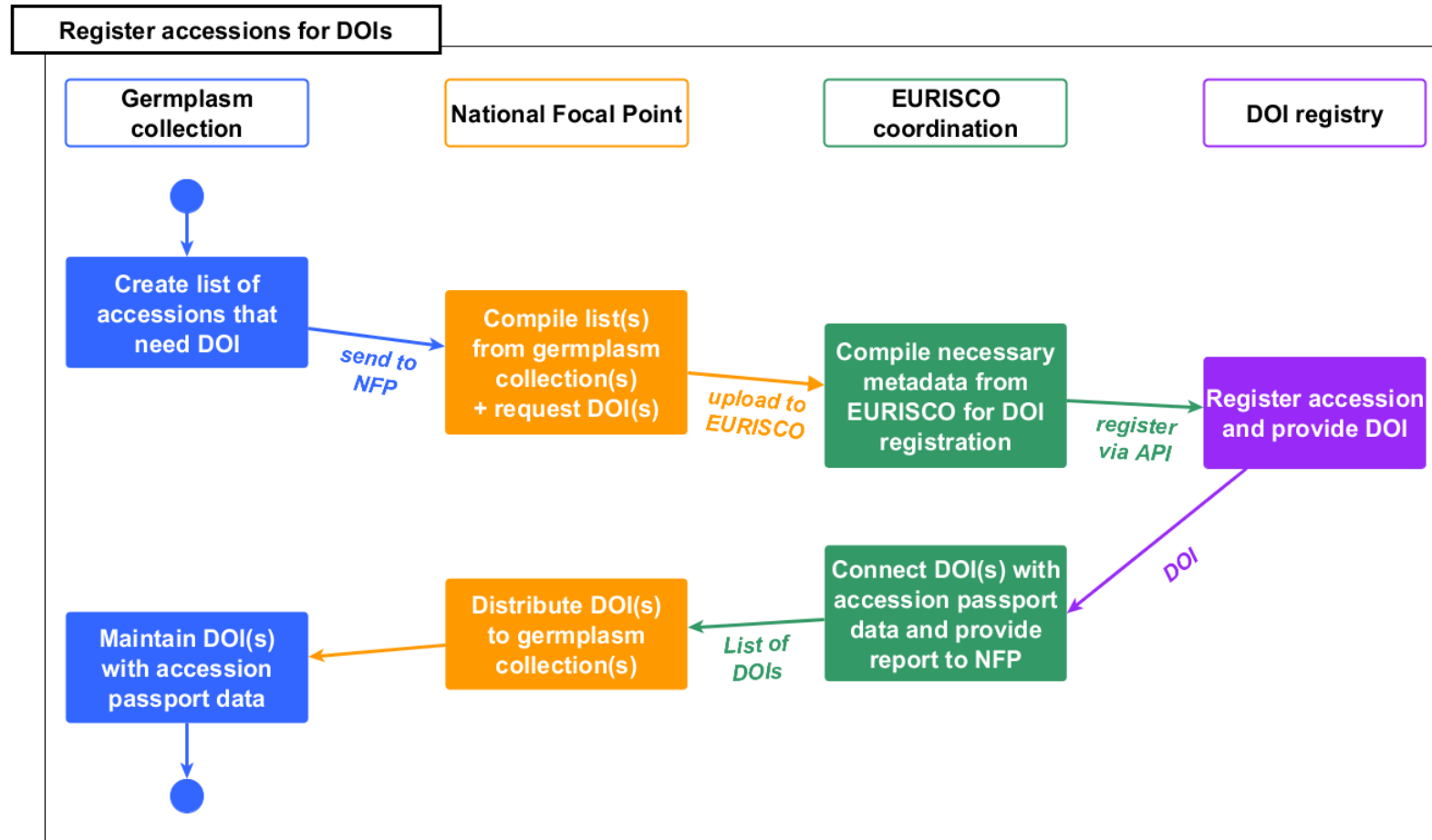
For EURISCO, DOIs provide the possibility to simplify the data management in the long run. In the frame of the Global Information System (GLIS), the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) provides the infrastructure for registering genebank accessions for DOIs free-of-charge.

Thanks to the continuous efforts of the National Inventory Focal Points, EURISCO has all information necessary for the DOI registration with the GLIS. Thus, in agreement with the EURISCO Advisory Board, a EURISCO service was implemented to support the DOI registration. Thereby, EURISCO acts as a mediator in the registration process and hands over the issued DOIs to the respective National Inventory Focal Point.

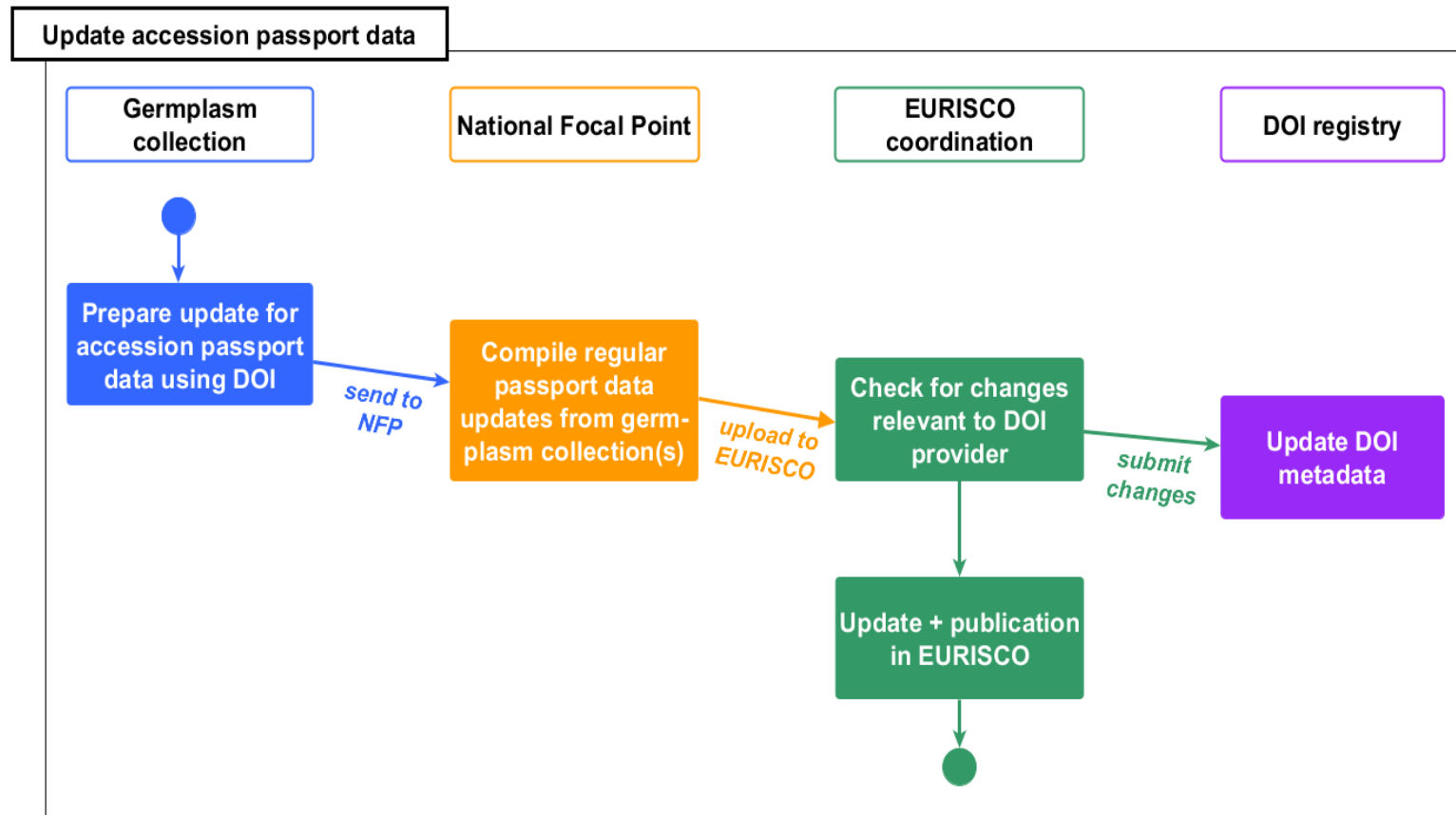
Please note that DOIs for genebank accessions are recommended, but not mandatory. If you want to register material for DOIs, please feel free to use this optional service of EURISCO or, if you prefer, to register with the GLIS directly.

1

EURISCO DOI service



EURISCO DOI service



What is different with *in situ* material?

To be discussed...

- Assignment of DOIs
 - Technically easy, but who will do this?
 - *In situ* NFP on behalf of the maintainers as in the case of *ex situ* accessions?
- More important
 - Who will be the owner of the DOI?
 - Landowner/maintainer of the *in situ* population?
 - National Focal Point?
 - Genebank holding an *ex situ* backup?
 - ...
 - Will the owner of the DOI accept this additional information?
 - Information must be managed (whatever the data management looks like)
 - Must always remain linked to the material (even if names/labels etc. are changed)
 - ...
 - What happens if the landowner withdraws *in situ* CWRs from the National Inventory?
 - Invalidation of DOI?
 - Flagging as “historic” material?
 - ...