

# Linking *ex situ*, on farm and *in situ* PGRFA documentation in EURISCO – a case from Germany -

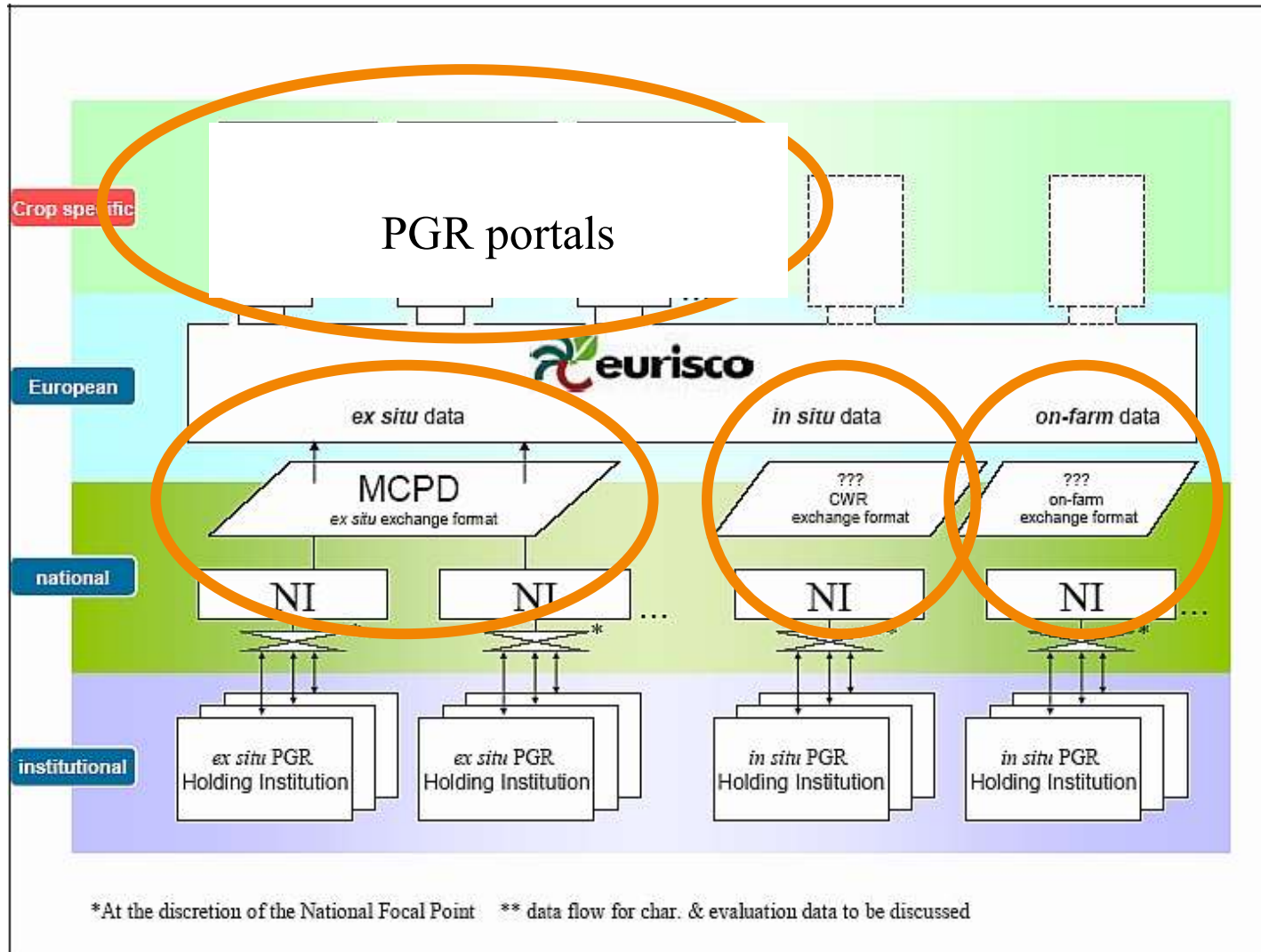
ECPGR, Prague, 22-24 May 2014

**Frank Begemann**

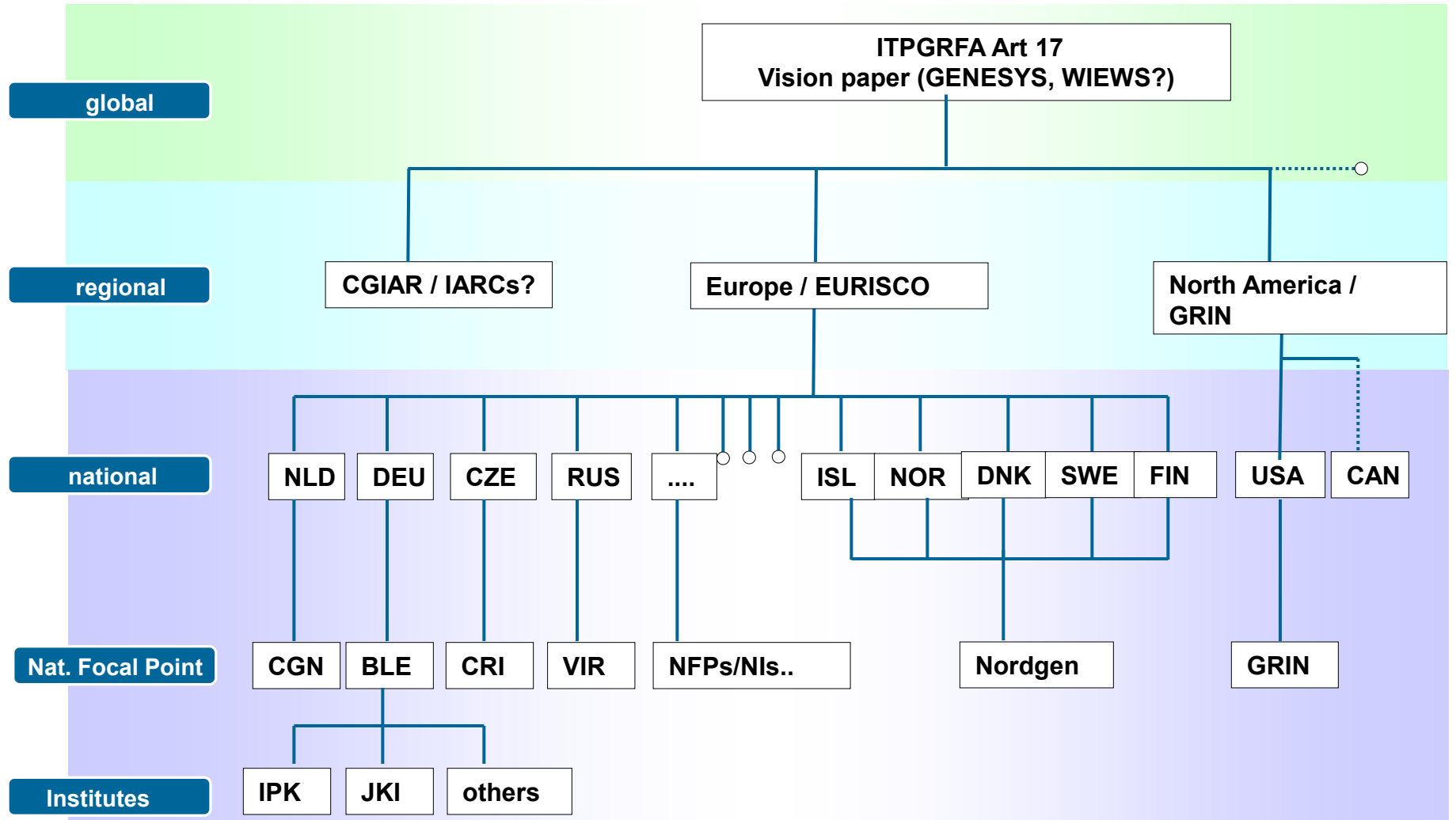
Federal Office for Agriculture and Food (BLE)

Group Director, sustainability, international agricultural affairs

# Old or new vision for EURISCO?



# Old or new vision for EURISCO?



# EURISCO content

## Passport data

- *ex situ*
- on farm
- *in situ*

## Characterization and evaluation data

- multicrop (C&E format)

## Links

- PGR Portals
- selected websites (ECPGR, ITPGRFA, GENESYS etc.)

## Data sources

- NI/NFP 41 *ex situ*
- NI/NFP 32 on farm
- NI/NFP 31 *in situ*
- NFP *ex situ*
- institutes authorised by NFP

# EURISCO prerequisites

## Institutes / databases

- strong institutional / genebank databases
- National Inventories (NI) at National Focal Points (NFP)

## Collaborative agreements

- ✓ EURISCO data sharing agreement (ECPGR – NFP)
- ✓ Agreements at national level (NFP – genebanks/institutes)

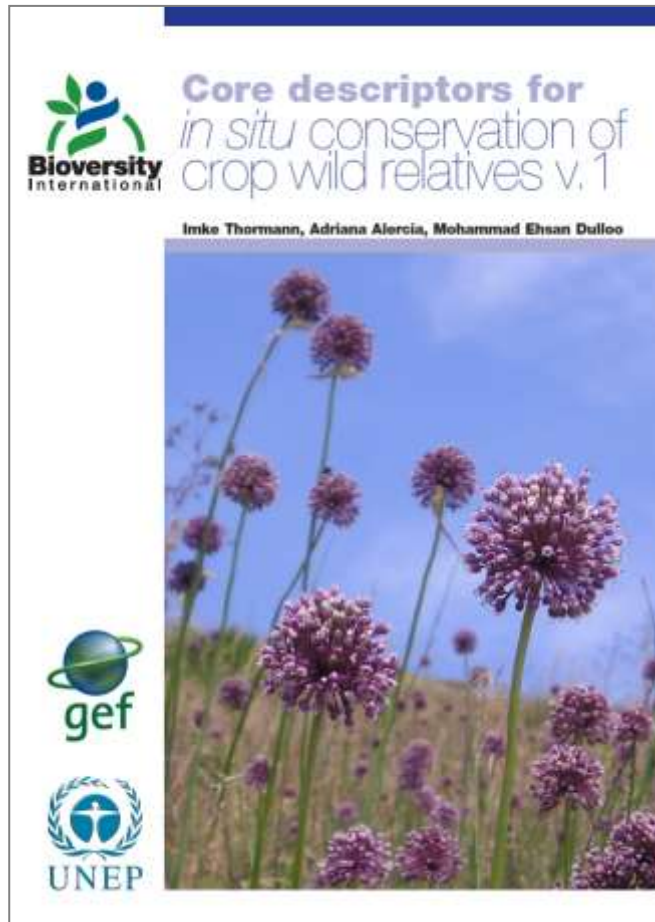
## Data exchange formats

- ✓ *ex situ* (MCPD/FAO/IPGRI/EURISCO)
- on farm: *to be agreed (role of PGRFORUM, AEGRO, PGRSECURE ?)*
- *in situ*: *to be agreed (role of Bioversity, PGRFORUM, PGRSECURE ?)*

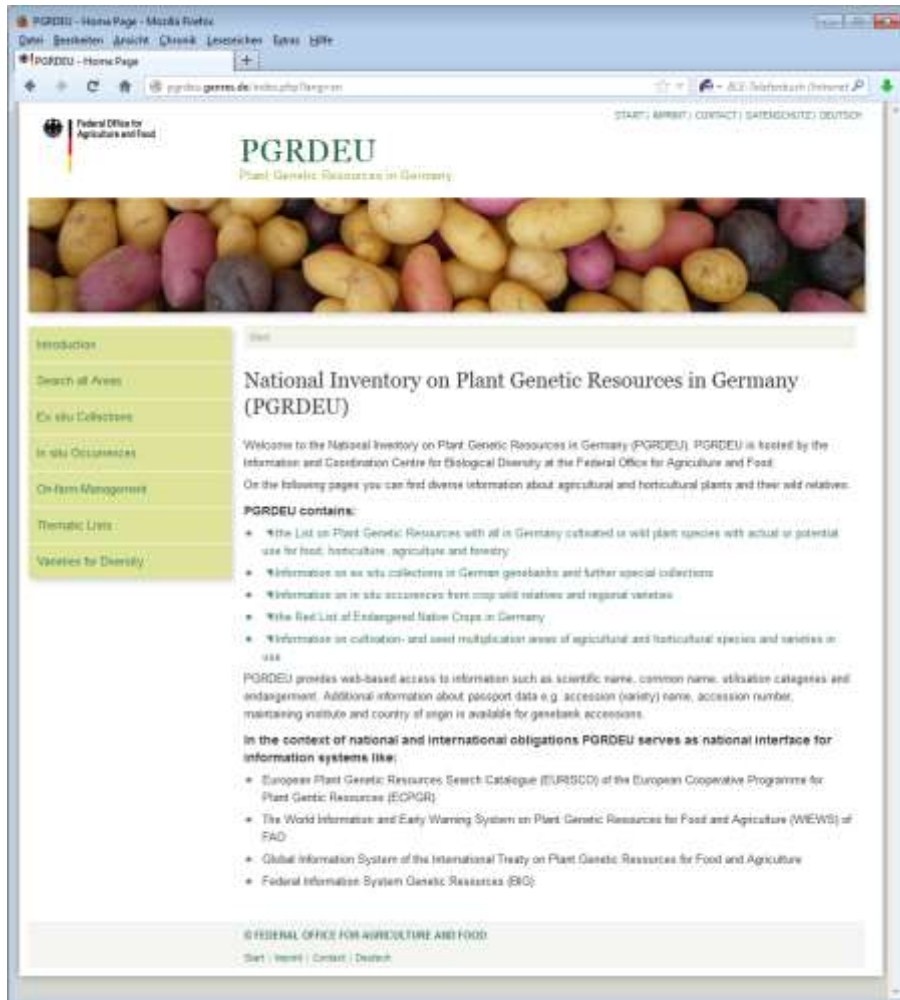
# EURISCO descriptors (*ex situ*)

MCPDv2 + EURISCO DESCRIPTORS	
<p><b>0. National Inventory code</b> (NICODE)</p> <p>Code identifying the National Inventory; the code of the country preparing the National Inventory. Exceptions are possible, if agreed with EURISCO such as NGB.</p> <p>Example: NLD</p>	
<p><b>1. Institute code</b></p> <p>FAO Institute Code of the institute where the accession is maintained</p> <p>Example: NLD037</p>	<p><b>30. Decoded breeding institute</b> (BREDESCR)</p> <p>Brief name and location of the breeding institute. Only to be used if BREDCODE can not be used since the FAO Institution Code for this institute is not (yet) available.</p> <p>Example: CFFR from Chile</p>
<p><b>2. Accession number</b></p> <p>This number serves as a unique identifier for accessions within a gen is entered into the genebank collection.</p> <p>Example: CGN00254</p>	<p><b>31. Decoded donor institute</b> (DONORDESCR)</p> <p>Brief name and location of the donor institute. Only to be used if DONORCODE can not be used since the FAO Institution Code for this institute is not (yet) available.</p> <p>Example: Nelly Goudwaard, Groningen, The Netherlands</p>
<p><b>3. Collecting number</b></p> <p>Original number assigned by the collector(s) of the sample, normally collector(s) followed by a number. This number is essential for identification.</p> <p>Example: FA90-110</p>	<p><b>32. Decoded safety duplication location</b> (DUPLDESCR)</p> <p>Brief name and location of the institute maintaining the safety duplicate. Only to be used if DUPLSITE can not be used since the FAO Institution Code for this institute is not (yet) available.</p> <p>Example: Pakhoed Freezers inc., Paramaribo, Surinam</p>
<p><b>4. Collecting institute code</b></p> <p>Code of the Institute collecting the sample. If the holding institute has code (COLLCODE) should be the same as the holding institute code</p> <p>Example: NLD037</p>	<p><b>33. Accession URL</b> (ACCEURL)</p> <p>URL linking to additional data about the accession either in the holding genebank or from another source.</p> <p>Example: <a href="http://www.cgn.wageningen-ur.nl/pgr/collections/passdata.asp?accenumb=CGN04848">www.cgn.wageningen-ur.nl/pgr/collections/passdata.asp?accenumb=CGN04848</a></p>
<p><b>4.1 Collecting institute name</b></p> <p>Name of the institute collecting the sample. This descriptor should be the FAO WIEWS code for this institute is not available. Multiple value</p>	<p><b>34. MLS Status</b> (MLSSTAT)</p> <p>The coded status of an accession with regards to the Multilateral System (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture.</p> <p>Provides the information, whether the accession is included in the MLS.</p> <p>0- not part of the MLS 1- part of the MLS. If the MLS status is unknown, the field stays empty</p>
<p><b>4.1.1 Collecting institute address</b></p> <p>Address of the institute collecting the sample. This descriptor should be the FAO WIEWS code for this institute is not available. Multiple value</p>	
<p><b>4.2 Collecting mission identifier</b></p> <p>Identifier of the collecting mission used by the Collecting Institute (4 or 5 digits)</p> <p>Example: CIATFOR-052;CN426</p>	
<p><b>5. Genus</b></p> <p>Genus name for taxon. Initial uppercase letter required.</p> <p>Example: Allium</p>	<p><b>35. AEGIS Status</b> (AEGISSTAT)</p> <p>The coded status of an accession with regards to the European Genebank Integrated System (AEGIS).</p> <p>Provides the information, whether the accession is conserved for AEGIS.</p> <p>0- not part of the MLS 1- part of the MLS. If the MLS status is unknown, the field stays empty</p>
<p><b>6. Species</b></p> <p>Specific epithet portion of the scientific name, in lowercase letters. Or the authority for the species name.</p> <p>Example: paniculatum</p>	
<p><b>7. Species authority</b></p> <p>The authority for the species name.</p>	

# International descriptors *in situ* (CWR)                      on farm (landraces)



# National Inventory Germany (NI)



## Selected Objectives

- Defining the scope of the National Programme for PGRFA
- Central national documentation of PGRFA (collecting data from German Federal States and relevant stakeholders)
  - *ex situ*
  - *in situ*
  - on farm
- National, regional and international reporting



# NI Germany: Scope



START | IMPRINT | CONTACT | DATENSCHUTZ | DEUTSCH

**PGRDEU**  
Plant Genetic Resources in Germany

introduction  
Search of Access  
Ex situ Collections  
In situ Occurrences  
On-farm Management  
Thematic Lists  
List of Plant Genetic Resources in Germany  
Search by species  
Search forms of utilisation  
Endangerment  
Varieties for Diversity

Start > Thematic Lists > List of Plant Genetic Resources in Germany

## List of Plant Genetic Resources in Germany

For Germany, within the framework of the National Programme, a comprehensive list of German plant species (crops and wild plant species) categorised according to their utilisation has been compiled.

The present database contains information of all plant species (including crop-wild relatives and wild plants) and where appropriate their intraspecific taxa with current or potential value for food, agriculture and forestry occurring in Germany. The current List of Plant Genetic Resources (PGR List) comprises 3,600 species grouped into different categories of use, whereas the categories "horticultural plant" and "breeding" have not been completed yet.

The PGR List provides summarised information about species and their utilisation and enables users to search and access detailed information about species or corresponding categories of utilisation.

Plant genetic resources of agricultural and horticultural crops are defined as propagative material of plants used in the past, present or with potential utilisation value including wild relatives.

The PGR List substantiates the given definition of crops. As a result all plant genetic resources are correlated to their utilisation. The PGR List is divided into the following categories:

AG:  medicinal and aromatic plants

3.600 PGRFA species (CWR & cultivated crops) in total,

thereof : 2.900 CWR (*in situ*)

thereof : 1000 CWR without exclusive ornamental and breeding uses

## Search forms of utilisation

MEDICINAL AND AROMATIC PLANTS:

PROTEIN PLANTS:

FOREST PLANTS:

FORAGES:

SUGAR / STARCH PLANTS:

OIL PLANTS:

FRUIT AND VEGETABLES:

POLLEN, NECTAR PLANTS:

TECHNICAL USE (E.G. FIBRE):

PROTECTION (SUN/WIND):

ORNAMENTAL PLANTS:

BREEDING AND BREEDING RESEARCH:

CROP WILD RELATIVES :



# NI Germany: Reporting obligations



PGRDEU

Plant Genetic Resources in Germany

START | IMPRINT | CONTACT | DATA PRIVACY | DEUTSCH



The International Treaty

ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE



Introduction

Search all Areas

-Suche

Ex situ Collections

In situ Occurrences

On-farm-Management

Thematic Lists

Varieties for Diversity

Start | Search all Areas

## Search all Areas

Search this area for an overview on speci

- in the ex situ collections.
- in the in situ and on-farm occurrences
- on the Red List of Endangered Native
- on cultivation and seed propagating a

By means of a link you can refine your se  
» Go to search

## Contribution of Germany to th Genetic Resources

Germany has ratified the International Tri  
and is fully supportive of its objectives. w  
food and agriculture and the fair and equi  
convention on Biological Diversity.

A core element of the Treaty is the Multil  
include all plant genetic resources for foo  
and control of the Contracting Parties and  
holders of the plant genetic resources for  
System.

Germany notifies the following plant gene  
Germany that have been included in the Multilateral System:

**110,295 Accessions**

## » Germany

>>Federal Ministry of Food, Agriculture and Consumer Protection

The Federal Ministry of Food, Agriculture and Consumer Protection of Germany has notified the Secretary of the Treaty that more than 100,000 accessions that are held in the collections of the Genebank of the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), and the Fragaria and Malus collections held by the Federal Research Centre for Cultivated Plants have been included in the Multilateral System. The German material is fully described by the German National Inventory for Plant Genetic Resources for Food and Agriculture (PGRDEU). website: [pgrdeu.genres.de/?lang=en](http://pgrdeu.genres.de/?lang=en)

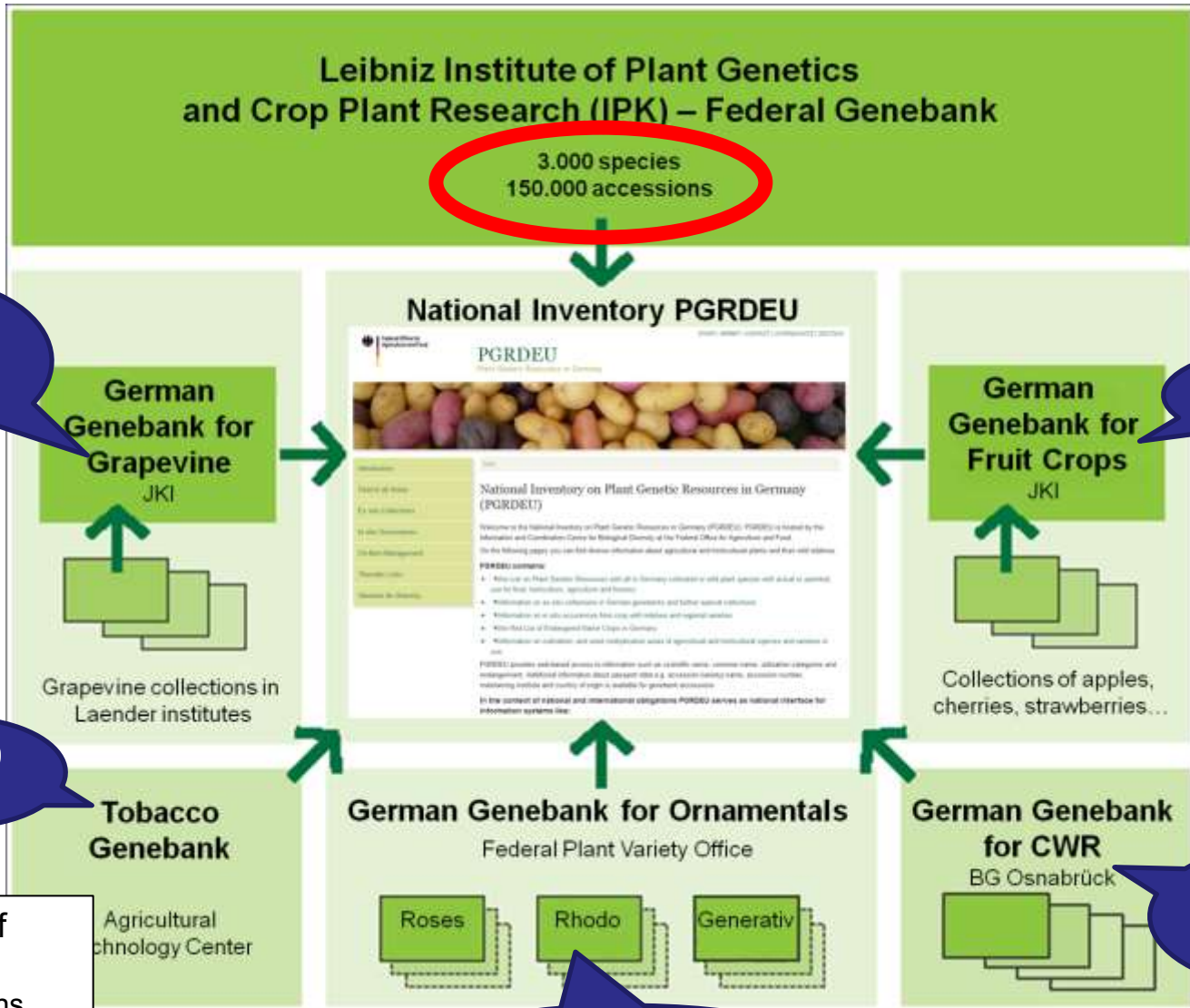
Date of the notification: 25/07/2008

Updated number of accessions: 108,675

[Read the notification](#)

[Website: National Inventory for Plant Genetic Resources for Food and Agriculture in Germany \(PGRDEU\)](#)

# Ex situ documentation of PGR in Germany



>4,400 acc.

>1,000 acc.

Ca 800 acc.

>3,000 acc.

>12,000 acc.

Memorandum of Understanding:  
 • rights & obligations  
 • standards for data exchange  
 • ...

# *In situ* documentation of PGR in Germany

- **Scope :**
  - 2,900 crop wild relatives (wild species)
  
- ***In situ* data included from:**
  - projects funded by BLE / BMEL, e.g.:
    - Development of a Reporting and Monitoring System for the *In situ* Conservation of Genetic Resources of Crop Wild Relatives in Brandenburg (2007 - 2010)
    - Securing the Viability of the Wild Grape *Vitis vinifera* L. ssp. *sylvestris* C.C. Gmel. in the old Rheinaue wetlands through targeted *In-situ*-Management (2008-2013)
  - selected publications
  - EURISCO



# *In situ* documentation of PGR in Germany

## Establishment of CWR network of networks

(genetic reserves):

based upon knowledge of important occurrences / locations

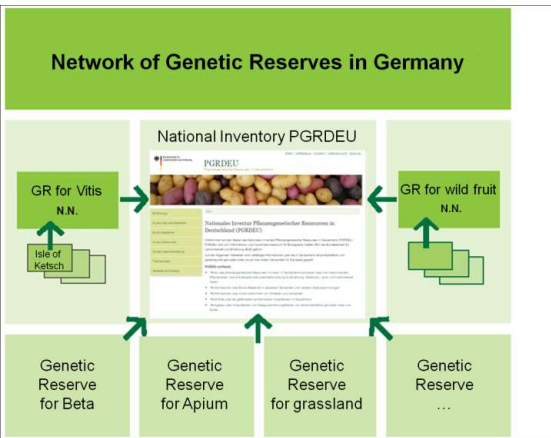
- *Vitis vinifera* L. ssp. *sylvestris* C.C. Gmel.
- *Malus sylvestris* (L.) Miller
- *Beta vulgaris* L. subsp. *maritima* (L.) Arcang.
- *Apium* species
- selected pastures / forages
- others (stepwise)



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# *In situ* documentation of PGR in Germany

based upon knowledge of important occurrences / locations

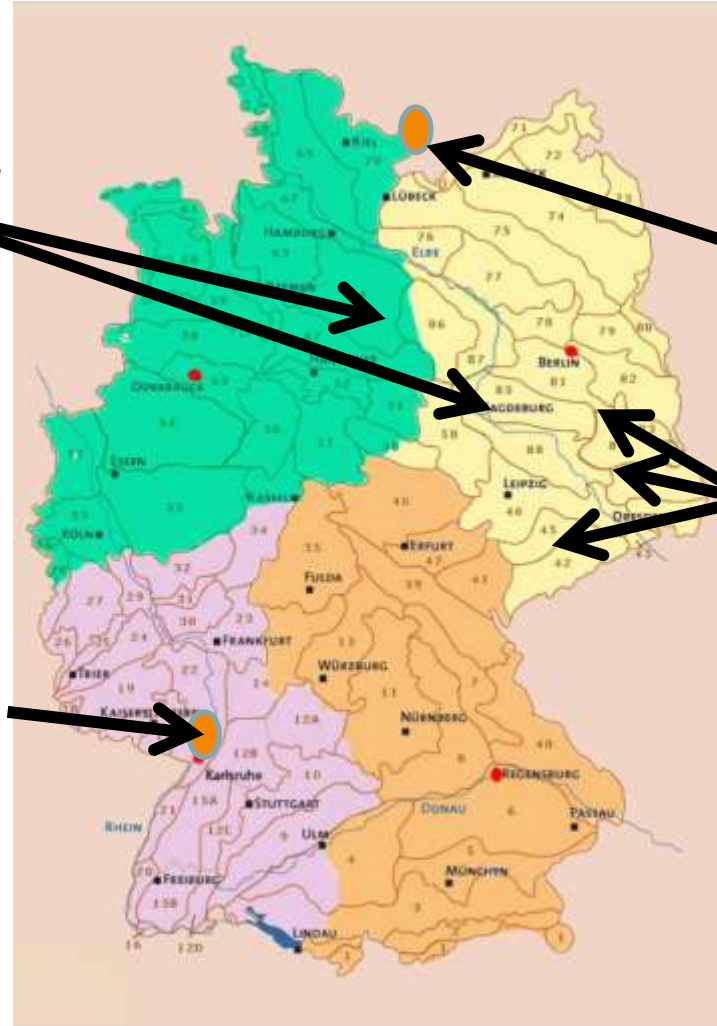


Apium?  
*Investigations*

Beta?  
*Drießen, S. (2003): Beta vulgaris subsp. maritima*

Malus sylvestris?  
*Investigations*

Vitis vinifera subsp. sylvestris



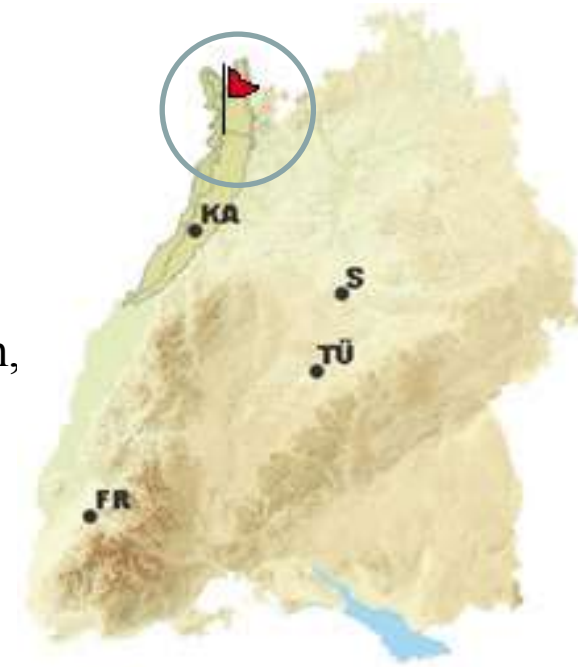
# *In situ* documentation of PGR in Germany

## Genetic reserve for *Vitis vinifera* ssp. *silvestris*

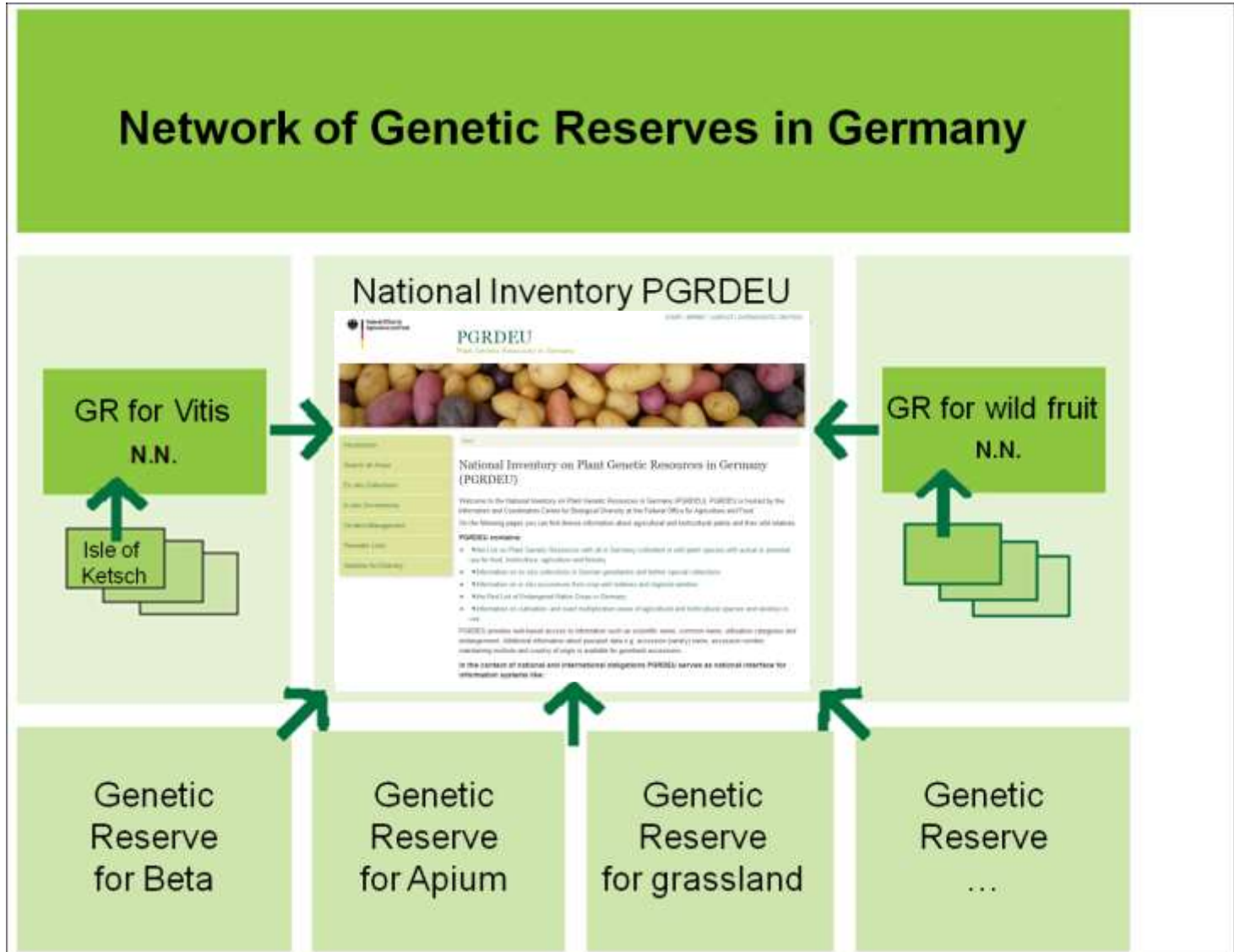
Location: Ketsch Island in river Rhine (near Karlsruhe)

Coordination: NN

Partner: City of Ketsch, KIT-Karlsruhe,  
WWF- Aueninstitute, Botanic Garden KA,  
Reg.Präs. KA, local forestry office,  
Forestry Research Freiburg, JKI Siebeldingen,  
(pilot contract in progress)



# *In situ* documentation of PGR in Germany

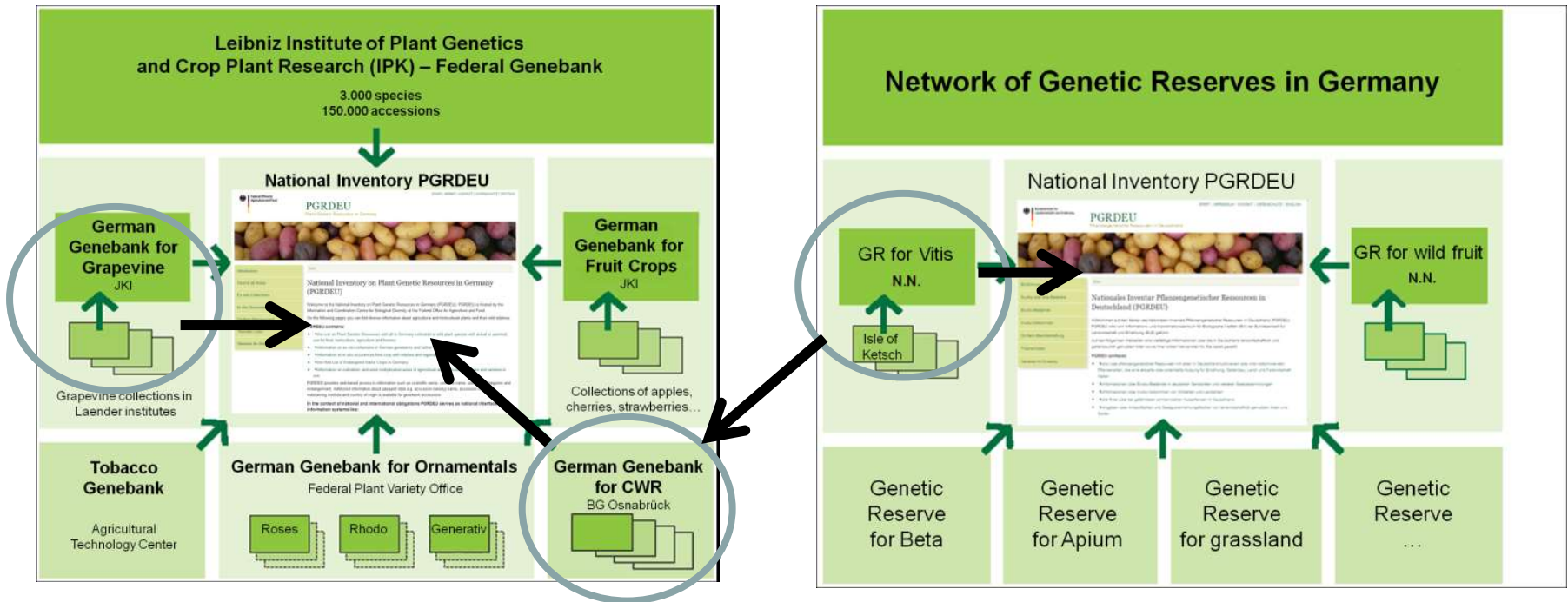




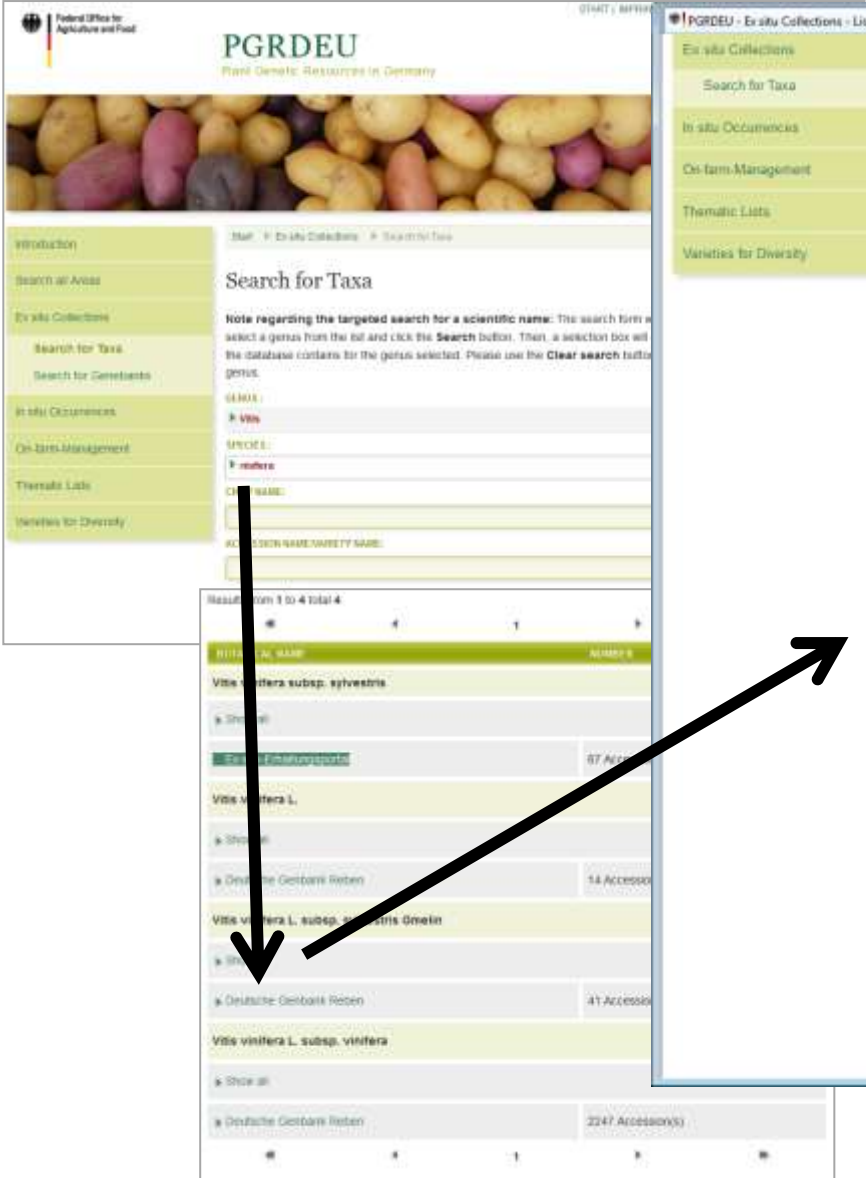
# Linking ex situ and in situ conservation activities via documentation

*ex situ*

*in situ*



# Linking *ex situ* and *in situ* documentation start search *ex situ*



### Characteristics of Accession: DEU098-1980-103

<b>Maintaining institute</b>	
Genebank/Genebank Network	Deutsche Genbank Reben
Maintaining institute name	Federal Research Centre for Cultivated Plants - Institute for Grapevine Breeding Geilweilerhof
Maintaining institute code	DEU098
<b>Taxonomic information</b>	
Botanical name	Vitis vinifera L. subsp. sylvestris Gmelin
Accession name	SYLVESTRIS KETSCH 2-39
<b>Detail information of accession</b>	
Accession number	DEU098-1980-103
Acquisition date	2010
Biological status of accession	Semi-natural/wild (120)
Type of germplasm storage	Field collection (20)
Accession URL	<a href="http://www.deutsche-genbank-reben.jki.bund.de/">http://www.deutsche-genbank-reben.jki.bund.de/</a>
<b>Information on the collection of the accession</b>	
Collecting/ acquisition source	Institute, Experimental station, Research organization, Genebank (40)
<b>Information on the donor</b>	
Name	Federal Research Centre for Cultivated Plants - Institute for Grapevine Breeding Geilweilerhof (DEU098)
<b>More information</b>	
Data Status	Feb 13, 2014

# Linking *ex situ* and *in situ* documentation start search *in situ*



The screenshot shows the PGRDEU website interface. The navigation menu on the left includes 'Introduction', 'Search at AVIS', 'Ex situ Collections', 'Search for Taxa', 'In situ Occurrences' (circled in red), 'Threats List', and 'Network for Diversity'. The main content area shows a search result for 'Vitis vinifera L. sylvestris C.C. Gmel.' with a red box around the 'In situ Occurrences' link in the breadcrumb trail. A black arrow points from the 'In situ Occurrences' link in the left menu to the 'Status' field in the taxonomic information table.

Start > **In situ Occurrences** > Occurrences of Crop Wild Relatives > Observation list > Characteristics  
 Characteristics of observation: *Vitis vinifera* L. *sylvestris* C.C. Gmel.

Zurück

#### Taxonomic information

Botanical name	<i>Vitis vinifera</i> L. <i>sylvestris</i> C.C. Gmel.
Common crop name	Wilde Rebe; Wildrebe; Europäische Wildrebe
Terms of utilisation	Fruit and vegetables, Breeding and breeding research
Status	einheimisch (1)
Category of Endangerment on the Red List of Plants in Germany	(1 (Baden-Württemberg und Rheinland Pfalz); 0 (Hessen))
Legal protection	Art in Anhängen der FFH-Richtlinie nicht aufgeführt (nein)
EU-VOICITES	(nein)
Federal Nature Conservation Act	streng geschützt
Location	
Geographical classification	Baden-Württemberg; Rhein-Neckar-Kreis
Description of locality	Boden: Pararendsina; Vegetation: Hainbuchenwälder (Carpinion Verband), Eichen-Hainbuchenwald (Carpinion betuli Issler 1931); ehemalige Nutzung: Mittelwald; Überschwemmung: aktuell keine
Locality lies in reserve	Yes
Reserve Category	NSG: Ketscher Rheininsel
Land use	Laubwald
Ownership	Public property (2)

Risk factors at the site	Mangel an Keimungs- und Etablierungsplätzen, Forstliche und pflegerische Maßnahmen, Verbiss
Measures for the locality	Förderung der Naturverjüngung, Schutz der vorhandenen Wildreben
Information on population	
Origin of population	natural (1)
Vitality of occurrence	damaged (2)
Estimation of species abundance	rare (1)
Gathering institution	Frau Dr. Ledesma-Krist (WWF-Auen-Institut, ifGG, KIT); Herr Heene (Botanisches Institut I, KIT)
Number of males	35
Number of females	37
Information on the collection of the accession	
Collective number	KE 114
Collecting institution	
Data Status	May 14, 2014
Conservation of the species outside of its natural habitats (ex situ conservation)	
Collecting samples of the population is maintained ex situ	Yes
Maintaining institute	
Maintaining institute code	DEU494
Connecting to accessions	<b>Akzessionen in Einrichtung DEU494 (Anzahl: 1)</b> Link 1

# On farm documentation of PGR in Germany

## ■ Scope :

- landraces as defined by EU seed legislation
  - conservation varieties (to be replaced by?)
  - amateur varieties (to be replaced by?)
- “old” varieties (to be discussed?)
- “non-defined” landraces growing on farm land



## ■ On farm data included from:

- projects funded by BLE / BMEL, e.g.:
  - Survey on Grapevine Genetic Resources in Germany 2007-2009
- Cultivation data of regional crop landraces from *Länder* programmes of some *Länder*
- Cultivation and seed propagation areas of species and varieties in use

# Linking on farm and ex situ information

## Vitis variety „Albana“

On farm

### Taxonomic Characteristics

► Zurück

German variety name	Albana
Historical conductivity name	ALBANA BIANCA (Goethe 1887)
International name	ALBANA_Pulliat 1888_Galet 2000, ALBANA BIANCA_Calo et al. 2006, (falsche) GARGANEGA BIJELA_Mirosevic 2003
Berry colour	weiß
Remarks	Garganega (Calo 2006) dürfte mit Kiralyzölö (Nemeth 1970) identisch sein
Variety in ex-situ conservation	Accessions in institution DEU098 Number: 1 <a href="#">► Link 1</a>
Variety in vineyard (s)	Baden: ► Link 1 to variety Albana in vineyard Baden

### Assessment of the virus status - Vineyard Baden

Varieties: Albana

Virus infection	40-60 %
Fanleaf	20-40 %
Roll virus	20-40 %

Ex situ

Characteristics of Accession: DEU098-1988-001

► Zurück

Maintaining institute	
Genebank/Genebank Network	Deutsche Genbank Reben
Maintaining institute name	Federal Research Centre for Cultivated Plants - Institute for Grapevine Breeding Gellweilerhof
Maintaining institute code	DEU098
Taxonomic information	
Botanical name	Vitis vinifera L. subsp. vinifera
Common crop name	wine grape
Accession name	ALBANA
Berry colour	green
Detail information of accession	
Accession number	DEU098-1988-001
Acquisition date	2011
Biological status of accession	Traditional cultivar/landrace (300)
Type of germplasm storage	Field collection (20)
Accession URL	► http://www.deutsche-genbank-reben.jki.bund.de/
Information on the collection of the accession	
Collecting/ acquisition source	Institute, Experimental station, Research organization, Genebank (40)
Information on the donor	
Name	CRA-Centro di Ricerca per la Viticoltura (ITA388)
Information about the exsitus and the breeder	
Ancestral date	GARGANEGA
More information	
Date Status	Feb 13, 2014

## Overview of the descriptors for the *ex situ*, *in situ* and on farm data in PGRDEU (13.05.2014)

Ex situ descriptors	In situ descriptors	On-farm descriptors
<b>Descriptors for the identification of the data set</b>		
NICODE	NICODE	NICODE
		NIENUMB
NFPEX?	NFPIN?	NFPON
<b>Taxonomic descriptors</b>		
GENUS	GENUS	GENUS
SPECIES	SPECIES	SPECIES
SPAUTHOR	SPAUTHOR	SPAUTHOR
SUBTAXA	SUBTAXA	SUBTAXA
SUBTAUTHOR	SUBTAUTHOR	SUBTAUTHOR
CROPNAME	CROPNAME	CROPNAME
ACCENAME	ACCENAME?	ACCENAME
<b>Description of the location</b>		
ORIGCTY	ORIGCTY	ORIGCTY
ELEVATION	ELEVATION	ELEVATION
DECLATITUDE	DECLATITUDE	DECLATITUDE
LATITUDE	LATITUDE	LATITUDE
DECLONGITUDE	DECLONGITUDE	DECLONGITUDE
LONGITUDE	LONGITUDE	LONGITUDE
COORDUNCERT	COORDUNCERT	COORDUNCERT
COORDATUM	COORDATUM	COORDATUM
GEOREFMETH	GEOREFMETH	GEOREFMETH
INSTCODE	OWNERCODE	FARMERID
		HOLDERNAME
	LOCATION	LOCATION
	OWNER	
	NATURRAUM	
	Land Use	



<b>Collection specific descriptors</b>		
COLLSITE	COLLSITE	COLLSITE
COLLDATE	COLLDATE	COLLDATE
COLLCODE	COLLCODE	COLLCODE
COLLDESCR / COLLNAME	COLLDESCR / COLLNAME	COLLDESCR / COLLNAME
COLLINSTADDRESS	COLLINSTADDRESS	COLLINSTADDRESS
COLLMISSID	COLLMISSID	COLLMISSID
COLLNUMB	COLLNUMB	COLLNUMB
COLLSRC	COLLSRC	COLLSRC
OTHERNUMB		
<b>Description of the population</b>		
ACCENUMB	Population Identifier	LRNUMB
	ORIGIN	
	VITALITY	
	NUMBER	AREA
	DOMINANCE	
	IUCN threat classification	
<b>Monitoring and measures at the place</b>		
	MONITORDATE	MONITORDATE
	MONITORNAME	MONITORNAME
	Monitoring Institute Code	
	Monitoring mission identifier	
	Conservation action in place	
	Conservation action classification	
	MEASURESDATE	

## Linking *ex situ* and *in situ* documentation

In situ descriptors		Ex situ descriptors
OWNERCODE (WIEWS)	⇒	DONORCODE or OTHERNUMB
Population Identifier	⇒	ACCENAME, DONORNUMB or OTHERNUMB
ACCENAME	⇒	ACCENAME
COLLLNUMB	⇐	COLLNUMB
ORIGCTY, collection data, coordinates	⇐	ORIGCTY together with collection data and coordinates



# Linking *ex situ* and on farm documentation

On farm descriptors		Ex situ descriptors
FARMERID (WIEWS)	⇒	DONORCODE or OTHERNUMB
LRNUMB	⇒	DONORNUMB or OTHERNUMB
ACCENAME	⇒	ACCENAME
COLLLNUMB	⇐	COLLNUMB
ORIGCTY, collection data, coordinates	⇐	ORIGCTY and SAMPSTAT together with collection data and coordinates



# Arguments for *in situ* and on farm data in EURISCO

- Documentation is key for broadening access to important *in situ* PGRFA for research and breeding (option for ITPGRFA: Art. 12.3 h)
  - genetic reserves may equally provide access to PGRFA under pre-defined conditions
- *In situ* data would make EURISCO attractive for other users (conservationists)
- On farm documentation may have some financial implications (EAFRD) and may serve registration requirements (seed legislation)
- On farm data could have a monitoring role (baseline data) and serve an indicator function for genetic erosion (e.g. an option for SEBI indicators)
- On farm data would make EURISCO attractive for other users (e.g. NGO; gardeners)
- Linkage of different data types offers synergies at accession level (on farm: characteristics, health...; *in situ*: locations, endangerment...)
- EURISCO become „one-stop-shop“

# Conclusions

- EURISCO should be able to serve international, regional, national and institutional / local requirements
- Reporting *in situ* and on farm data to EURISCO would complement the overview on PGRFA in Europe und would provide important additional information to promote research and breeding as well as conservation and monitoring purposes
- Useful descriptor sets for *in situ* and on farm reporting available for discussion; but we need
  - to amend some descriptors
  - to choose an appropriate smaller set of descriptors for reporting to EURISCO (less mandatory fields)
  - to set up a joint group of the *in situ*, on farm and doc & info WGs
- It is recommended to link the different data types in EURISCO

# *In situ* role for EURISCO



**CROP WILD RELATIVES.**  
Indispensable tools for  
the future of  
agriculture

**Why are CWR important?**  
CWR are the genetic wild relatives of crop plants. They are the source of genetic diversity that has been used to develop crop varieties that are resistant to pests and diseases, and that can tolerate harsh environmental conditions. CWR are also a source of new crop varieties that are more nutritious and have a better taste.

**Why are CWR important?**  
CWR are the genetic wild relatives of crop plants. They are the source of genetic diversity that has been used to develop crop varieties that are resistant to pests and diseases, and that can tolerate harsh environmental conditions. CWR are also a source of new crop varieties that are more nutritious and have a better taste.

**Where are CWR found around the world?**



**CONSERVING CWR**  
Conserving CWR is essential for ensuring the genetic diversity of our food systems. This can be done through a variety of methods, including in situ conservation (protecting wild populations in their natural habitats) and ex situ conservation (collecting and storing seeds or other genetic material in seed banks or gene banks).



**Crop Wild Relatives & Climate Change**



Home News Why CWR CWR Inventory Conservation Gaps Interactive Map

*Vitis vinifera* L. subsp. *sylvestris* (C. C. Gmel.) Hege  
Geno Pool Primary relative of *Vitis vinifera* L.

**Taxon**

Family: Vitaceae  
Taxon: *Vitis vinifera* L. subsp. *sylvestris* (C. C. Gmel.) Hege

**Geographical distribution**

*Beta vulgaris* L. subsp. *maritima* (L.) Arcang.  
Geno Pool Primary relative of *Beta vulgaris* L.

**Taxon**

Family:



**Nice vision?**

**Thank you for your attention**