

# European Plant Genetic Resources in the EURISCO information system

First Meeting of the ECPGR Berries Working Group,  
14<sup>th</sup> to 16<sup>th</sup> January 2020, Dresden, Germany

Stephan Weise  
15 January 2020



# INTRODUCTION AND BACKGROUND

# Background

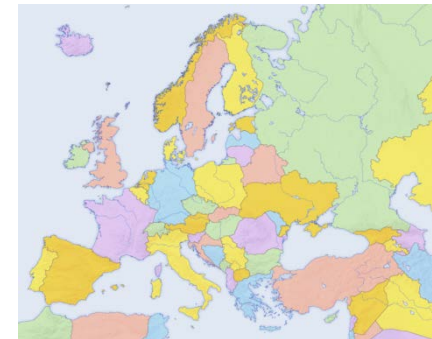
- What is EURISCO?
  - European information system for plant genetic resources
  - Search catalogue for *ex situ* collections
  - Accession-level information system
- Purpose
  - Provides passport data and phenotypic data about plant germplasm accessions maintained in Europe
  - Assists in meeting national obligations
    - Food and Agriculture Organization of the United Nations (FAO)
    - Convention on Biological Diversity (CBD)
    - International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)



[https://upload.wikimedia.org/wikipedia/commons/8/81/Europe\\_countries\\_map\\_2.png](https://upload.wikimedia.org/wikipedia/commons/8/81/Europe_countries_map_2.png)

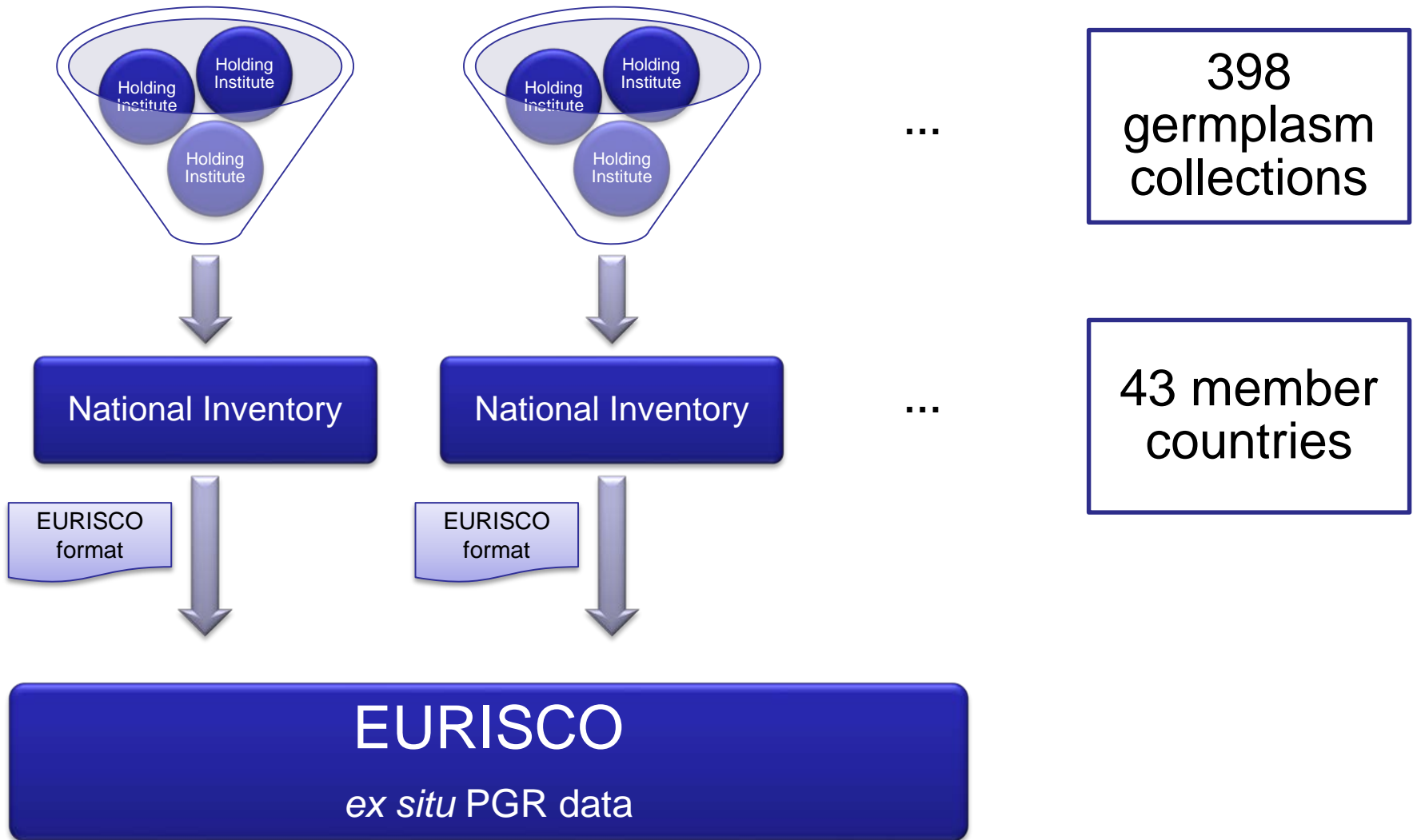
# Development

- Started in 1999 (EU project EPGRIS)
- 43 countries involved  
(Nordic Countries → NordGen)
- National collections represented by  
National Inventories (NIs)
- Network of National Focal Points (NFPs)  
links NIs ↔ EURISCO



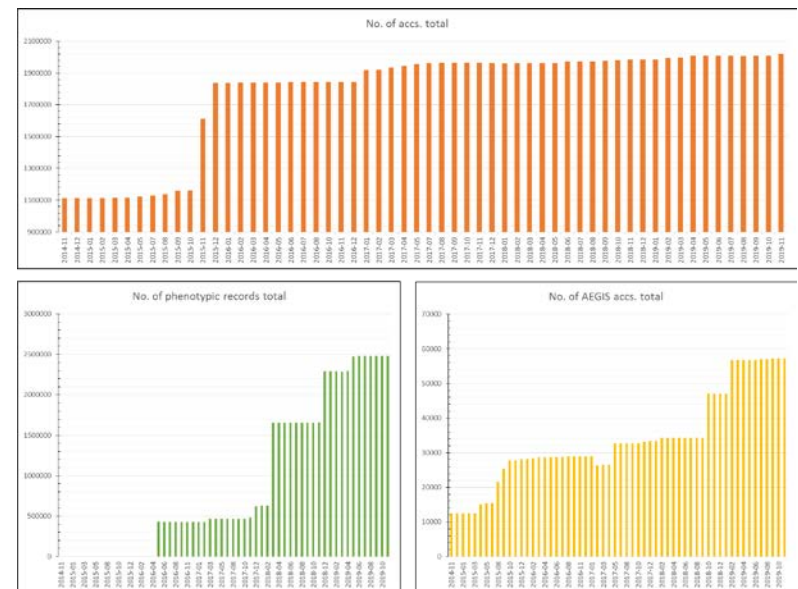
[https://upload.wikimedia.org/wikipedia/commons/8/81/Europe\\_countries\\_map\\_2.png](https://upload.wikimedia.org/wikipedia/commons/8/81/Europe_countries_map_2.png)

# Data flow



# Contents of EURISCO

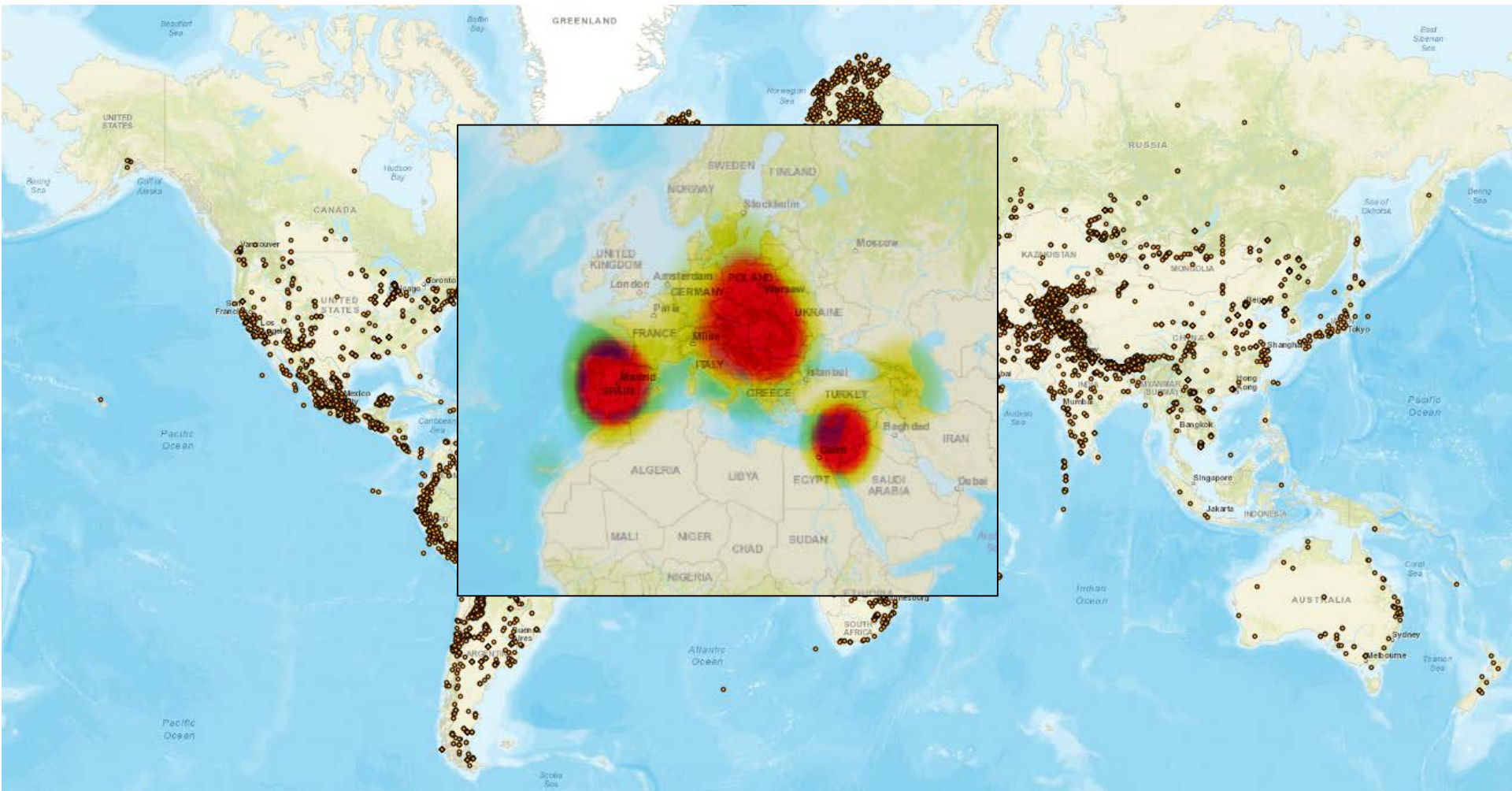
- 2,019,698 accessions
- 6,392 genera  
(including synonyms, spelling variants)
- 43,220 species names
- 444,360 MLS accessions
- 56,934 AEGIS accessions
- 60,500 DOIs



as of 2020-01-09



# Collecting sites



as of 2017-05-31

# Taxonomic composition

Genus	Species	No. accs.	Total
<i>Arabidopsis</i>	<i>thaliana</i>	684,964	685,188
	others	224	
<i>Triticum</i> (wheat)	<i>aestivum</i>	140,133	196,495
	<i>durum</i>	16,857	
	<i>turgidum</i>	14,860	
	<i>monococcum</i>	1,986	
	<i>spelta</i>	3,260	
	others	19,399	
<i>Hordeum</i> (barley)	<i>vulgare</i>	113,649	123,121
	<i>spontaneum</i>	6,164	
	others	3,308	
<i>Zea</i> (maize)	<i>mays</i>	65,560	65,686
	others	126	
<i>Phaseolus</i> (garden bean)	<i>vulgaris</i>	47,283	53,133
	<i>coccineus</i>	3,177	
	others	2,673	

Genus	Species	No. accs.	Total
<i>Solanum</i> (tomato, potato, eggplant, etc.)	<i>lycopersicum</i>	20,468	50,619
	<i>tuberosum</i>	14,912	
	<i>andigenum</i>	2,814	
	<i>melongena</i>	2,125	
	others	10,300	
<i>Vitis</i> (grape)	<i>vinifera</i>	35,335	41,902
	others	6,567	
<i>Avena</i> (oat)	<i>sativa</i>	33,561	41,774
	<i>sterilis</i>	2,203	
	<i>byzantina</i>	1,987	
	others	4,023	
<i>Pisum</i> (pea)	<i>sativum</i>	33,474	36,539
	others	3,065	
<i>Malus</i> (apple)	<i>domestica</i>	31,553	33,504
	others	1,951	
others			691,443
	Total		2,019,404

as of 2019-11-25



# EURISCO WEB

# Web interface



**EURISCO**  
Finding seeds for the future

Home News

Welcome to EURISCO

The European Search Catalogue for Plant Genetic Resources (EURISCO) provides information about 1.9 million accessions of crop plants and their wild relatives, preserved *ex situ* by almost 400 institutes. It is based on a network of National Inventories of 43 member countries and represents an important effort for the preservation of world's agrobiological diversity by providing information about the large genetic diversity kept by the collaborating institutions.

Between 2003 and 2014, EURISCO was hosted and maintained by Biodiversity International, Rome, Italy. Since 2014, EURISCO is being maintained at the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany. The central goal of EURISCO is to provide a one-stop-shop for information for the scientific community and for plant breeders. EURISCO contains both passport data and phenotypic data.

EURISCO is being maintained on behalf of the Secretariat of the European Cooperative Programme for Plant Genetic Resources (ECPGR), in collaboration with and on behalf of the National Focal Points for the National Inventories.

**How to obtain germplasm:**  
EURISCO does not provide the possibility to order accessions directly. The requests should be addressed to the holding institutions. More information can be found [HERE](#).

Search EURISCO

- Quick search
- Advanced search
- Export EURISCO data
- C&E data

EURISCO newsletter  
Subscribe / unsubscribe

Regions of origin

Statistical overview

- 1,961,985 Accessions
- 372 Institutes
- 43 Countries
- 6,317 Genera
- 42,974 Species
- 418,679 MLS accessions
- 34,364 AEGIS accessions
- 22,906 DOIs

Site rating

Your rating:

Submit

Average:

data of The Netherlands updated

data of Montenegro updated - New AEGIS accessions

data of the Czech Republic updated - New C&E data

National Inventory	Accessions
821,524	
200,717	
175,928	
4,025	
1,323	
271	
611	
136	
167	
85	
303,198	

Genus	Accessions
Arabidopsis	682,191
Triticum	189,104
Hordeum	121,589
Zea	61,849
Phaseolus	52,179
Avena	41,299
Solanum	38,944
Malus	31,875
Pisum	30,455
Vitis	30,049
other	682,451

Statistical overview of the composition of the EURISCO data. More detailed information can be found at the [statistics section](#).

Published online 31 August 2016

Nucleic Acids Research, 2017, Vol. 45, Database issue D1003–D1008  
doi: 10.1093/nar/gkw755

## EURISCO: The European search catalogue for plant genetic resources

Stephan Weise<sup>1,\*</sup>, Markus Oppermann<sup>1</sup>, Lorenzo Maggioni<sup>2</sup>, Theo van Hintum<sup>3</sup> and Helmut Knüpfer<sup>1</sup>

<sup>1</sup>Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) Gatersleben, Corrensstr. 3, 06466 Stadt Seeland, Germany, <sup>2</sup>Biodiversity International, Via dei Tre Denari 472/a, 00057 Maccarese (Fiumicino), Rome, Italy and <sup>3</sup>Centre for Genetic Resources, The Netherlands (CGN), Wageningen University and Research Centre, P.O. Box 16, 6700 AA Wageningen, The Netherlands

Received July 28, 2016; Revised August 19, 2016; Accepted August 21, 2016

### ABSTRACT

The European Search Catalogue for Plant Genetic Resources, EURISCO, provides information about 1.8 million crop plant accessions preserved by almost 400 institutes in Europe and beyond. EURISCO is being maintained on behalf of the European Cooperative Programme for Plant Genetic Resources. It is based on a network of National Inventories of 42

typic characterisation of genebank accessions, i.e. collecting information about traits such as disease resistance, drought tolerance and yield components. These data are usually generated on selected material, resulting in non-orthogonal, highly incomplete data sets. Nevertheless, the analysis of these data allows meaningful results, e.g. the identification of promising new alleles (5). Around the world, there are about 1800 genebank collections conserving PGRFA. Thereof, about 625 collections are maintained in Europe

53 (sub)versions since 2014

# Passport data search in EURISCO

- Four standard searches:
  - Taxonomy (incl. synonyms)
  - Accession
  - Biological status
  - Collecting site
- Advanced search
- Different user-specific export features

The screenshot displays the EURISCO website interface. At the top, the EURISCO logo is visible with the tagline "Finding seeds for the future". The navigation bar includes "Home", "About", "Search", "CSE data", "Statistics and documents", and "Imprint / Data Protection Policy". The main content area shows the "Passport data" for a specific accession. The "National inventory" section is expanded, showing details for the "Portuguese Bank of Plant Germplasm, Braga, Portugal". The "Taxonomy" section lists the Genus as *Brassica*, Species as *oleracea*, and Subtaxa as *var. acephala*. The "Collection" section provides details such as Collecting Number 38/2014 A, Collecting Date 2014-03-25, and Collecting Site Portugal, Guarda. A map shows the location of the collecting site in Guarda, Portugal. The "Donor", "Breeder", and "Other" sections are currently empty.

# Advanced search form

**eurisco**  
ECP GR Finding seeds for the future

EURISCO Intranet

Home About Search C&E data Statistics and documents Imprint / Data Protection Policy

Advanced search

The advanced search allows to freely combine all fields related to taxonomy, accession, status and site, respectively.

**Taxonomy**  
If you want to perform a search by scientific name, both genus and species are mandatory fields.

Genus: TRITICUM  
Species: MONOCOCCUM  
Species Authority: --- No (default) ---

**Accession**  
You can select up to five search terms per field.

Origin Country: ISRAEL (ISR) JORDAN (JOR) TURKEY (TUR)  
Holding Institute Code:  
Holding Institute Name:  
Crop Name:  
Accession Name:

**Status**  
You can select up to five search terms per field.

Biological Status: 100 (Wild)  
Acquisition Source:  
Storage Type:  
Acquisition Date From: Select date  
Acquisition Date To: Select date  
MLS Status: All statuses  
AEGIS Status: All statuses

**Site**  
You can select up to five search terms per field.

Latitude From: North  
Longitude From: East  
Elevation From:  
Collecting Date From: Select date

Latitude To: North  
Longitude To: East  
Elevation To:  
Collecting Date To: Select date

Search Reset



Version 1.5.3

**Taxonomy**  
If you want to perform a search by scientific name, both genus and species are mandatory fields.

Genus: TRITICUM  
Species: MONOCOCCUM  
Species Authority: --- No (default) ---

100 (Wild)  
110 (Natural)  
120 (Semi-natural/wild)  
130 (Semi-natural/sown)  
Weedy  
200 (Weedy)  
Traditional cultivar/landrace  
300 (Traditional cultivar/landrace)  
Breeding/research material

# User specific export – by species

EURISCO Intranet

Home About Search C&E data Statistics and documents Imprint / Data Protection Policy

Search Advanced search Export data by species Export data by National Inventory

Home > Search > Download by species

**Export EURISCO data by species**

*Hint: For performance reasons, the accessions from the Nottingham Arabidopsis Stock Centre (GBR140) are excluded from the dynamic export. However, these accessions are of course included in the full EURISCO dump.*

Genus \*  x

Species \*   x

National Inventory

**Filtered values**

Rows:  Actions:

1 - 5 >

NICODE	INSTCODE	ACCENUMB	GENUS	SPECIES	SPAUTHOR	SUBTAXA	SUBTAUTHOR	CROPNAME	ACCENAME	ACQDATE	ORIGCTY	SAMPSTAT	MLSSTAT	AGISSTAT
BGR	BGR001	1983-TRT-DI-8	Triticum	dicoccoides	(Koern. ex Aschers. et Graebn.) Schweinf.	var. pseudojordanicum	-	-	-	-	-	-	-	-
DEU	DEU146	TRI 18494	Triticum	dicoccoides	(Körn. ex Asch. & Graebn.) Schweinf.	convar. dicoccoides var. aaronsohnii	(Flaksb.) Percival	-	-	1999----	ISR	100	1	0
ARM	ARM035	1.AR.5	Triticum	araraticum	Jakubz.	-	-	wheat	-	1983----	ARM	-	-	-
ARM	ARM035	1AR50	Triticum	araraticum	Jakubz.	-	-	wheat	-	20110201	ARM	100	-	-
DEU	DEU146	TRI 18527	Triticum	dicoccoides	(Körn. ex Asch. & Graebn.) Schweinf.	convar. dicoccoides var. kotschyi	Jakubz.	-	-	1999----	ISR	100	1	0

1 - 5 >

0.60 s


**Download full dataset**

Downloading the whole dataset of EURISCO causes a very long page loading time. Thus, for performance reasons data from only one genus can be downloaded at once. A precalculated dump of the whole dataset (in EURISCO format) can be downloaded here:

[EURISCO dump \(MS Access format\)](#)  
[238.46 MB](#)  
[Created: 2019-11-21](#)

release 1.5.3

# User specific export – by NI

EURISCO Intranet

[Home](#) [About](#) [Search](#) [C&E data](#) [Statistics and documents](#) [Imprint / Data Protection Policy](#)

[Search](#) [Advanced search](#) [Export data by species](#) [Export data by National Inventory](#)

[Home](#) > [Search](#) > [Download by species](#) > [Download by National Inventory](#)

**Export EURISCO data by National Inventory**

*Hint: For performance reasons, the accessions from the Nottingham Arabidopsis Stock Centre (GBR140) are excluded from the dynamic export. However, these accessions are of course included in the full EURISCO dump.*

National Inventory \*

Genus

**Filtered values**

Rows

1 - 5 >

NICODE	INSTCODE	ACCENUMB	GENUS	SPECIES	SPAUTHOR	SUBTAXA	SUBTAUTHOR	CROPNAME	ACCENAME	ACQDATE	ORIGCTY	SAMPSTAT	MLSSTAT	AEGISSTAT
FRA	FRA015	RA 1126	Juglans	regia	L.	-	-	english walnut	Early Ehrhardt	19900000	USA	400	0	-
FRA	FRA015	RA 1117	Juglans	regia	L.	-	-	english walnut	Kasni Rodni	19890000	SRB	400	0	-
FRA	FRA015	FRA0411186	Zea	mays	L.	-	-	maize	sfp.15	-	FRA	411	1	-
FRA	FRA015	FRA0410648	Zea	mays	L.	-	-	maize	Lucgarier 2	-	FRA	300	1	-
FRA	FRA015	FRA0410616	Zea	mays	L.	-	-	maize	Saint Parthem.A	-	FRA	300	1	-

1 - 5 >

0.13 s

release 1.5.3

**Download full dataset**

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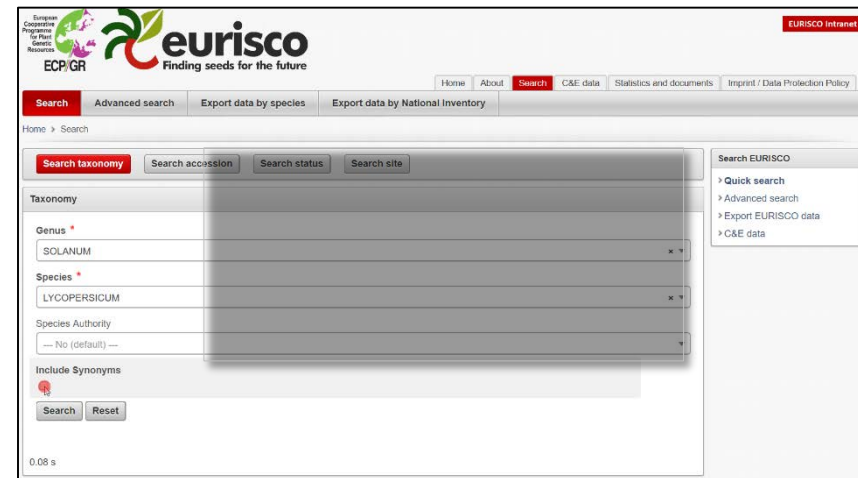
# Taxonomy search

- Challenges
  - Data from almost 400 institutes
    - Different taxonomic schools, opinions, traditions
    - No uniform scientific names, e.g. different author abbreviations
    - Misspellings
    - No curation in EURISCO (only by data provider) → DSA
  - Knowledge on data background needed for searches
- Improvement of taxonomic search
  - Identification of synonym candidates
    - GRIN, Mansfeld
    - + taxonomic terms accepted in EURISCO (based on user feedback)
  - Obtaining more complete search results
  - However, limited to available data!



# Taxonomy search

- Rework of the search interface
  - Allows to include synonyms
  - Shows the distribution of matching types
  - Significant performance improvement



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Plant Genetic Resources: Characterization and Utilization (2019) 47(6): 559–561  
doi:10.13171/251476262119000336

### Short Communication

#### Advancement of taxonomic searches in the European search catalogue for plant genetic resources

Stefanie Kreide\*, Markus Oppermann\* and Stephan Wisse\*  
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**Abstract**  
Genebanks play an important role in the conservation of global plant biodiversity. The European Search Catalogue for Plant Genetic Resources (EURISCO) was created as a central entry point to provide information on these collections. However, a major challenge lies in the heterogeneity of scientific plant names. This makes the selection of suitable plant material, e.g. for research or breeding purposes, significantly more difficult. For this reason, the taxonomic backbone of EURISCO has been completely revised. Search terms entered by users are now automatically checked against taxonomic reference repositories, allowing a variety of synonyms to be identified. In addition, a fuzzy search has been implemented, which makes the search function tolerant of erroneous data (e.g. caused by typing errors). Besides improvements of the search interface, more support will be given to EURISCO's data providers. The new developments provide a tool that makes it easier to identify problem cases within the data, such as accepted/non-accepted taxonomic names, and will successively improve the quality of taxonomic information in EURISCO.

**Keywords:** data integration, EURISCO, genetic community, plant genetic resources, taxonomy

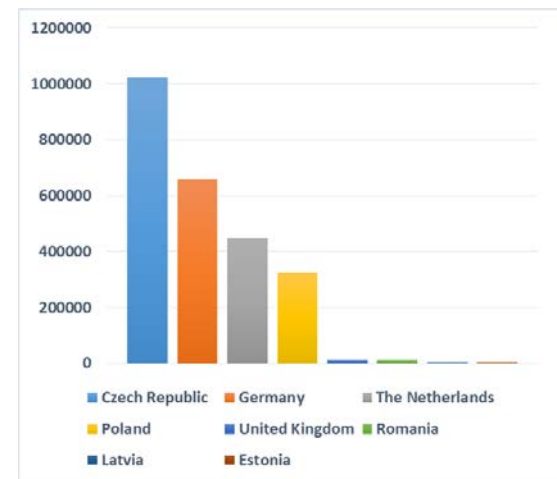
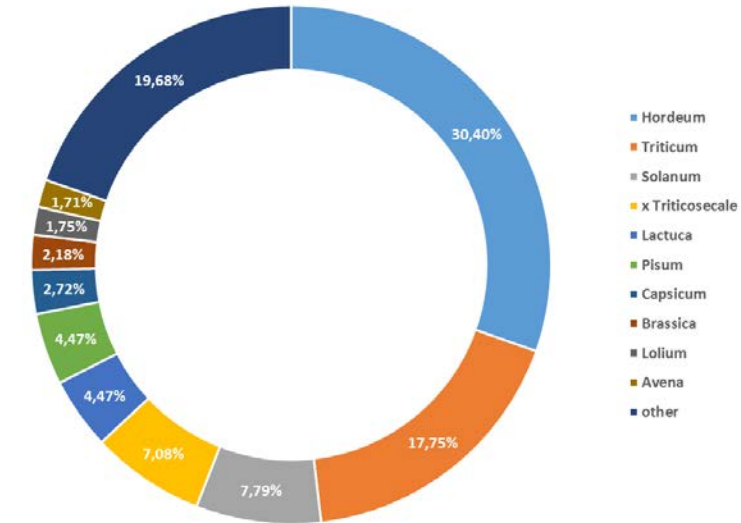
**Introduction**  
conserving PGRFA around the world, of which 625 collections comprising more than two million accessions are maintained in Europe (Engels and Muggast, 2012).  
Crop plants are a major source of human and animal nutrition (Graham and Dhillon, 2000), represent a hot spot of

National inventory report	Matches	Match distribution																																																		
1-15 16-19	Total number of selected accessions: 12309	<ul style="list-style-type: none"> <li>Exact Matches: 59%</li> <li>Fuzzy Matches: 40%</li> <li>Synonym Matches: 0%</li> </ul>																																																		
<table border="1"> <thead> <tr> <th>National Inventory</th> <th>No Of Accessions</th> </tr> </thead> <tbody> <tr><td>Armenia</td><td>397</td></tr> <tr><td>Azerbaijan</td><td>99</td></tr> <tr><td>Belgium</td><td>1</td></tr> <tr><td>Bulgaria</td><td>1321</td></tr> <tr><td>Estonia</td><td>22</td></tr> <tr><td>Germany</td><td>4177</td></tr> <tr><td>Greece</td><td>22</td></tr> <tr><td>Hungary</td><td>1943</td></tr> <tr><td>Israel</td><td>22</td></tr> <tr><td>Italy</td><td>30</td></tr> <tr><td>Latvia</td><td>14</td></tr> <tr><td>Lithuania</td><td>25</td></tr> <tr><td>Nordic Countries</td><td>83</td></tr> <tr><td>Poland</td><td>1241</td></tr> <tr><td>Romania</td><td>58</td></tr> </tbody> </table>	National Inventory	No Of Accessions	Armenia	397	Azerbaijan	99	Belgium	1	Bulgaria	1321	Estonia	22	Germany	4177	Greece	22	Hungary	1943	Israel	22	Italy	30	Latvia	14	Lithuania	25	Nordic Countries	83	Poland	1241	Romania	58	<p>Search term: Lycopersicon esculentum</p> <p>Total number of accessions (including misspellings and synonyms): 20773 accessions were found. 132 different taxa were detected.</p> <p>Synonym names were derived from GRIN taxonomy and Mandel taxonomy.</p> <table border="1"> <thead> <tr> <th>Select</th> <th>Taxon</th> <th>No Of Accessions</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/></td><td>Solanum lycopersicum L. subsp. galeni</td><td>1</td></tr> <tr><td><input type="checkbox"/></td><td>Solanum lycopersicum L. lycopersicum</td><td>11</td></tr> <tr><td><input type="checkbox"/></td><td>Solanum lycopersicum L. convar. esculentum</td><td>1</td></tr> <tr><td><input type="checkbox"/></td><td>Solanum lycopersicum L.</td><td>3771</td></tr> <tr><td><input type="checkbox"/></td><td>Solanum lycopersicum</td><td>1</td></tr> </tbody> </table>	Select	Taxon	No Of Accessions	<input type="checkbox"/>	Solanum lycopersicum L. subsp. galeni	1	<input type="checkbox"/>	Solanum lycopersicum L. lycopersicum	11	<input type="checkbox"/>	Solanum lycopersicum L. convar. esculentum	1	<input type="checkbox"/>	Solanum lycopersicum L.	3771	<input type="checkbox"/>	Solanum lycopersicum	1	
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# PHENOTYPIC DATA

# Phenotypic data

- Extension available since 2016
- Currently, 2,482,274 records of data from eight countries
  - Czech Republic
  - Estonia
  - Germany
  - Latvia
  - The Netherlands
  - Poland
  - Romania
  - United Kingdom
- 84,433 accs. with phenotypic data



as of 2019-11-25

# Phenotypic data search in EURISCO

Filter C&E data by genus

Genera \*  
 Brassica  
 Capsicum  
 Chondrilla  
 Cicorbita  
 Cucumis  
 Eruca  
 Ixeridium  
 Linum  
 Lupinus  
 Mycelis

Allium  
 Hordeum  
 Lactuca

Genus	Count
Lactuca	105,020
Solanum	77,663
Capsicum	50,736
Triticum	37,301
Hordeum	32,852
Brassica	27,355
Spinacia	17,913
Cucumis	17,460
Pisum	17,233
Linum	14,354
other	29,712

Wizard-based searches for

- Genus
- Species and trait
- Experiment
- Trait

Filter C&E data by species and traits

Genus \*  
 Lactuca

Species \*  
 Lactuca aculeata Boiss.  
 Lactuca altaica Fish. & Mey.  
 Lactuca biennis (Moench) Fern.  
 Lactuca homblei De Wild.  
 Lactuca raddeana Maxim  
 Lactuca saligna L.  
 Lactuca sativa L.  
 Lactuca sativa x serriola  
 Lactuca serriola L.  
 Lactuca tatarica (L.) C. A. Mey.

Lactuca canadensis L.  
 Lactuca dregeana DC.  
 Lactuca georgica L.  
 Lactuca perennis L.  
 Lactuca indica L.  
 Lactuca quercina L.

Traits \*  
 Leaf color intensity ((3=light, 5=medium, 7=dark[...]))  
 Leaf margin undulation (At harvest maturity[...])  
 Leaf shape ((1=narrow elliptic, 2=el., [...]))  
 Leaf shape ((1=round, 2=ovate, 3=obov[...]))  
 Leaf vein prickles ((1=not present, 9=present[...]))  
 Leaf vein prickles (-[...])  
 Leaf venation (At harvest maturity (1 = n[...]))  
 Nasonovia ribisnigri (Resistance to Nasonovia r[...])  
 Nitrate content (Mean nitrate content of t[...])  
 Pemphigus hirsarius ((1=very resistant, 2=resil[...]))

Filter C&E data by experiment

The report below lists all experiments, which contain characterisation & evaluation (C&E) data. Please use the search bar below to define filters.

Rows 10

Experiment Start Year between 1967 and 2012

1 - 10 of 782

Experiment Description	Dataset Remark	Experiment Start Year	Experiment End Year	Details
Sowing date = February 2, Planting date = April 17, IVT glasshouse XII, heated, soil culture, 2 stems, 4 plants per field, collection no. 567-659, experimentalist H. Roelofsan and G. Pet, standard = Bruinsma Wonder	Test data CGN	1980	-	<a href="#">contained traits</a>
Sowing date February 18, Planting date April 8, IVT glasshouse XII, heated, soil culture, 2 stems, 5 plants per field, collection no. 444-543, experimentalist L. de Groot and G. Pet, standard = Bruinsma Wonder				
Sowing date = March 15, Planting date = April 26, IVT glasshouse XII, heated, soil culture, 2 stems, 5 plants per field, collection no. 660-762, experimentalist L. de Groot and G. Pet, standard = Bruinsma Wonder				
Sowing date = February 28, Planting date = April 13, IVT glasshouse XII-IX, heated, soil culture, 2 stems, 5 plants per field, collection no. 763-869, experimentalists L. de Groot and G. Pet, standard = Bruinsma Wonder				
Sowing date = February 24, Planting date = April 18, IVT glasshouse no. XII, heated, soil culture, 2 stems, 5 plants per field, collection no. 871-934, experimentalists L. de Groot and G. Pet, standard = Bruinsma Wonder				
Sowing date = March 11, Planting date = April 26, IVT glasshouse XII, heated, soil culture, 2 stems, 5 plants per field, collection no. 935-981, experimentalist L. de Groot and G. Pet, standard = Bruinsma Wonder				
Sowing date = March 13, Planting date = May 1, IVT glasshouse II-I, heated, soil culture, 2 stems, 5 plants per field, collection no. 982-1021, experimentalist G. Pet, standard = Bruinsma Wonder				
Sowing date = March 20, Planting date = April 28, IVT glasshouse no. II-II, soil culture, 1 stem, 5 plants per field, collection no. 1476-1574, experimentalist G. Pet, standard = Sonatine				
Sowing date = January 31, Planting date = March 31, IVT Glasshouse no. 12-7, heated, soil culture, 2 stems, 5 plants per field, collection no. 33-65, experimentalist G. Pet, Standard = Claessee				
Sowing date = January 29, Planting date = March 28, IVT glasshouse no. 12-5, heated, soil culture, 2 stems, 5 plants per field, collection no. 1-111, experimentalist G. Pet, standard = Claessee	Test data CGN	1979	-	<a href="#">contained traits</a>

1 - 10 of 782

Traits in selected experiment

Rows 10

1 - 10 of 26

Trait Name	Trait Remark	Trait Method	Details
Fruit corrugation	-	(0=smooth, 3=slightly corrugated, 5=medium, 7=corrugated, 9=very corrugated)	<a href="#">scores</a>
Fruit attitude	-	Bruinsma Wonder=7 (1=very drooping, 3=drooping, 5=horizontal, 7=semi-erect, 9=erect)	<a href="#">scores</a>
Flower attitude	-	Bruinsma Wonders=7 (1=very drooping, 3=drooping, 5=horizontal, 7=semi-erect, 9=erect)	<a href="#">scores</a>
Mature fruit color	-	(A=dark red, B=light r, C=orange, D=salmon, E=canary, F=sulphur, G=green, I=brown, J=light orange, K=white, a=b=both in one fruit)	<a href="#">scores</a>
Tobacco mosaic virus	-	determined at natural infection (0=no symptoms, +=symptoms present)	<a href="#">scores</a>
Stem anthocyanin content	-	Bruinsma Wonder=3 (0=absent, 1=very little, 3=little, 5=medium, 7=much, 9=very much)	<a href="#">scores</a>
Fruit ribbing	-	(0=absent, 1=very little, ..., 9=very high)	<a href="#">scores</a>
Flower color	-	(A=white, B=filly-white, C=light green, D=light purple, E=dark purple, F=yellow, G=white/anthocyanin)	<a href="#">scores</a>
Fruit outerwall thickness	-	Measurement, 9=9mm or more.	<a href="#">scores</a>
Fruit cracking tendency	-	(1=none, 3=slight, 5=medium, 7=medium to severe, 9=severe)	<a href="#">scores</a>

1 - 10 of 26

0.12 s

# Example I – report of values

The screenshot displays the eurisco web interface. The top navigation bar includes 'Home', 'About', 'Search', 'CAE data', 'Statistics and documents', and 'Imprint / Data Protection Policy'. The main content area is titled 'Filter C&E data by species and traits' and shows filters for Genus (TRITICUM), Species (DURUM DESF., ISPAHANICUM HESLOT), and Traits (Plant - Height (cm) average height in centime...). A table of results is shown with columns: Experiment Description, Trait Name, CODE, INST, Species, ACCENUMB [%], Score, Score Link, Origin Country, Biological Status, and Details. A red arrow points to the 'Download' option in the 'Actions' dropdown menu for the first row.

Experiment Description	Trait Name	CODE	INST	Species	ACCENUMB [%]	Score	Score Link	Origin Country	Biological Status	Details
Field characterization an[...]	Plant - Height (cm) average h...	POL003	Triticum durum Desf.	27009	96.70	-		Morocco	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average h...	POL003	Triticum durum Desf.	27009	92.70	-		Morocco	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average h...	POL003	Triticum durum Desf.	27009	97.00	-		Morocco	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average h...	POL003	Triticum durum Desf.	27009	98.30	-		Morocco	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27019	104.30	-		-	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27019	107.00	-		-	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27019	112.70	-		-	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27019	96.30	-		-	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27021	107.00	-		-	Traditional cultivar/landrace	Accession details
Field characterization an[...]	Plant - Height (cm) average height in centime[...]	POL003	Triticum durum Desf.	27021	112.30	-		-	Traditional cultivar/landrace	Accession details

- Refine result
- Sort
  - Filter
  - Download

# Example I – report of experiments

- Refine result
- Sort
  - Filter
  - Download

eurisco  
Finding seeds for the future

Filter by species and traits | Filter by genus | Filter by experiment | Filter by trait

Home > C&E data > Search by species and trait

Filter C&E data by species and traits

Genus \* TRITICUM  
Species \* DURUM DESP. / SPANANCLUM HESLOT  
Traits \* Plant - Height (cm) (average height in centim...)

Apply | Reset

Show All | Scores for selected species and traits | Experiments with selected species and traits

Experiments with selected species and traits

The report below comprises all experiments, which contain at least one (not necessarily all) of the selected species/trait. When clicking on the link to the traits contained in these experiments, only those traits will be shown, which were used for scoring the selected species. Please use the search bar below to define filters.

Go Rows 10 Actions

1 - 10 of 38

Select Columns

- Filter
- Rows Per Page
- Format
- Flashback
- Reset
- Help
- Download

Filter

Filter Type @ Column

Column

Experiment Start Year

eurisco  
Finding seeds for the future

Filter by species and traits | Filter by genus | Filter by experiment | Filter by trait

Home > C&E data > Search by species and trait

Filter C&E data by species and traits

Genus \* TRITICUM  
Species \* DURUM DESP. / SPANANCLUM HESLOT  
Traits \* Plant - Height (cm) (average height in centim...)

Apply | Reset

Show All | Scores for selected species and traits | Experiments with selected species and traits

Experiments with selected species and traits

The report below comprises all experiments, which contain at least one (not necessarily all) of the selected species/trait. When clicking on the link to the traits contained in these experiments, only those traits will be shown, which were used for scoring the selected species. Please use the search bar below to define filters.

Go Rows 10 Actions

Experiment Start Year between 1977 and 1980

1 - 4 of 4

Experiment Description	Dataset Remark	Experiment Start Year	Experiment End Year	Details
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1977	1977	contained traits
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1978	1978	contained traits
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1979	1979	contained traits
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1980	1980	contained traits

1 - 4 of 4

5:22 h

release 1.4.3



# Example I – scores

The screenshot shows the EURISCO website interface. At the top, there is a navigation bar with 'Home', 'About', 'Search', 'C&E data', 'Statistics and documents', and 'Imprint / Data Protection Policy'. Below this, there are filter tabs: 'Filter by species and traits', 'Filter by genus', 'Filter by experiment', and 'Filter by trait'. The main content area is divided into two sections. The top section, 'Trait details', includes a 'Distribution of scores' donut chart and 'Descriptive statistics' for 'Plant - Height (cm)'. The statistics table is as follows:

Trait Name	Minimum	Maximum	Average	Stddev	Variance	First Quartile	Median	Third Quartile
Plant - Height (cm)	53.3	134	105.99	14.39	207.15	97.35	107.15	116.525

The bottom section, 'Accession scores for selected trait', features a search bar and a table with 10 rows of data. The table columns are: NICODE, INSTCODE, Species, ACCENUMB, Score, Score Link, Origin Country, Biological Status, and Details. A red arrow points from the 'Origin Country' column header to a dropdown menu in the adjacent image.

NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Origin Country	Biological Status	Details
POL	POL003	Triticum durum Desf.	27521	104.6	-	Portugal	Breeder's line	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27292	109.3	-	Spain	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27294	122.8	-	Poland	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27308	106.3	-	Spain	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27002	78.3	-	Italy	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27332	102	-	Portugal	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27019	104.3	-	-	Traditional cultivar/landrace	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27018	99.6	-	Italy	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27023	105	-	Tunisia	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27025	109.3	-	Portugal	Breeder's line	<a href="#">Accession details</a>

Descriptive statistics

This image shows a close-up of the 'Origin Country' filter dropdown menu. The menu is open, showing a list of countries: Argentina, Austria, Bulgaria, Canada, and Chile. A red arrow points from the 'Origin Country' header in the main screenshot to this dropdown. The dropdown also includes sorting icons (up/down arrows, list view, and menu view) and a search bar labeled 'Filter...'. The 'Bulgaria' option is currently selected and highlighted.

Additional filters, e.g. origin country



# Example I – scores

Group values

Accession scores for selected trait

Q Go Rows 10 Actions

Origin Country

1 - 10 of 166

Origin Country : Algeria							
NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Biological Status	Details
POL	POL003	Triticum durum Desf.	27515	114.6	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27430	98.1	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27325	106.6	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
Origin Country : Argentina							
NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Biological Status	Details
POL	POL003	Triticum durum Desf.	27141	116.3	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
Origin Country : Austria							
NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Biological Status	Details
POL	POL003	Triticum durum DESF.	27234	126.3	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum DESF.	27153	83.3	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
Origin Country : Bulgaria							
NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Biological Status	Details
POL	POL003	Triticum durum Desf.	27237	110.6	-	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27085	134	-	Traditional cultivar/landrace	<a href="#">Accession details</a>
POL	POL003	Triticum durum Desf.	27026	116.6	-	Traditional cultivar/landrace	<a href="#">Accession details</a>
Origin Country : Canada							
NICODE	INSTCODE	Species	ACCENUMB	Score	Score Link	Biological Status	Details
POL	POL003	Triticum durum Desf.	27243	117	-	Breeder's line	<a href="#">Accession details</a>

1 - 10 of 166

0.03 s

# Example II – trait selection

Search for trait of interest

lodging resistance

Go Rows 10 Actions

- All Columns
- Trait Name**
- Trait Remark
- Trait Method
- Trait Group
- Details

Trait Remark	Trait Method
-	µmol/100 g dry weight in s
-	µmol/100 g dry weight in m

EURISCO intranet

Home About Search C&E data Statistics and documents Imprint / Data Protection Policy

Filter by species and traits Filter by genus Filter by experiment **Filter by trait**

Home > C&E data > Search by trait > Experiments using trait

Experiments using selected trait

1 - 10 of 38

Experiment Description	Dataset Remark	Experiment Start Year	Experiment End Year	Details
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1977		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1978		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1979		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1980		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1981		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1982		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1983		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1984		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1985		<a href="#">scores</a>
Field characterization and evaluation of Triticum durum collection	This dataset contains Characterization and evaluation data of Triticum durum	1986		<a href="#">scores</a>

1 - 10 of 38

0.76 s

release 1.4.3

Search EURISCO

- > Quick search
- > Advanced search
- > Export EURISCO data
- > C&E data

Filter experiments containing the selected trait

# Example II – scores

eurisco Finding seeds for the future

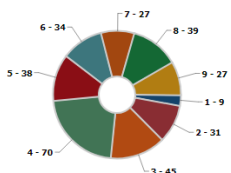
Home About Search C&E data Statistics and documents Imprint / Data Protection Policy

Filter by species and traits Filter by genus Filter by experiment Filter by trait

Home > C&E data > Traits in experiment > Trait details

Trait details

Distribution of scores



Descriptive statistics

Trait Name	Minimum	Maximum	Average	Stddev	Variance	First Quartile	Median	Third Quartile
Lodging resistance	1	9	5.08	2.24	5	3	5	7

Experiment description: Field characterization and evaluation of Triticum durum collection

Trait name: Lodging resistance

Trait method: Rating score from 1 (very sensitive) to 9 (very resistant)

Additional filters

Genus: -- All genera of selected trait --

Origin Country: -- All origin countries of selected trait --

Accession scores for selected trait

1 - 10 of 320

NICODE	INSTCODE	GENUS	ACCENUMB	Score	Score Link	Origin Country	Biological Status	Details
POL	POL003	Triticum	27223	9	-	France	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27221	3	-	Spain	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27219	8	-	Turkey	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27220	5	-	-	Breeder's line	<a href="#">Accession details</a>
POL	POL003	Triticum	27218	4	-	Union of Soviet Socialist Republics	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27216	2	-	Union of Soviet Socialist Republics	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27217	5	-	Greece	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27215	4	-	Austria	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27213	2	-	-	Breeder's line	<a href="#">Accession details</a>
POL	POL003	Triticum	27214	5	-	United States	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>

0.13 s

release 1.4.3

Create charts

Accession scores for selected trait

1 - 10 of 320

Actions





- Select Columns
- Filter
- Rows Per Page
- Format
- Flashback
- Reset
- Help
- Download
- Chart
- Group By
- Sort
- Control Break
- Highlight
- Compute
- Aggregate
- Pivot

NICODE	INSTCODE	GENUS	ACCENUMB	Score	Score Link	Origin Country	Biological Status	Details
POL	POL003	Triticum	27223	9	-	France	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27221	3	-	Spain	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27219	8	-	Turkey	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27220	5	-	-	Breeder's line	<a href="#">Accession details</a>
POL	POL003	Triticum	27218	4	-	Union of Soviet Socialist Republics	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27216	2	-	Union of Soviet Socialist Republics	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27217	5	-	Greece	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27215	4	-	Austria	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>
POL	POL003	Triticum	27213	2	-	-	Breeder's line	<a href="#">Accession details</a>
POL	POL003	Triticum	27214	5	-	United States	Advanced or improved cultivar (conventional breeding methods)	<a href="#">Accession details</a>

0.13 s

# Example II – scores

**Chart** [x]

Chart Type:    

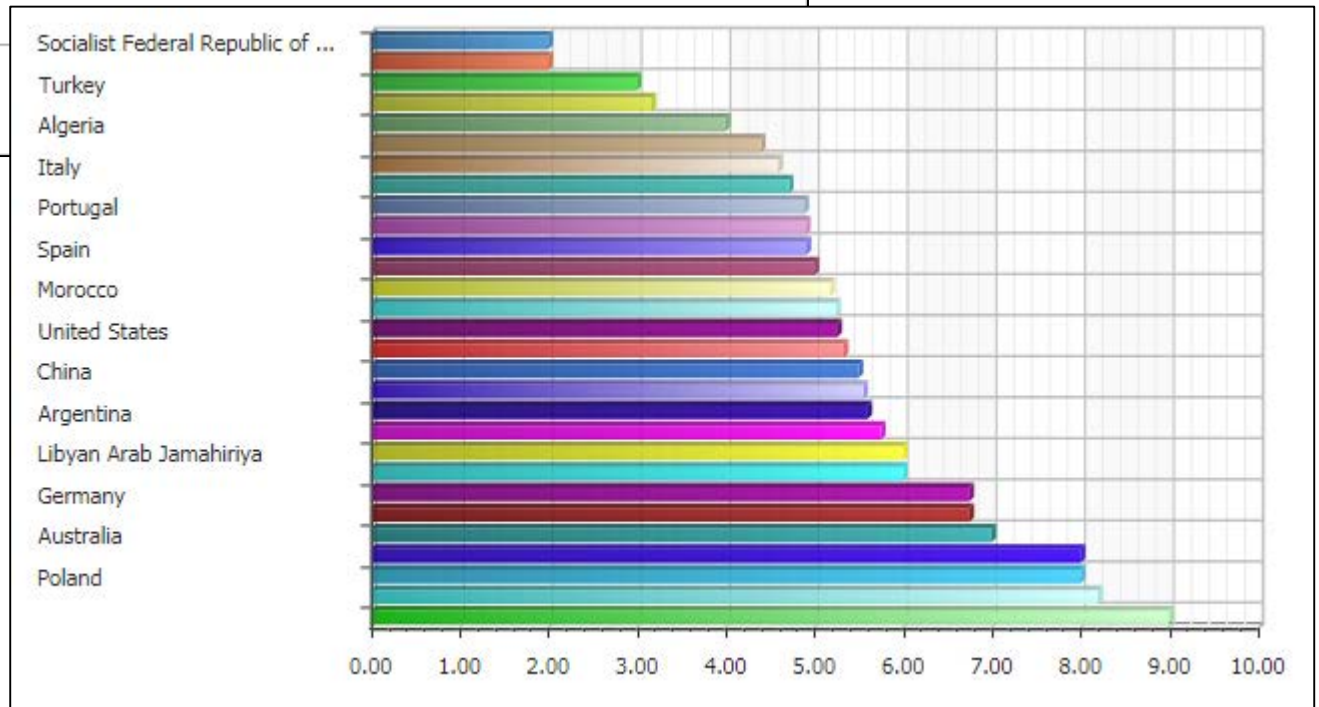
Label:  Axis Title for Label:

Value:  Axis Title for Value:

Function:

Sort:


Chart settings



# Phenotypic data search in EURISCO

## Download experiments

The report below provides the possibility to download whole experiments as MS Excel files, which contain the experiment description, the trait definitions as well as the phenotypic scores. Please use the search bar below to define filters.


 Dataset = 'Characterisation data (1946 - 2012) of barley accessions from DEU146'

1 - 10 of 65 >

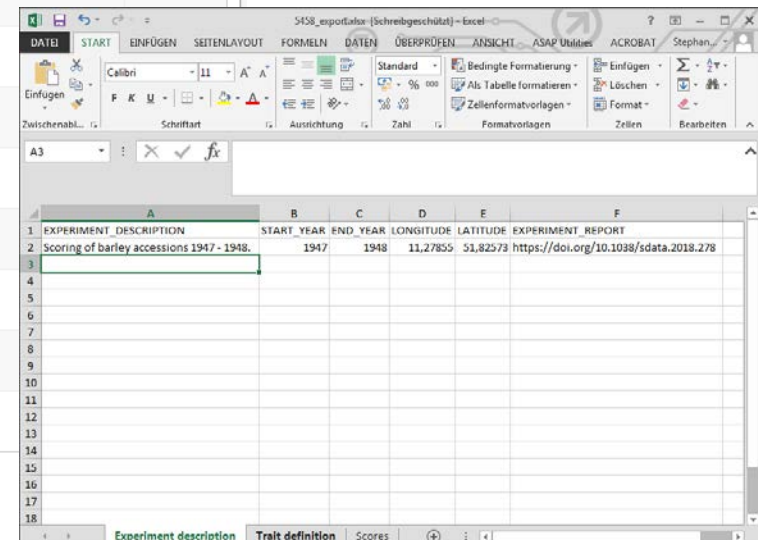
Dataset	Experiment	Start year ↑	End year	File created	Filesize (KB)	
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1945 - 1946.	1945	1946	2019-11-20	152.51	<a href="#">download</a>
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1946 - 1947.	1946	1947	2019-11-20	64.22	<a href="#">download</a>
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1947 - 1948.	1947	1948	2019-11-20	302.51	<a href="#">download</a>
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1948 - 1949.	1948	1949	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1949 - 1950.	1949	1950	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1950 - 1951.	1950	1951	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1951 - 1952.	1951	1952	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1952 - 1953.	1952	1953	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1953 - 1954.	1953	1954	2019-11-20		
Characterisation data (1946 - 2012) of barley accessions from DEU146	Scoring of barley accessions 1954 - 1955.	1954	1955	2019-11-20		

1 - 10 of 65 >

0.02 s

## Download of full experiments

- Experiment description
- Trait definition
- Scores



The screenshot shows an Excel spreadsheet with the following data:

EXPERIMENT DESCRIPTION	START_YEAR	END_YEAR	LONGITUDE	LATITUDE	EXPERIMENT REPORT
Scoring of barley accessions 1947 - 1948.	1947	1948	11.27855	51.82573	<a href="https://doi.org/10.1038/sdata.2018.278">https://doi.org/10.1038/sdata.2018.278</a>

The spreadsheet also shows tabs for 'Experiment description', 'Trait definition', and 'Scores' at the bottom.

# The challenge: Diversity of data

Lots of “standards” to express traits

- Different trait names/synonyms
- Different rating scales (nominal, ordinal, metric)

Different amounts of meta information

- When, where, how, by whom?
- Experiment set-up, treatment etc.

Different means of data management

- DBMS, flat files, mainly Excel files



# Current approach

- Data standardisation
    - No standardisation of trait, scale or experimental design
    - Pragmatic approach: Import of existing data as-is to reach critical mass
  - Data exchange
    - Only standardisation of exchange format
      - As simple as possible
      - As few fields as possible
    - “minimum consensus”
  - Data management
    - Highly abstracted, following the single-observation concept (van Hintum et al. 1992)
    - Omitting fine-grained metadata
- **Input of crop WGs needed**





# COLLABORATION

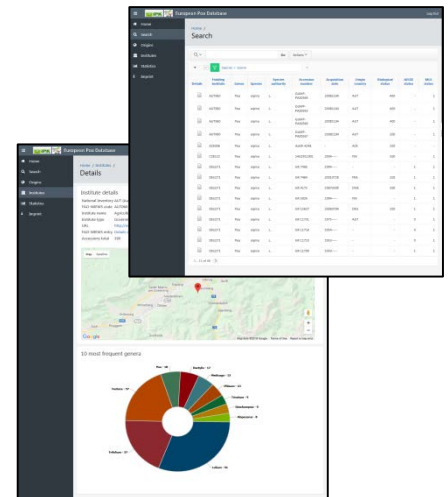
# Participation in project consortia

- Various ECPGR Grant Scheme Activities
- EUCLEG (Horizon 2020), 2017–2021
  - Coordination: INRA, France
  - Aim: reduction of protein import dependencies of both European and Chinese partners
  - Leader of work package for data management
    - Find data gaps in EURISCO (and try to close them)
    - Manage project data (passport, phenotypic, genetic)
- Farmer's Pride (Horizon 2020), 2018–2020
  - Coordination: University of Birmingham, U.K.
  - Aim: Development of network of *in situ* sites and stakeholders
  - Task leader: Preparation of a concept to extend EURISCO for *in situ* data
- GenRes Bridge (Horizon 2020), (2019–2021)
  - Coordination: European Forest Institute
  - Aim: Join forces of plant, forest and animal genetic resources
  - User training + information system linking
- ECPGR European Evaluation Network (initial funding BLE), 2019–2022
  - Coordination: ECPGR
  - Aim: Implementation of the evaluation network on wheat/barley and vegetable crops
  - Development of infrastructure
- AGENT (Horizon 2020), (2020–2025)
  - Coordination: IPK Gatersleben
  - Aim: Activate genebanks and facilitate access to plant genetic resources
  - Task leader: Data exchange and representation; infrastructure for managing and analysing genotypic and phenotypic data about genetic resources



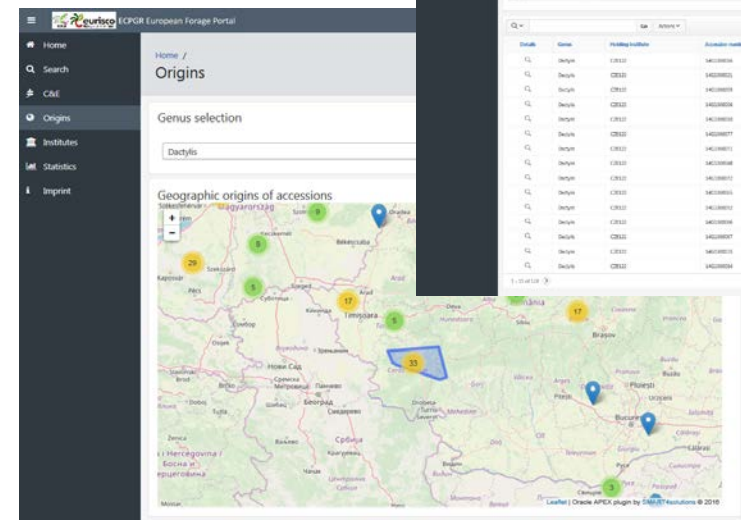
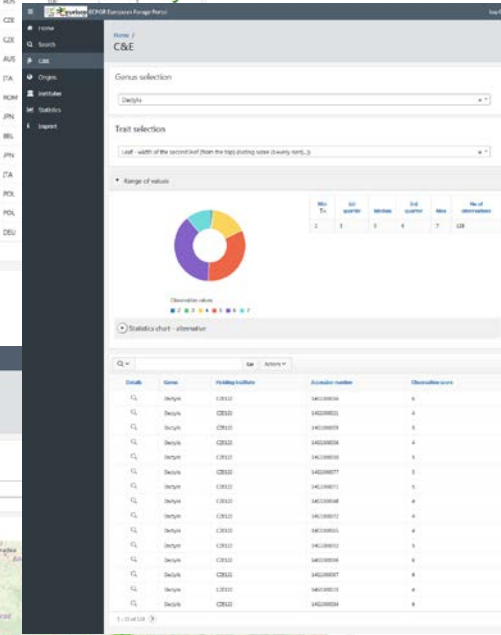
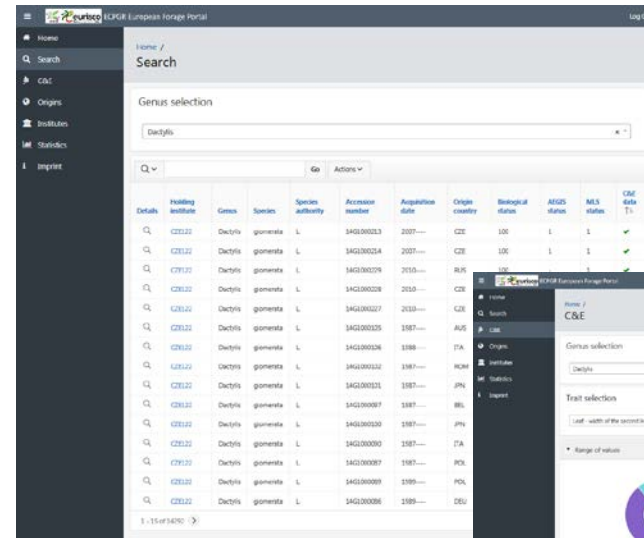
# Collaborations

- Genesys (Crop Trust)
  - Synchronisation of passport data
  - European hub for Genesys
- FAO-WIEWS
  - Synchronisation of passport data (non-regular)
- Germinate (JHI)
  - Close interlinking
- GLIS (ITPGRFA)
  - EURISCO provides a service for registering accessions for DOIs
- ECPGR crop working groups
  - Backend support for crop portals



# Support of ECPGR Central Crop Databases

- Cooperation with various crop WGs
- Example: European Forage Portal (Forage WG)
  - Browse
    - Passport data
    - Phenotypic data
  - Selection via map
  - Statistics
- Automatically updated from EURISCO
- Blueprint for other crop portals





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# THANK YOU FOR YOUR ATTENTION