



BETA WORKING GROUP

ACTIVITIES TOWARDS THE CONSERVATION AND UTILIZATION OF *BETA* GENETIC RESOURCES AND THE IMPLEMENTATION OF THE ECPGR OBJECTIVES



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(Chair of the *Beta* WG since 2015)

Lothar Frese
(Chair of the *Beta* WG till 2014)



BETANET Meeting
19-20 June 2018, San Servolo, Venice, Italy

International *Beta* Genetic Resources Network

Report of the International Workshop on *Beta* Genetic Resources, First Meeting, 7–10 February 1989, Wageningen, The Netherlands



Report of the International *Beta* Genetic Resources Workshop and World *Beta* Network Conference, Third Joint Meeting, 4–6 August 1993, Fargo, USA



1989

1991

1993

1996

Report of the International *Beta* Genetic Resources Network, Second Meeting, 24–28 June 1991, Braunschweig, Germany



Report of the International *Beta* Genetic Resources Workshop and World *Beta* Network Conference, Forth Joint Meeting, 28 February–3 March 1996, Izmir, Turkey

Beta Working Group

Report of a Working Group on *Beta*, First Meeting, 9–10 September 1999, Broom's Barn, Higham, Bury St. Edmunds, UK



Report of a Working Group on *Beta* and the World *Beta* Network, Third Joint Meeting, 8–11 March 2006, Puerto de la Cruz, Tenerife, Spain



1999

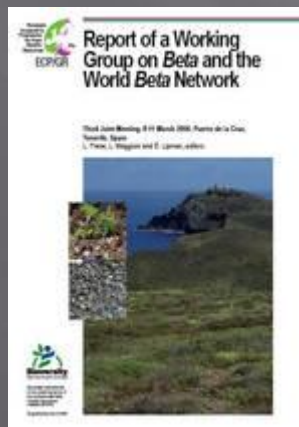
2002

2006

2012



Report of a Working Group on *Beta* and the World *Beta* Network, Second Joint Meeting, 23–26 October 2002, Bologna, Italy



Report of a Working Group on *Beta* and the World *Beta* Network, Forth Joint Meeting, 20–22 June 2012, Cappelle-en-Pévèle, France

Information on the current state of fulfilment of the ECPGR objectives related to individual objective of Phase IX

AEGIS (A European Genebank Information System)

- ▣ In the framework of the GeDiPa project the group contributed to the objectives of the ECPGR (recommendation of Most Appropriate Accessions-MAA and Most Appropriate Wild Populations-MAWP).
- ▣ The group assisted the French AKER project by providing expertise, information and accessions. By doing so, the link between genebanks and users was strengthened.
- ▣ The Crop-specific genebank standards for orthodox seeds for *Beta* and *Patellifolia* species were prepared and the FAO Genebank Standards for PGRFA were accepted.
- ▣ Although...

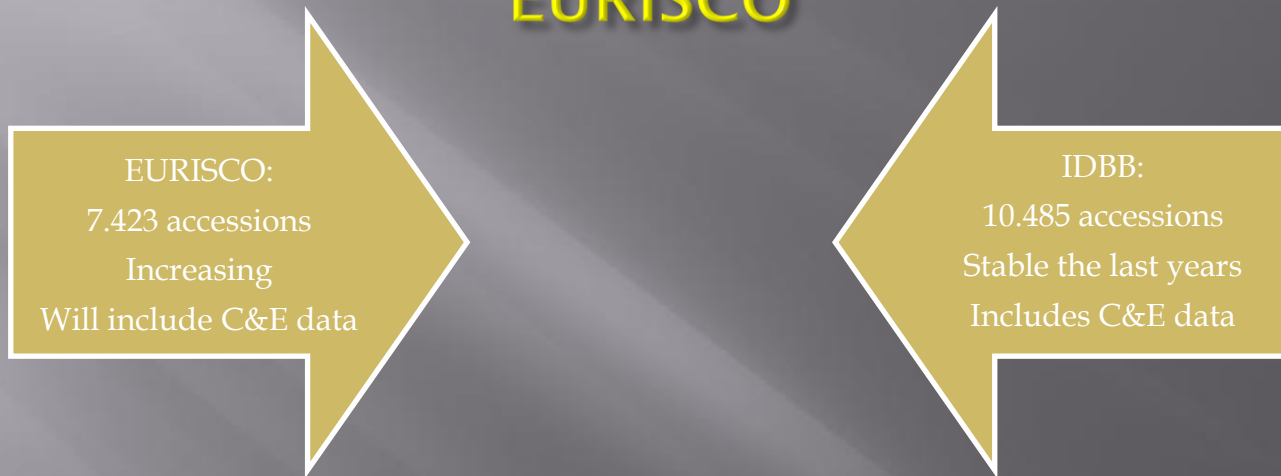
AEGIS

...
 from the 7.352
 accessions of
Beta sp.
 and the 71
 accessions of
Patellifolia sp.
 registered in
 EURISCO
 only few
 accessions
 are flagged
 for AEGIS.

Country	Participant		AEGIS	AM
Albania	1	N. Faslia	✓	✓
Armenia	1	A. Melikyan		
Austria	2	W. Kainz, P. Freudenthaler	✓	✓
Azerbaijan	1	V. Izzatullayeva	✓	✓
Belarus	5	S. Grib, D. Lushinskij, A. Vasko, S. Melentjeva, N. Lis	✓	✓
Cyprus	1	A. Kyratzis	✓	✓
Czech Republic	1	P. Hlásná-Čepková	✓	✓
Denmark	1	G. B. Poulsen	✓	✓
France	1	B. Desprez		
Georgia	1	G. Aleksidze	✓	✓
Germany	2	L. Frese, U. Lohwasser	✓	✓
Greece	2	P. Ralli, I. Karapanos		
Hungary	2	L. Horváth, L. Horváth Jr.	✓	✓
Ireland	1	D. Grogan	✓	
Israel	1	T. Fahima		
Italy	1	P. Stevanato	✓	✓
Lithuania	2	R. Karklelienė, B. Gelvonauskis	✓	✓
Poland	2	K. Kuzdowicz, M. Zaczyński	✓	✓
Portugal	4	B. M. Maçãs, M.C. Duarte, M. A. Pinheiro de Carvalho, H. Nóbrega	✓	✓
Romania	3	I. Gherman, S. Străjeru, D. Constantinovici	✓	✓
Russian Federation	1	V. Burenin		
Serbia	2	Ž. Čurčić, M. Ćirić, K. Taški Ajduković		
Sweden	4	J. Weibull, A. Palmé, A. Hägnfelt, K.-Å. Lundblad	✓	✓
Switzerland	3	M. Hardegger, C. Eigenmann, C. Kägi	✓	✓
Ukraine	1	S. Orlov	✓	
United Kingdom	2	N. Maxted, C. Allender	✓	✓
Total	26	49	20	18

Information on the current state of fulfilment of the ECPGR objectives related to individual objective of Phase IX

EURISCO

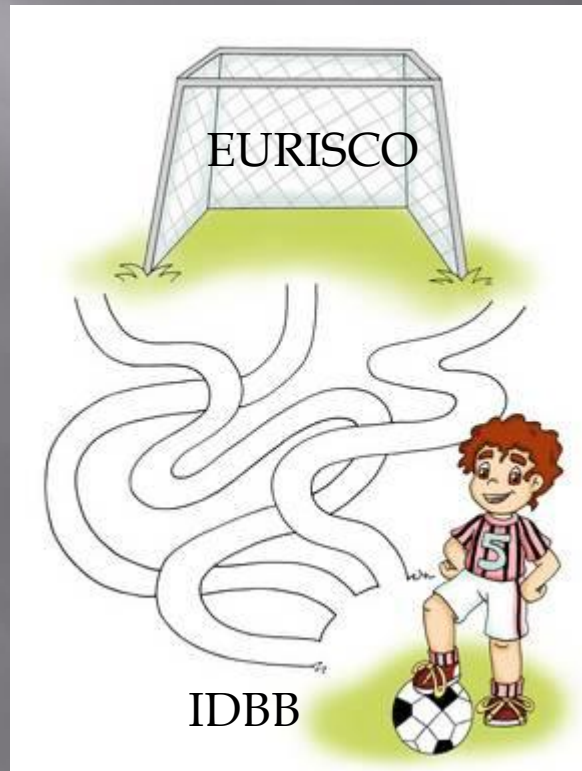


- It is necessary to include in EURISCO the data that are registered in the International Data Base for Beet (IDBB).
- The IDBB is an inventory of *ex situ* accessions maintained in an international, decentralized network of genebanks. This information system allows the search for passport, characterization and evaluation data on genebank accessions. The Julius Kühn-Institut (JKI) is still operating the IDBB.

So....

EURISCO plus

Characterization and evaluation data



... it is important to find the way to include IDBB data in EURISCO.

In situ and on-farm conservation Implementation of conservation and management of priority CWR

Activity Grant Scheme

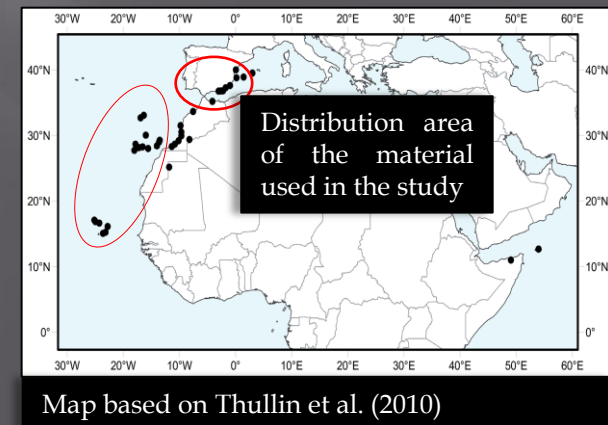
First Call (2014) Genetic diversity
of *Patellifolia* species (GeDiPa)

The purpose of this project was the improved
service for research and breeding through:

- (i) selection of MAWP as components of a
network of genetic reserves and
- (ii) selection of MAA for AEGIS.

Recommendation were given for:

- further collecting to close geographic gaps in
the European *Patellifolia ex situ* holding and
- selection of MAWP and MAA.



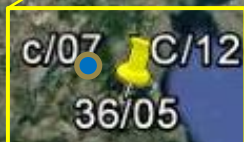
Map based on Thullin et al. (2010)

In situ and on-farm conservation Implementation of conservation and management of priority CWR

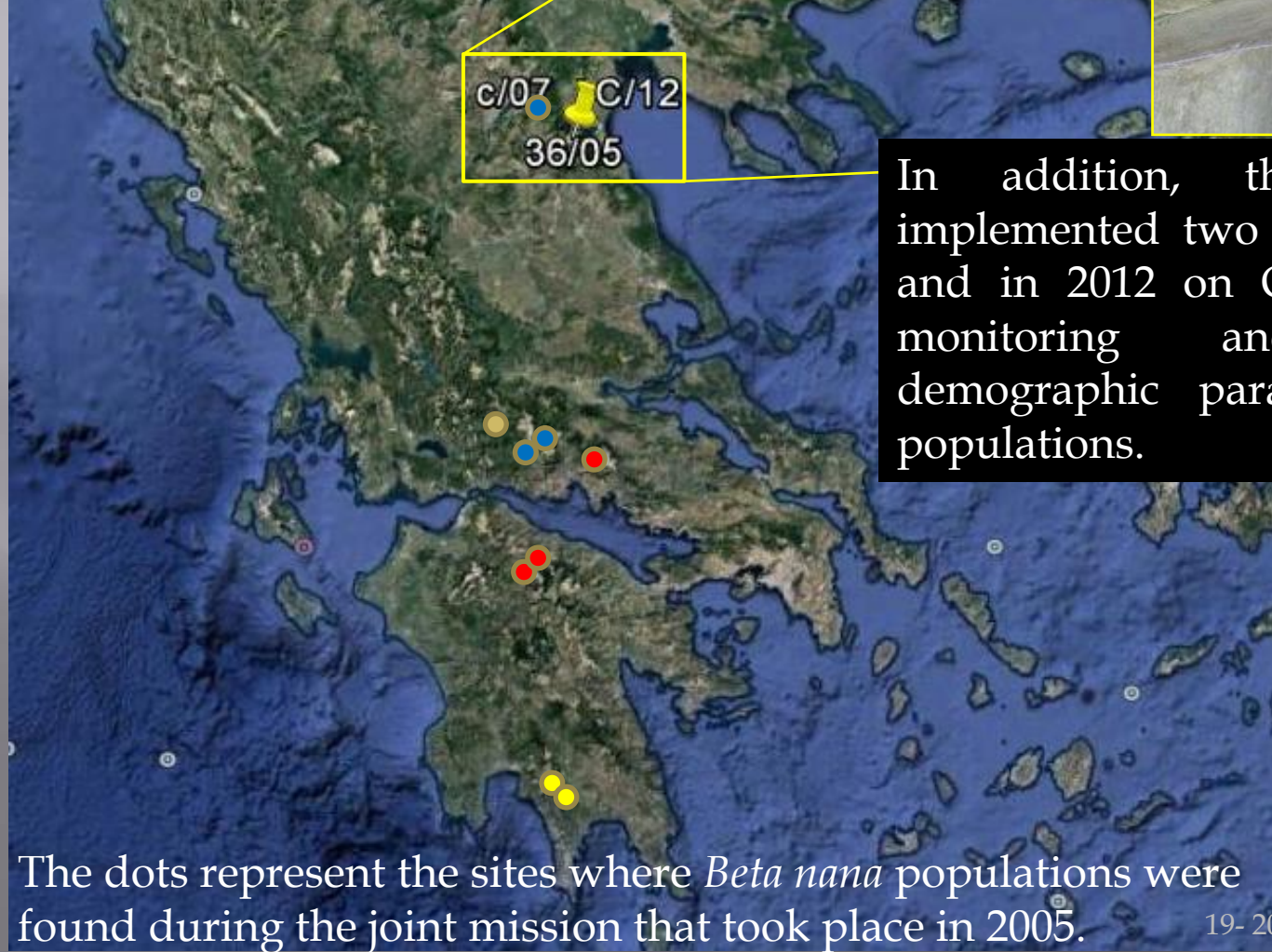
Beta nana project

Beta nana was on the agenda of the Working Group (WG) since 1999. The WG recommended to organize an *in situ* conservation project. In 2005, a joint (USA, GRC, DEU) plant exploration mission was conducted. The investigation of the genetic population structure in this alpine species has been completed by scientists of the USDA-ARS, recently. Model based assignment analysis found three main genetic lineages that may reflect biogeographical processes known to occur in the flora of the Balkan peninsula. These genetic clusters all overlap to some degree in an area in the centre of the species distribution. It is also in this region that most of the observed multilocus genotypes occur and where the set of most diverse individuals is located. This area may be suited for the establishment of a genetic reserve.

The project contributed to the ECPGR objectives and helped promoting the cooperation with non-European partners.



In addition, the Greek Genebank implemented two other missions in 2007 and in 2012 on Olympus Mountain for monitoring and recording the demographic parameters of the target populations.



The dots represent the sites where *Beta nana* populations were found during the joint mission that took place in 2005.

In situ and on-farm conservation Implementation of conservation and management of priority CWR

LIFE Recover Natura Project

The aim of this action was to establish a genetic reserve for *Beta patula* and increase the protection and conservation status of the Nature Reserve areas of the Ponta de São Lourenço Peninsula and the Desertas islands in the Madeira Archipelago.

In the framework of this project the following actions were taken:

- Evaluation of distribution and occurrence areas and population size of *Beta patula*,
- Implementation of measures promoting *in situ* and *ex situ* conservation of *Beta patula*,
- Establishment of a monitoring line to assess the impact of implement action on *Beta patula* population.

In situ and on-farm conservation Implementation of conservation and management of priority CWR

PGR Secure

During this project an analysis of CWR genetic diversity across the UK was undertaken and highlighted *in situ* and *ex situ* conservation priorities. This included working with Natural England to establish the first UK genetic reserve for CWR taxa on the Lizard peninsula. A priority taxon was *Beta vulgaris* subsp. *maritima*, which is now actively conserved on the Lizard and seed samples deposited in the Millennium Seed Bank.

CWRIS-AEGRO-PLIS / GenResIS

The Crop Specific Population Level Information System (CWRIS-AEGRO-PLIS) and the Genetic Reserve Information System (GenResIS) provide access to information on plant occurrences observed in the ecosystems and natural habitats where they had developed their distinctive properties.

Relations with users

AKER

The AKER project proposed to identify accessions that would contain rare alleles of interest to broaden the genetic diversity in elite germplasm. For this purpose a set of *Beta* section *Beta* accessions of diverse geographic origin was ordered from genebanks around the world. Dense molecular mapping and sequencing were carried out to help core collection selection and monitor diversity in order to estimate and exploit the available genetic diversity better.

Activity Grant Scheme

Third Call and Forth Call (2016) Improving a cooperation network between actors involved in conservation and utilization of *Beta* genetic resources (BETANET).

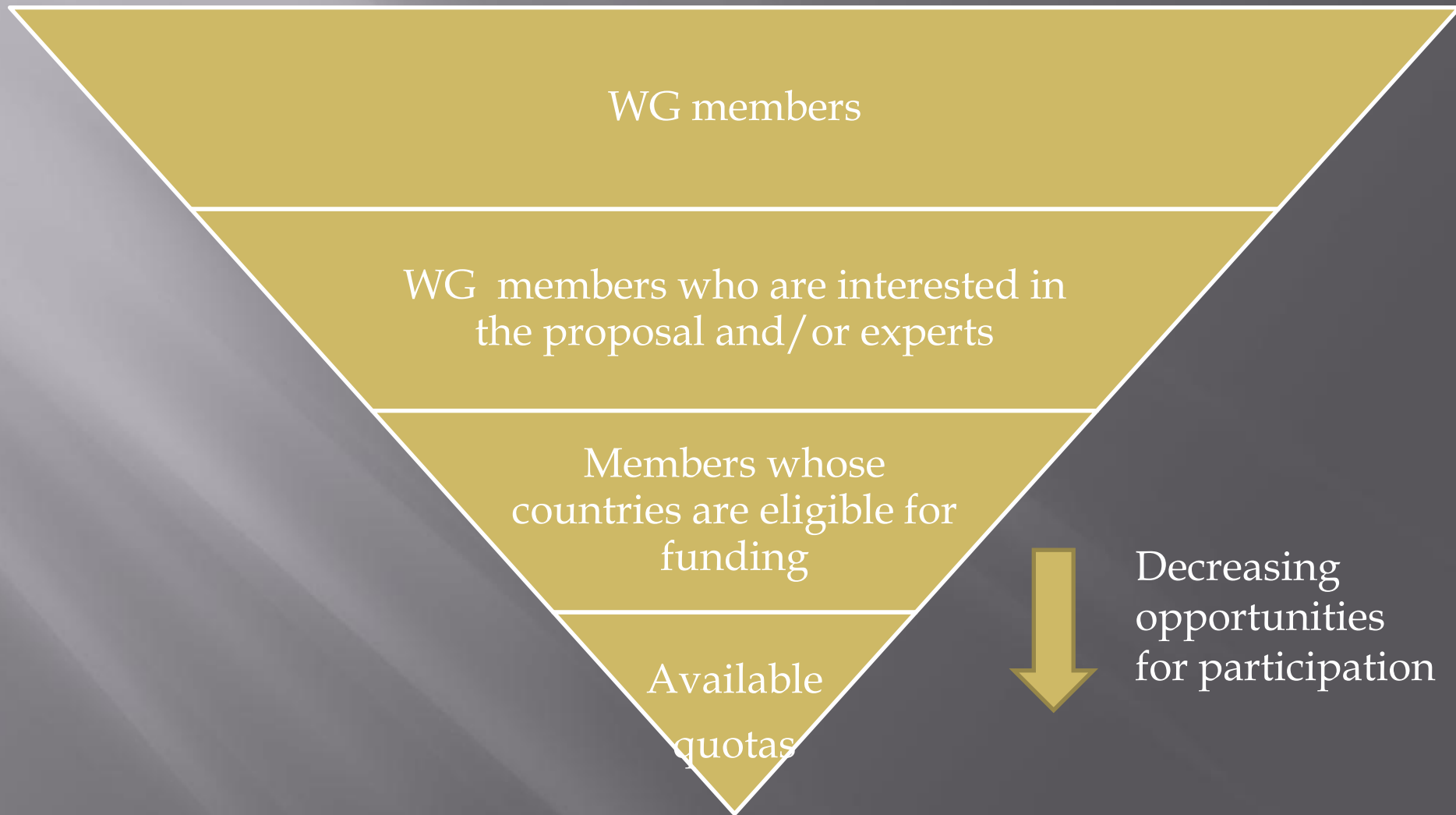
The purpose of this proposal is to renew, improve partnerships between genebanks, researchers, conservationists and farmers and to organize a meeting with a group of Working Group members and users from public and private sector to discuss, revise and decide on a work plan of the *Beta* group and on common activities that will strengthen their collaboration.

Information on positive development resulting from fulfilment of the objectives of ECPGR Phase IX or any major gaps /constraints identified in fulfilment of the objectives

All the above projects consist an evidence for the continued, engaged and trusting cooperation between partners of the network of *Beta* and have positive results to the fulfilment of the objectives of ECPGR .

Although there are some major constrains ...

Impact of ECPGR Activity Grant Scheme on participation of partners in joint actions

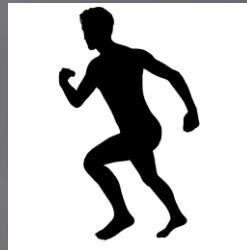


Funding Opportunities

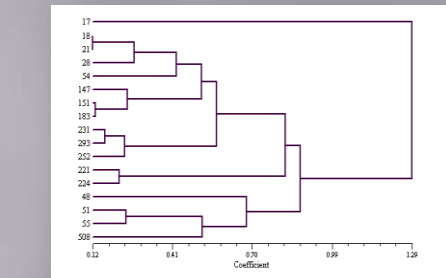
Considering the investment of time and money other funding opportunities seem to be more tempting.



On the one hand the members of the ECPGR WGs are busy to keep the wheels of conservation, evaluation and utilization of plant genetic resources rolling, through their activities in their countries and institutes...

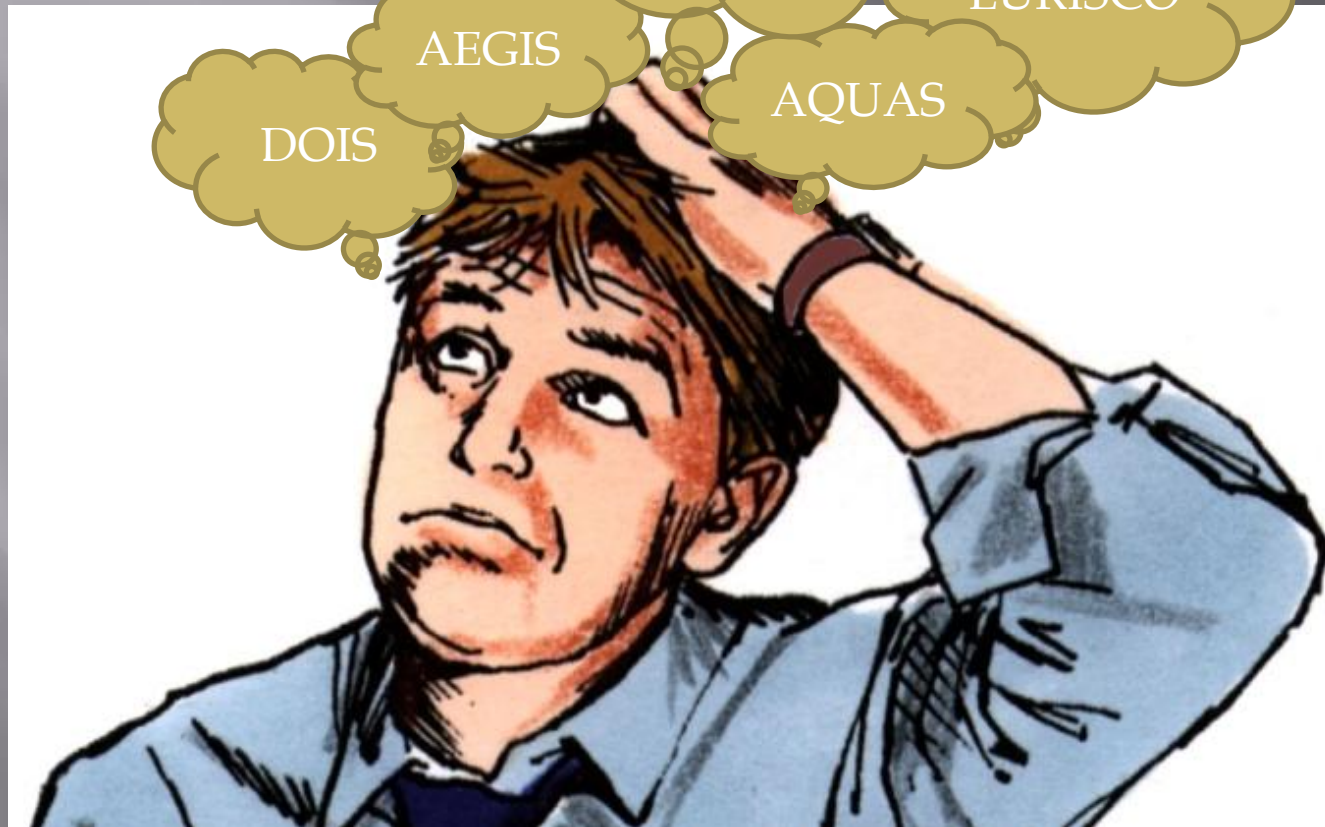


Set Priorities



... and on the other hand they have to keep in mind and be involved with the various ECPGR activities.

Set Priorities



Conclusion

For a fruitful and highly efficient Phase X of ECPGR, we have to consider the advantages and disadvantages of all the previous Phases, try to avoid the mistakes and keep the best elements that will contribute to the fulfilment of the objectives of ECPGR and to the benefit of plant genetic resources (PGR).

A close collaboration with all ECPGR members (Working Group Members and Chairs, Secretariat, Steering and Executive Committee, National Coordinators and Focal Points) is necessary for the implementation of the ECPGR activities and the enhancement of the conservation, evaluation, documentation and utilization of PGR .

Moreover, a strong network with non-ECPGR members, will facilitate the dissemination of knowledge and enhance the relationship and the collaboration between the PGR conservation communities and users.

Thank you for your attention!