



AEGIS in the making

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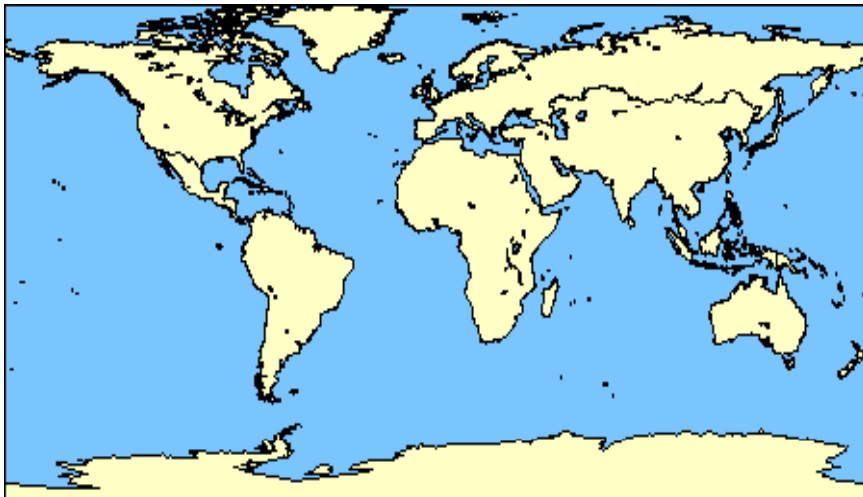


Content of presentation

1. Background and assessment
2. AEGIS for conservation
3. AEGIS for use
4. Some key features
 - Membership agreement
 - Organizational structure
 - European Collection (MAAs)
 - AQUAS
 - Information System (EURISCO)
5. Implementation status
6. Perspectives and conclusion

Background: collections

■ Worldwide



- > 1,750 genebanks
- > 7 million accessions
- Estimated 2 million unique

■ Europe



- app. 625 genebanks
- > 2 million acc.
- > 40 countries
- 30-40% unique (estimation)

Data from draft SOW II chapter on ex situ conservation



Background: legal

- Convention on Biological Diversity (1993)
- Global Plan of Action (1996)
- International Treaty on Plant Genetic Resources for Food and Agriculture (2004)

Background: Europe

European Cooperative Programme for Plant Genetic Resources (ECPGR)

- Since 1980
- EUCARPIA, FAO and UNDP as co-founders
- Europe wide; strong focus on cooperation
- Most major crops
- 18 ECPGR Crop Working Groups
- Provides home for AEGIS
- Coordinated by ECPGR Secretariat, Rome



Background: Europe – conservation

Difficulties reported in Europe to properly maintain PGR:

- Lack of long-term conservation facilities
- Insufficient safety-duplication
- Regeneration backlogs
- Inhomogeneous quality of material

Background: Europe – utilization

Difficulties reported on better utilization:

- Relative isolation of genebanks from user's community (missed opportunities for collaboration/communication)
- Germplasm insufficiently characterized/evaluated or data not made available
- Variable germplasm exchange conditions



Assessment: breeding related aspects

Recent developments in breeding world: (pers. comm. O. de Ponti, May 2009)

1. Increased “**industrialization**” of plant breeding (i.e. less but bigger companies; less public and more private sector engagement;
2. Increased **concentration of breeding companies** in fewer hands
3. Stronger focus on crops with **higher profit margin** and that can benefit - moneywise - from expensive investments in **novel (bio)technologies**;
—▶ less attention for OP grains, legumes and minor/NUS species
4. Strong preference for **Elite X Elite crossings**

—▶ More responsibilities on public sector to conserve and utilize germplasm, especially “minor” crops!



Assessment: breeding related aspects

Recent developments in breeding world: (pers. comm. O. de Ponti, May 2009)

5. Stronger focus on **specific traits** (novel genes and alleles through mining) and less on genetic diversity per se
6. **Bioinformatics technologies** developed to significantly improve the efficiency of such time and money consuming introgressions

—▶ need for reliable, well documented, characterized / evaluated, well structured and accessible collections



Assessment: survey of Pioneer genebank users' requirements - by D. Austin, 2009)

- Material with a certain specific trait (disease, insect, drought resistance)
 - Updated information and trait data on accessions already in possession
 - Clarification of nomenclature when lines have multiple name type across geographies
 - Pictures of multiple growth stages
 - Precise data (long/lat) on collection site and origin
 - Genotypic data with common set of markers
- ▶ need for reliable, well documented, well structured, accessible collections

Assessment: Documentation of European collections

16/62 ECCDBs have C&E data
(representing 63% of ECCDB accessions)

- 7 Vegetables
 - Brassica, Chicory, Eggplant, Lactuca, Minor leafy, Spinach, Tomato
- 4 Cereals
 - Avena, Barley, Maize, Wheat
- 3 Starch, Sugar
 - Beta, Potato cult., Potato wild
- 2 Fruits
 - Prunus, Vitis



Indicator for completeness of C&E data in Central Databases (D)

Optimal Value: $D = 1000$

$$D = \frac{\text{No. observations}}{\text{No. accessions} \times 85} \times 1000$$

Potato cultivars	160	Spinach	11
Minor leafy	72	Barley	8
Avena	61	Lactuca	5
Maize	54	Tomato	5
Beta	41	Wheat	1
Potato wild	37	Chicory	0.1
Vitis	37		

AEGIS for conservation

Setting up of AEGIS will ensure:

- Establishment and operation of an **effective and cost-efficient system**
- Conservation commitment **secured**
(long-term)
- Quality standards adequately **defined and raised**



AEGIS for use

Setting up of AEGIS will ensure:

- Quality and relevant germplasm and data
- Readily available selected accessions and information

THROUGH

Increased collaboration of countries/
institutions/stakeholders based on well-
defined shared commitments



Key features of AEGIS

1. Membership Agreement
2. Organizational structure
3. European Collection (MAAs)
4. Quality standards (AQUAS)
5. Information system (EURISCO)



Membership Agreement (MoU)

1. Long-term conservation commitment for registered European Accessions (EA)
2. Provision of access to material and information
3. Adherence to the AEGIS technical standards
4. Provision of “services” to AEGIS
5. Conclusion of agreement with all participating national institutions (Associate membership Agreement)

Organizational structure

Build on ECPGR institutional framework

- ECPGR SC provides “governance”
- AEGIS Advisory Committee provides oversight
- Important role + responsibilities for Crop WGs
- ECPGR Secretariat coordinates

Key role of member countries

- Identifying MAAs + services
- Build on capacity of (national) genebanks
- Coordinating role by National Coordinators
- Maintaining close contacts with users

European Collection (key principles)

- A virtual genebank
- Availability of accessions and information to *bona fide* users
- Central coordination (crop-wise), but decentralized management
- Technical guidelines to be established for each crop genepool

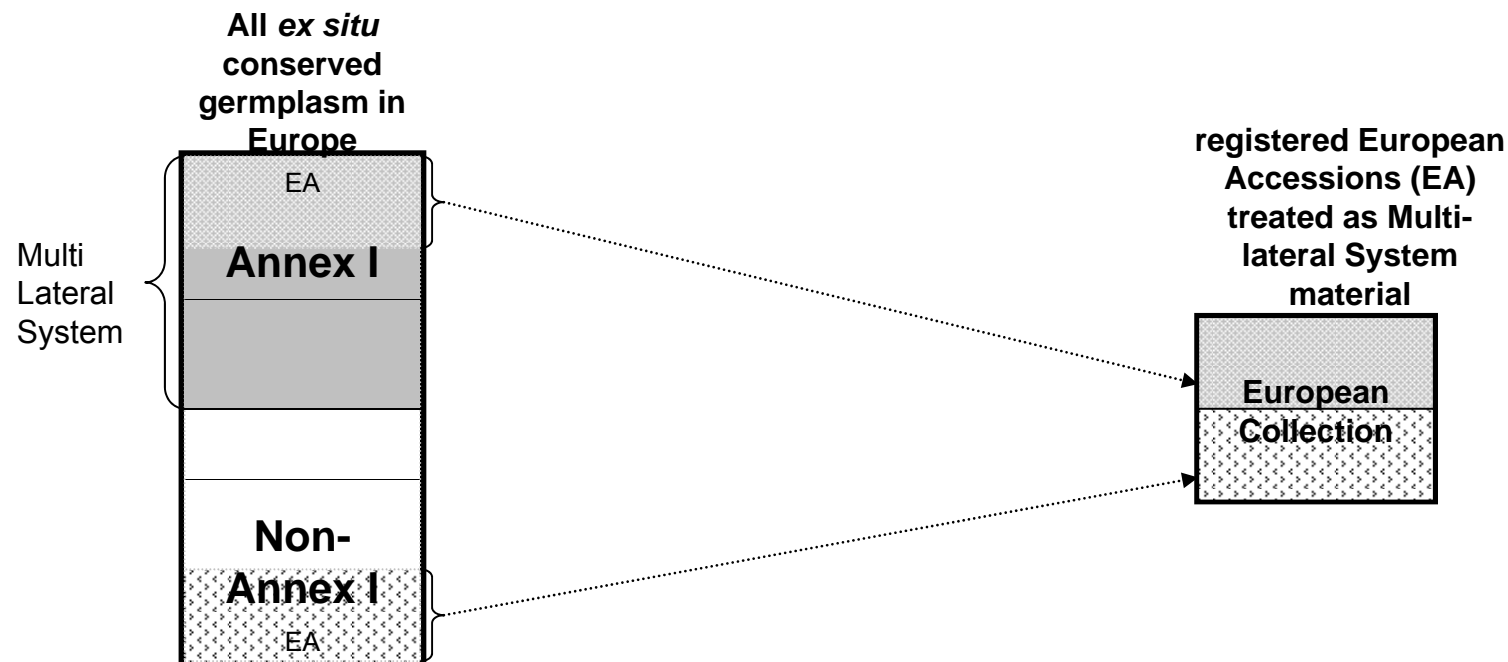


Scope of European Collection

- Material **under the management and control** of the member countries and their associate members, **in the public domain** and offered by the associate members for inclusion into AEGIS
- **Genetically unique** within AEGIS, to the best available knowledge (i.e. genetically distinct accessions; assessment based on available data and/or on the recorded history of the accession)
- **Plant genetic resources for food and agriculture** as defined in the International Treaty as well as **medicinal and ornamental** species
- **European origin or introduced** germplasm that is of actual or potential importance to Europe (for breeding, research, education or for historical and cultural reasons).



Creation of a European Collection = implementing IT





Transfer of germplasm

Standard Material Transfer

Agreement (SMTA) to be used for
the transfer of **Annex I crops**

AND of **Non-Annex I crops**, under
the same terms and conditions,
with explanatory note

AEGIS Quality System (AQUAS)

Quality assurance based on the principles:

- Say what you do
- Do what you say
- Let an independent body check that you do what you say
- Correct and improve what you say you do



AQUAS principles

- Consensus
- Agreed minimum standards
- Capacity building
- As little bureaucratic as possible
- Monitoring system (not police, but guiding and advisory approach)

Information system (EURISCO)

- European accessions will be identified in EURISCO



35*. AEGIS Status

(AEGISSTAT)

The coded status of an accession with regard to the European Genebank Integrated System (AEGIS).

Provides the information, whether the accession is conserved for AEGIS.

0 – not part of AEGIS

1 – part of AEGIS

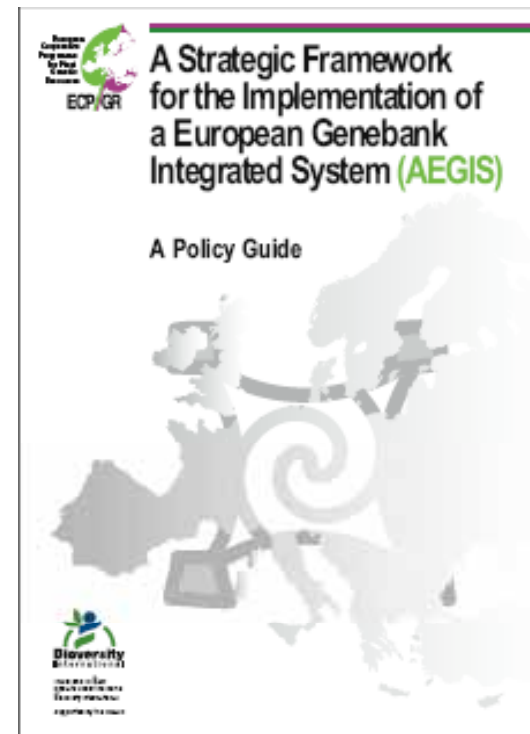
If the AEGIS status is unknown, the field stays empty

- Perspective to include Characterization and Evaluation data in EURISCO through formal process



Current implementation status of AEGIS

- Full agreement to establish a **European Collection** (Strategic Framework Paper)





Current implementation status of AEGIS

- Ongoing process to identify **European Accessions** (i.e. selection criteria) and **technical standards** for crops
- **MOU** in process of being signed (Albania and Ukraine are the first two members)

6. This Agreement will be deposited with the National Coordinator. A copy will be sent to the Executive Head (Director General) of the Organization responsible for providing the Secretariat services to the ECPGR. At the present time, the ECPGR Secretariat services are provided by Bioversity International.

Deputy Minister of Agriculture of Albania
 Signature and Date *[Signature]* 06.05.2009
 (Name and Position of Representative of the Institution)

Signature and Date *[Signature]* 06.05.2009
 (Name and Position of Representative of National Coordinator (country))

Ndoc Faris
National Coordinator
Albania

responsible for providing the Secretariat services to the ECPGR, or by signing a of this Memorandum of Understanding authenticated by the Executive Head (I General) of the Organization responsible for providing the Secretariat services I ECPGR as being a true copy.

Signatures and Date *[Signature]* 30.04.2009
 (Name and Position of Country Representative (country) or Representative (Regional Organization))



Current implementation status of AEGIS

- Perspective of significant **EU FP7 project** to be included in July call on research infrastructure

Perspectives: strengthening involvement of breeders in AEGIS

1. Representation on AEGIS Advisory Committee
2. Contribute germplasm to the European Collection
3. Participate in ECPGR/AEGIS meeting/activities in order to:
 - influence priority setting (e.g. traits for characterization/evaluation; standards);
 - to better exploit the potential of the diversity (e.g. engaging in genebank characterization/regeneration field plots)
4. Assume responsibilities (i.e. participate actively in regeneration/characterization/evaluation activities)



Conclusions

- Need for increased collaboration between public and private sectors to ensure:
 - sustainable future of conservation efforts through sharing of burden
 - adequate priority setting (types of crops; evaluation activities; traits; etc.) and avoidance of gaps/"forgotten" crops
 - getting the most out of the conserved germplasm



Thank you!

