

## **Meeting of the AEGIS model crops curators and database managers, 1-3 July 2008, Radzików, Poland**

### **Progress report of the AEGIS model crop: *Brassica***

#### **1. Introduction**

This report is based on discussions held during a meeting of the AEGIS model crops curators and database managers on 1<sup>st</sup>-3<sup>rd</sup> July 2008 in Radzikow, Poland. The Brassica Working Group was represented by Noor Bas (CGN), Charlotte Allender (Warwick HRI), with additional crop curators Ana Maria Barata (BPGV) and David Draper (UPM).

#### **2. Establishing selection criteria for the identification of the Most Appropriate Accessions (MAAs)**

At the VEGNET meeting in Olomouc in 2007, the Brassica WG discussed the criteria suggested by Jan Engels (draft 13 April 2007) and points were raised regarding the primary criteria (see below). In addition it was decided to test how the secondary criteria work in practice through a pilot study using the *Brassica rapa* accessions listed in the BrasEDB (2007 version).

##### **a. Recommended primary selection criteria**

Criteria for selecting Most Appropriate Accessions (MAAs) for AEGIS were discussed in the VEGNET meeting on the basis of the updated selection criteria compiled by Jan Engels (13 April 2007). The definition of the criterion “*genetically unique*” was discussed. Gert Poulsen and Charlotte Allender discussed molecular studies on diversity within and between accessions, which show that variation within accessions is too large to draw conclusions on “genetic uniqueness”. Therefore, it was concluded that at present molecular studies cannot be used in the identification of MAAs. Additionally, it was suggested that primary criterion 3 “*Agronomically (incl. research material) and/or historically/culturally important*” should also include “*genetically*” and “*educationally*” important. Regarding the criterion “*in the public domain*”, it was noted that this will probably raise problems for assigning MAAs in different countries, in relation to governmental policies. Lorenzo Maggioni explained that legal and political issues will be dealt with on the national level and that a collective Memorandum of Understanding, to be agreed and signed by the countries for AEGIS membership, will cover these issues.

##### **b. Comments on draft priority selection criteria**

As these criteria were put forward after the Olomouc meeting, they were not discussed in the network meeting.

##### **c. Recommended secondary selection criteria**

The Group agreed in Olomouc that the most important secondary criterion should be “*country of origin*” (with the criterion “*region/district*” included for landraces and wild material). Other secondary criteria were discussed and it was decided that a pilot study was necessary to detect problems and appropriately rank the criteria and/or to set up a decision tree for the selection of accessions. It was decided that this study will start with the identification of candidate MAAs for *B. rapa*, as this species includes a wide diversity of uses and the collections are medium-sized. This work was carried out independently and in parallel by Charlotte Allender and Noor Bas between

October 2007 and May 2008 and tested the relevance and robustness of the secondary criteria as drafted.

The same basic method was used in both instances:

- Most up-to-date version of BrasEDB used (2007 version)
- F1 hybrids disregarded
- Data were then split in two:
  - Accessions with names
  - Accessions without names
- Genetic uniqueness determined by accession name or other data
- Other primary criteria assumed to apply
- Geographic origin was priority for the secondary criteria
- Potential MAAs identified in each group
- Data recompiled and analysed

The results of the parallel studies in terms of % of *B. rapa* accessions selected as MAAs are shown below:

<b>% Selected as MAA</b>	<b>Analysis by Noor</b>	<b>Analysis by Charlotte</b>
<b>With ACCNAME</b>	57	72
<b>Without ACCNAME</b>	66	90
<b>Total</b>	60	78

The patchiness of the data meant that the decisions taken when applying the secondary criteria were subjective, and this led to the differences in the % of accessions selected as MAAs by the two people. Figure 1 below shows the number of accessions with data available for the most important passport descriptors for selecting MAAs.

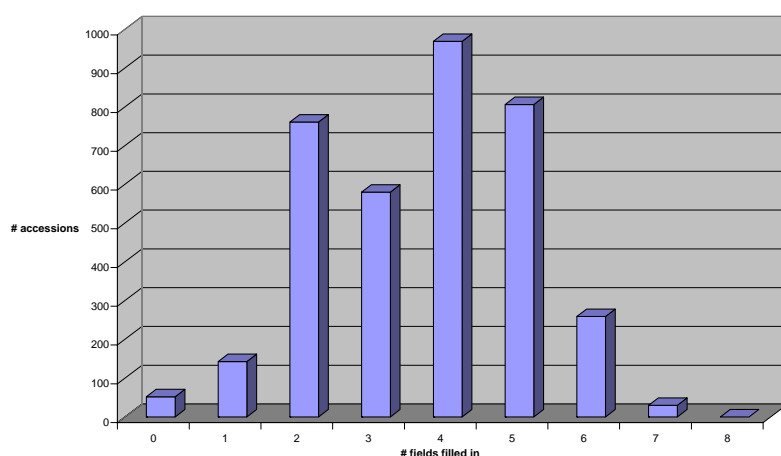


Figure 1. Number of accessions with number of following 8 descriptors filled in: ACCENAME, ORIGCTY, SAMPSTAT, COLLSITE, COLLNUMB, OTHERNUMB, DONORNUMB, DONORCODE

Based on these experiences a draft workflow was constructed for those accessions with accession name filled, see Annex 1. In this workflow the order of criteria, including some considerations on these criteria, on which decisions are to be taken are:

STEP 1: criterion for possible inclusion in AEGIS

- Amount of descriptors filled in
  - No decision yet taken on minimum number of descriptors and/or which descriptors should at least be filled

STEP 2: identification of duplicate groups

- Same or similar names
  - Taken into account different spellings, “sounds like” etc?
  - Decision yet to be taken in case of different extension after same name:
    - Gelria, Gelria A, Gelria B
    - King, King 14
- Synonyms
  - Information from EU variety list.
    - What to do with a variety, of which different synonyms exist, which is important in different countries?
- Check matches between accession-/collection-/donor-/other numbers, if information available

STEP 3: criteria to select within duplicate groups

- Held in the country of origin
  - What if origin country varies within duplicate groups?
- In core collection, or characterized/evaluated
- Most descriptors filled in

#### **d. General observations and comments on the process of developing the criteria and lessons learnt for other crops**

Insufficient data are available for many accessions of *B. rapa*, meaning that the secondary selection criteria cannot be applied in an objective, unequivocal manner. Collection holders will therefore need to be contacted to ensure that all available passport data are transferred to BrasEDB.

Information on subtaxa, and the coherence of this information within duplicate groups, has not been included in the criteria. This as for *B. rapa* the taxonomy is complex and there can be multiple uses.

It has been experienced that one year ago, for some collections the BrasEDB was more complete in relation to passport data than EURISCO. Therefore the database manager was hesitant to replace old data with more recent but incomplete passport data. Recently it has been observed that the completeness of data in EURISCO has been increased and that EURISCO can be used more often for updating the BrasEDB with recent accession data. However, it has been observed that more data in the remarks field are available in the databases of collection holders which are not included in the EURISCO.

A concern stays that Brassica collections from FRA, ITA, ESP, PRT and TUR are included in the BrasEDB, but not in EURISCO.

### **3. Establishing the list of MAAs**

#### **a. The procedure followed, including the respective roles of associated institutions, the countries (i.e. National Coordinators**

**plus), the Central Crop Database manager and the Working Group**

The associated institutions inform (i.e. via National Coordinators) the WG of the accessions to be considered as possible MAAs. The CCDB manager of the Brassica WG, together with experts will identify possible duplicate group and propose a list of potential MAAs to be considered by collection holders. The list will be constructed based on workflows, of which part of a draft is shown in Annex I. Collection holders will check the selection and availability of the potential MAAs and return the revised list.

**b. Generated list of MAAs (for the model crop in question and based on Central Crop Database)**

The final list is not available yet.

**c. Experiences with the use of the selection criteria while establishing the list**

See above.

**d. Lessons learnt for other crops**

Insufficient data might hazard the unequivocal establishment of a list of potential MAAs.

**4. Establishing the quality management system (QMS)**

**a. General observations on establishing a QMS for model crop**

It is recommended that AEGIS provides a body to implement a quality system and to monitor the generic standards.

We recommend a Quality Assurance System with as little bureaucracy as possible. All crop related activities will be internally audited by the respective collecting holders and reported to the WG. Within the WG, a coordinator needs to be designated for these tasks, who will seek assistance within the WG. External audits can take place, organized by the AEGIS ‘body’, preferably concerning multiple crops.

Proposed procedures, concerning crop related activities, include the following tasks for the Brassica WG and for the collection holders:

**a. Brassica WG**

- provide formats for protocols, “logbooks” and reports crop related activities
- Compiles reports and gives suggestions/coaching
- Discussions on reported problems and progress at Biennial WG meetings
- In case of recurrent problems, notifies the AEGIS “body”

**b. Collection holders**

- make available protocols in English concerning crop related activities
- record crop related activities and deviations in a “logbook”
- Every 2 years summary of activities etc to WG in report format

**b. Comments on the proposed principles and elements of the QMS (see discussion paper)**

We agree with the all principles as stated in the discussion paper.

According the elements see above.

**c. Recommendations on “generic” technical (genebank management) standards**

See annex 2. (table standards)

#### **d. Recommendations on crop specific technical standards**

See annex 2. (table standards)

#### **e. General comments and observations**

The standards follow previously published documents (Engels and Visser, 2003, FAO/IPGRI 2001, IPGRI /FAO 2004).

In order to reach a consensus on standards, the survey on present practices in gene bank management by European collection holders is proven useful. The results of this survey is summarised in Annex 2.

#### **5. Observations on the framework and tool for the assessment of operational costs for collection maintenance**

Genebank managers might find the framework and tool useful for assessing operational costs for collection maintenance in their institutions. In order to be able to calculate cost efficiency before and after AEGIS, the assessment of the “zero” situation for all AEGIS associated institutions is necessary. However this assessment is regarded not to be comparable between genebanks.

#### **6. Proposal on the involvement of all the relevant stakeholders of the European Region in establishing and operating the European Collection for model crop x (including on services to be provided; rationalization aspects; coordination; etc.)**

- The EU should provide financial and other support.
- Breeders/researchers/other crop experts outside the WG might be involved in advising different coordinators in the WG, i.e. in the selection of MAAs.
- in the VEGNET meeting it was proposed to set up contacts with breeders, research institutes/universities to be involved in regeneration, characterization and evaluation of future AEGIS accessions..

#### **7. Proposed “general workplan”, whenever possible costed, for the model crop x Working Group activities**

In the sequence of the last meeting Olomouc it was decided to start the implementation of Brassica model crop focused on *B. rapa*.

For implementing AEGIS *B. rapa*, specific coordinators need to be designated, who will seek experts in the WG to coordinate different activities.

The following activities and estimated costs (*for B. rapa*) are:

Database manager:

- Assess and improve quality of passport information
  - 2 person months
- Proposing, discussing, drawing up list MAAs
  - 3 person months

Conservation coordinator

- Drawing up a crop conservation workplan (see Appendix ! in AEGIS – Discussion paper
  - 3 person months

Quality system coordinator

- Drawing up and distributing formats for protocols, “logbooks”, reports.

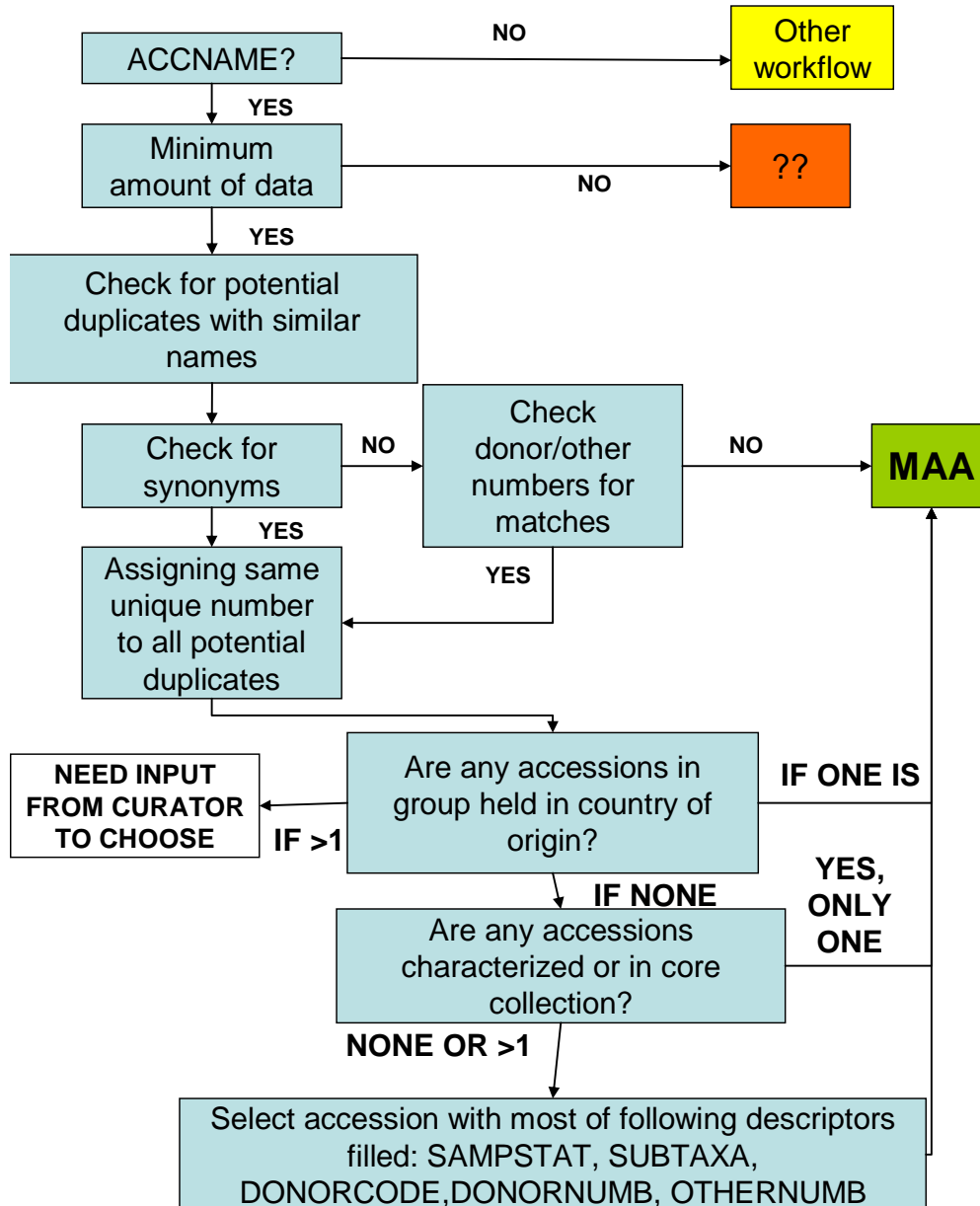
- 2 person months

This plan is based on the following assumptions:

- Input curator, WG members, Focal point (NC) from national programmes
- Costs updating genebank databases, upgrading genebank facilities, regenerations, distribution etc. are financed by national programmes
- No extra costs needed for existing genebank facilities and human resources compared to pre AEGIS
- AEGIS provides a body, at a coordinating level to implement a quality system and monitor the generic standards.
- EURISCO includes all collections,
  - National Coordinators
    - ensure relations with WG members and genebank curators
    - find extra resources for national programmes
  - AEGIS/ECPGR finances working group meetings (every 2 years) to:
    - Evaluate and update list MAA's
    - Evaluate and update crop conservation workplan
- Costs characterisation/evaluation financed by EU/AEGIS on project basis.

ANNEX 1: Draft workflow for selection of MAA's for *Brassica rapa* with ACCENAME

# MAA's Brassica criteria workflow



## ANNEX II

**Table 1. DRAFT Minimum and recommended standards in collection management procedures for cultivated species.** July 2008

Generic standard in yellow; standards which are both crop specific and generic in blue; crop specific: no color

	Present practice	Minimum standards	Recommended standards
Passportdata	No minimum – varying range	INSTCODE ACCENUMB ACCENAME (breeding material only) GENUS SPECIES “cultivargroup” ORCNTY DONOR SAMPSTAT	All EURISCO descriptors
Documentation of germination% in database	60% of collectionholders	Yes	This information continuously to “EURISCO”
Documentation of seed quantity in database	90% of collectionholders	Yes	This information continuously to “EURISCO”
Field doc +/- AEGIS		Yes	Yes
Number of seeds germination test	50 - 200	2 x 100	
Moisture content seed base and active	3 – 10%	3-7%, consult publications	
T. storage base samples	85%: ≤ -18 ° C	≤ -18 ° C	
T. storage active samples	Most: - 5 - + 5 ° C	≤ +4 ° C	- 18 ° C
Monitoring and alarmsystem	Most monitor, 50% alarmsystem	Both: yes	
Backup power unit and regular check	70% have unit of which 60% test regularly	Both: yes	
Safety duplication	10 – 100% of collections	In another location	In another country
Quality System	30% yes or developing or planned; 70% no	Yes, audited by ECP/GR WG	Certification
Protocol of all collection management activities	33%yes, 33% in preparation, 33% no	Yes, in English	



Use of logbook for regeneration, monitoring conditions and checking	33% of collectionholders	Yes	
Registration deviations from protocol in database	33% of collectionholders	In non public field for management reasons; reported to WG	
Hybrids?	From BrasEDB: included in most collections	At present no, discussions later	
Number of seeds base	Number of seeds for inclusion in collection: no minimum – 100.000 seeds	1000 for regeneration 1000 for monitoring germination	
Number of seeds active	Number of seeds for inclusion in collection: no minimum – 100.000 seeds	3000, more dependant on species	
Number of seeds safety duplication	Not asked in survey	500	2000
Interval monitoring	2 – 30 years	Depending initial germination, ask experts	
Minimum initial germination	No minimum/ 60 – 90%	Depending on crop yet to be decided	90%
Criteria regeneration, quality	Low germination/ 50-85%	Germination < 65%	Germination < 75%
Criteria regeneration, quantity	<500 – 3000 seeds	Seed active < 1000	
Number of plants in regeneration	20 - 100	30, less when individual harvesting	100, less when individual harvesting
isolation	Cages/50 – 500 m	Cages or 800 m distance (GMO problem)	
Checking identity	Morphologically by 30% of collectionholders	Yes: 5 plants of 2 generations	Yes: 30 plants of 2 generations
DNA Samples taken from accession	Not asked in survey		
Avoiding contamination GMO's	Not asked in survey	Awaiting EU recommendations	
Hybrids?	From BrasEDB: included in most collections	At present no, discussions later	