

Report of a Working Group on *Prunus*

Eighth Meeting, 7-9 September 2010, Forlì, Italy
L. Maggioni, M. Lateur, E. Balsemin and E. Lipman





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Diversity in the French National Collection of garden plum (*Prunus domestica* L.). Courtesy of © E. Balsemin, INRA-UREF, Villenave d'Ornon, France.

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Related presentations can be downloaded from
http://www.ecpgr.cgiar.org/workgroups/prunus/Presentations_Prunus_8.htm

SUMMARY REPORT OF THE MEETING

Introduction

Welcome by the local organizers and opening remarks

Daniela Giovannini welcomed the participants on behalf of the Fruit Crop Research Unit of Forlì and was pleased to host the Eighth Meeting of the Working Group on *Prunus* in Emilia-Romagna, a leading and traditional producer of peach, plum, strawberry and pear.

Daniela Benediková, interim Chair of the Working Group (WG), welcomed the participants and thanked the local organizers. Since many country delegates were new to the Group, D. Benediková suggested that the participants introduce themselves.

Update on ECPGR

Lorenzo Maggioni, ECPGR Coordinator, updated participants on the status of the European Cooperative Programme for Plant Genetic Resources (ECPGR) during the ongoing Phase VIII (2009-2013). The main decisions of the previous Steering Committee meeting held in 2008 were summarized, including the priorities for Phase VIII (sharing of responsibilities being the top one), the available budget and the planned meetings and actions of the Fruit Network. The current status of the European Plant Genetic Resources Search Catalogue (or European Internet Search Catalogue, EURISCO) with its data on more than 1 million accessions from 41 countries was described. The recent possibility for the countries to indicate their designated Multilateral System accessions in EURISCO was highlighted, showing that over 212 000 European accessions had been so far designated by 13 countries. The Documentation and Information Network of ECPGR has developed a concept to include non-standardized characterization and evaluation data into EURISCO. The intention is that EURISCO will contribute its data to the global information system that is being developed at Bioversity with funds from the Food and Agriculture Organization (FAO), the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), Bioversity and the Global Crop Diversity Trust. This system, called GENESYS, compiles data from the System-wide Information Network for Genetic Resources (SINGER) of the Consultative Group on International Agricultural Research (CGIAR), the Genetic Resources Information Network (GRIN) of the United States Department of Agriculture (USDA) and Canada, and EURISCO. The results and recommendations of the ECPGR Independent External Review that took place in July 2010 at Bioversity Headquarters in Rome were summarized.

Discussion

Marc Lateur: The ECPGR Documentation and Information Network Coordinating Group lacks the expertise of a fruit tree database manager, which means that the specific information and documentation needs of this category of crops are often neglected.

Recommendation 1

The ECPGR Coordinator will bring the above request to the attention of the Documentation and Information Network Coordinator.

Emilie Balsemin: The Group needs more data (especially characterization) than are available in EURISCO so that it can select the Most Appropriate Accessions (MAAs). It is not sufficient to download data from EURISCO for this purpose. Moreover, discrepancies remain between the lists of accessions in EURISCO and those received by the European *Prunus* Database (EPDB) Manager.

Stein Harald Hjeltnes: It is not clear whether data should be provided to the National Inventory Focal Point for upload to EURISCO and/or to the EPDB Manager.

L. Maggioni: Only those accessions that are included in EURISCO (National Inventory accessions) will be eligible for designation to the European Collection. The passport data should be sent to the National Inventory Focal Point and specific additional information on the accessions sent to the EPDB, as agreed by the Group. Curators of the collections should be careful not to create unnecessary discrepancies between the data provided to EURISCO and the EPDB. Data can be downloaded from EURISCO for inclusion into the EPDB, but the opposite is not possible since EURISCO only receives data from the National Inventory Focal Points.

Recommendation 2

All WG members should make sure that data of their national Prunus collections are sent to EURISCO (via their National Inventory Focal Points) and that they are also included, with the additional agreed descriptors, in the EPDB.

Working Group on Prunus: Chairperson's report

D. Benediková, interim Chair of the Group following the departure of Ken Tobutt in 2008 from the positions of WG Chair and Coordinator of the Fruit Network Coordinating Group (NCG), presented the results of the Group's activities after the previous WG meeting held in Cyprus in 2005.

An ad hoc workshop on fingerprinting of fruit varieties was held in December 2006 at East Mallong, United Kingdom, attended by 20 experts from 11 European countries. The discussions focused on choosing reference accessions, standardizing microsatellite sets, harmonizing allele labelling and standardizing record sheets, so that microsatellite fingerprints can be used effectively to characterize accessions of *Prunus*, *Malus* and *Pyrus* collections and, in particular, to facilitate comparison of data sets between laboratories to detect duplicates and synonyms.

Participants proposed a set of molecular markers and a set of reference accessions for each crop. The cherry set was subsequently reported at the meeting of the European Association for Research on Plant Breeding (EUCARPIA) in Zaragoza, Spain, in September 2007.

An ad hoc meeting of the ECPGR Fruit Database Managers (*Malus*, *Prunus*, *Pyrus* and *Vitis*) and an ad hoc meeting of European experts on fruit synonyms were organized in Gembloux, Belgium, 23-25 June 2008, at the Centre Wallon de Recherches Agronomiques (CRA-W). These meetings were aimed at harmonizing and sharing progress in the management of European fruit tree collections. The European Central Crop Database Managers of *Malus* (University of Reading, UK), *Prunus* (Institut National de la Recherche Agronomique [INRA], Bordeaux, France), *Pyrus* (CRA-W, Gembloux, Belgium) and *Vitis* (Julius Kühn-Institut, Siebeldingen, Germany) compared the databases and evaluated their progress.

Jointly exploring techniques that would allow harmonization of the databases (DBs) and comparing experiences in DB management, the Managers mapped the future development of the online DBs. The SynoPyrus software, developed by R. Oger and M. Lateur, was

demonstrated, and all DB Managers agreed to use it in the future to identify synonyms, which pose serious problems in collection management, and in the development and use of the DBs. The DB accessions for *Malus/Pyrus* and *Prunus* were analysed with the objective of validating lists of synonyms according to the best reference books for each crop. The Most Appropriate Accessions (MAAs) can thus be identified for inclusion in the European Collection, currently being defined by the initiative for A European Genebank Integrated System (AEGIS). More than 600 cherry accession names were examined by the respective expert groups with the view to determine their most appropriate names, country of historic origin, synonyms linked with bibliographic references and a reference description that could be used for the validation of the accession's identity. Draft guidelines for inclusion of photographs in the ECPGR European Fruit Databases were prepared.

The *Prunus* AEGIS group met in Radzików, Poland, in July 2008. Before the meeting a preliminary list of the MAAs was generated, using the results of the meeting on fruit synonyms and the EPDB as a tool. The group commented on the practicalities of implementing AEGIS and formulated draft Quality Standards.

During 2006 and 2007, the Cherry Database and data sets were revised. EURISCO descriptors, five AEGIS-specific descriptors and molecular descriptors were incorporated. New data sets were included.

The ad hoc workshop on *in situ* and on-farm conservation of *Prunus*, *Malus/Pyrus* and *Vitis* could not take place. The compilation of the *Prunus* Newsletter, issue 6, could not be completed as the compilers (Edite Kaufmane and Daniela Benediková) had not received articles from the WG members. The last *Prunus* Genetic Resources Newsletter issue was compiled by Mihai Botu and distributed in September 2005. The next issue will still be published, but only as an e-newsletter on the ECPGR Web site by December 2010, if the WG members agree to provide articles.

A workplan for Phase VIII was formulated, focusing on the steps needed to implement AEGIS in cherry.

Discussion

A number of partially developed products of the *Prunus* WG have not been finalized and are not available from a central place. In particular, the report of the ad hoc meeting on standard molecular markers for cherry, apple and pears, which was held in 2006 at East Malling, United Kingdom, is still awaited.

Workplan

1. A document including the agreed list of molecular markers for cherry, apple and pear will be prepared by **Felicidad Fernández**, in consultation with the Chair and other WG members, **by the end of January 2011**. The document will be sent to the ECPGR Secretariat and to the EPDB Manager for upload to the *Prunus* WG and the EPDB Web sites.
2. Guidelines for taking photographs of the accessions, to be uploaded to the EPDB Web site, will be finalized by **David Szalatnay** **by the end of 2010** and sent to the EPDB Manager (copy to the ECPGR Secretariat) for upload to the EPDB Web site.

Status of *Prunus* collections in Europe

Summary of the results of a questionnaire compiled by the ECPGR Working Group members

D. Benediková presented the results of the questionnaire for compiling all the information on the status of *Prunus* collections. The questionnaire was distributed to all WG members in preparation for the meeting. The questions concerned nine sections: (i) National organization of *Prunus* genetic resources; (ii) Status and composition of the *Prunus* collection in the country; (iii) Characterization and evaluation; (iv) Use of genetic resources; (v) Contribution to the EPDB; (vi) Priorities for coming years; (vii) Genebank management; (viii) Safety-duplication and (ix) Documentation.

Answers were received from about 52 European institutions (20 private, 30 public and 2 non-governmental organizations [NGOs]) from 15 countries. Ten countries have included all their collections in the national programme, while three have included only some of the collections. The total number of accessions reported is more than 15 700, of which more than 10 700 accessions are of national origin. Collections in Denmark, France, Hungary, Italy and Turkey are those that are most exhaustively characterized. Accessions are mostly used for breeding purposes, but also for supporting the use of heritage varieties in local markets and fruit exhibitions. Only five countries indicated that data were sent to the EPDB. All the countries have *Prunus* field collections with 2-3 trees grafted on specific rootstocks. Trees are visually and regularly checked for the most important diseases (plum pox virus [PPV], *Monilinia* spp. and *Gnomonia* spp.). *In vitro* conservation is carried out in Italy and cryoconservation in Finland, France (2009-11 national French CRYOVEG project) and Italy. Most of the countries (except Bosnia and Herzegovina, and Slovenia) have started the safety-duplication of their collections, with a level ranging from 30% to 80%. Safety-duplicates are held in a different location of the same conservation sites (as in Slovakia) or in a different region of the country (France). The main problems that the *Prunus* accessions face are: health status (virus infection requires eradication); lack of funds for curating staff and plant maintenance; decreasing national budgets for activities such as identification, collecting, introduction, evaluation and regeneration; urgent regeneration of some very old field collections.

Discussion

Bosnia and Herzegovina, and Denmark need to send some additional information to make the questionnaire more exhaustive.

UK: All *Prunus* genetic resources as such will be deposited in Brogdale. Other material will be kept for breeding and will not be included in future lists. A number of private collections need to be identified and listed as UK genetic resources, as long as the owners agree.

Spain: A clearer picture of the *Prunus* genetic resources in Spain will emerge once the national group on *Prunus* meets later in 2010.

Spain and Slovakia: Breeders have their own collections of research material, but this is not part of national genetic resources collections.

Romania: The national fruit and grapevine collections in Romania do not receive any support from the government. These collections are over 25 years old and in bad

phytosanitary condition; if no firm action is taken the collections will be lost in the near future.

Germany: The situation is better because large collections have been identified and maintained with private funds. A network has been set up, and public funds are provided for characterization.

Denmark: The genebank collection is open to all, but some material is conserved only in private collections and not available to the public to safeguard breeding interests.

Finland: Each genebank should have a specific mandate; breeding is included in the mandate of some genebanks. Private funds should be sought if no public funds are available. It would be interesting to know to whom the members of the German network are accountable.

Germany: Network members have specific contracts and report to the coordinator on the status of their collections.

Switzerland: Conservation and characterization are currently funded by the government. Inventory and precise identification of the material are important to find out what is really unique (there are many more names than actual genotypes). The efforts can thus focus on conservation and characterization of unique accessions, and funds can be saved.

Germany: The same action is carried out in Germany, in order to decrease the number of accessions to be maintained.

L. Maggioni: AEGIS is trying to empower the European Networks so that they can monitor the problems and find solutions. Unique accessions that are being lost in one country could be transferred to a different host country that volunteers to maintain them.

Spain: Rationalization should go even further by adopting the concept of core collection, which represents maximum genetic diversity with a minimum number of samples.

UK: The government listens to public opinion, which often sees genetic resources as museum material (no scientific basis for conservation of genetic diversity). Rationalization is therefore difficult to implement, as genetic diversity is not the only criterion.

Denmark: Rationalization is important but it requires funding; it is also a demanding and complex job. The funding situation has worsened over the past 10 years.

Finland: It would be useful to learn from networks established with private funds.

M. Lateur: As a summary of the discussion, it can be said that lack of funds is always a problem. To rationalize the use of funds, the concept of "national collection" should be introduced in each country. The Group should start developing this concept as soon as possible. It is also important to develop public awareness, since it is easier to maintain the collection when the public knows that something valuable is being conserved. Government aid can be better garnered through public support.

Recommendation 3

The Group expressed concern for the reported situation of the old fruit collections in Romania, particularly the threat of loss of original varieties that are genetically unique and need to be

re-propagated and cured of virus infections. The Group recommended that the Romanian national programme dedicate sufficient and specific resources to rescue and maintain for the long term the valuable collections and/or seek solutions for the transfer of the collections to a different country.

Workplan

3. *H. Flachowsky will prepare **by the end of 2010** a document describing the successful example of the national network of fruit tree conservation in Germany and circulate it to the WG members. Other members (in particular representatives from Belgium, France, Italy, Sweden and Switzerland) will then use this as a model to draft similar documents including an evaluation of their national experience/systems for conservation, where it will be important to identify the strengths and weaknesses of the systems (**by June 2011**). All examples will be uploaded to the ECPGR Prunus WG Web site.*
4. *The Group agreed that missing information (i.e. countries that have not yet completed the questionnaire) should be sent to D. Benediková **by the end of September 2010**, in order to complete the overview of the status of Prunus conservation in different countries. The revised compiled results will be uploaded to the ECPGR Prunus WG Web site.*

The European Prunus Database (EPDB)

Progress and future plans of the EPDB

E. Balsemin presented the European *Prunus* Database (EPDB), originally established at the Nordic Gene Bank (NGB), Alnarp, Sweden in 1983 and then maintained by INRA-Bordeaux, France, since 1994. The EU GEN RES 61 Project partners provided data on *Prunus* genetic resources during 1996-98. The first online version of the DB was launched in September 2005, containing 2708 cherry accessions maintained by 24 institutes from 11 countries. The DB contains data of European collections of all *Prunus* species, cultivated stone fruits and their related species as well as wild species. The EPDB portal will provide access to six distinct databases (Almond, Apricot, Cherry, Peach, Plum and Inter-specific hybrids), providing passport, characterization and evaluation data. The passport data consist of 13 passport descriptors defined by the ECPGR *Prunus* WG, in addition to the 34 EURISCO descriptors derived from the *FAO/IPGRI Multi-Crop Passport Descriptors*. Phenotypic data consist of characterization and evaluation descriptors defined by the *Prunus* WG and photographs of trees, fruit, flowers and leaves. Molecular data consist of descriptors of both molecular markers (simple sequence repeat [SSR] primer sequences) and genotypes (in general, two allele sizes for diploid species). The EPDB contains data on 12 756 *Prunus* accessions from 59 institutes in 19 countries. The current online version (<http://cbi.labri.fr/outils/EPDB/index.html>) displays data for only cherry (5087 accessions). The Plum and Almond Databases (3300 and 133 records, respectively) are available on INRA's local server and should be online by July 2011. The status of the Cherry and Plum Databases is provided in Appendix II, p. 25.

The DB is based on recent freely available technologies, MySQL 5.1 (database management system), Apache 2 (Web server) and PHP 5.2.4+ (scripting language). Different levels of access are possible: public access and password-protected partner access. The database philosophy allows distinguishing of individual trees of each accession and grouping of accessions into accession groups (varieties). Phenotypic descriptions made in different years and molecular assessments are also traceable to the individual trees that were characterized.

The main functionalities allow (1) quick advanced searches for one or multiple accessions; (2) comparisons of accessions maintained at different sites (possibility of comparing photographs as well as passport, phenotypic and/or molecular data of several accessions of the same variety); (3) export of data in different output formats, where molecular data are directly compatible with a wide range of software for genetic analysis; (4) linking of accessions according to accession groups such as synonyms or accession names for identification of duplicate groups.

The upload process uses a tabular format (.csv) that allows uploading of many data simultaneously. It is also possible to capture data directly on a dedicated Web interface, therefore enabling the data owners to autonomously add new accessions and/or new data sets; they can also edit or delete data.

The technical development of the EPDB model tool is being finalized by an INRA team (Thomas Persohn, Emilie Balsemin and Loïck Le Dantec) and should be completed by the end of 2010. This tool will be tested by CRA-W Gembloux, Belgium, and possibly adopted by the *Pyrus* WG for use in the ECPGR *Pyrus* Database.

Other *Prunus* database structures for plum, almond, apricot, peach cultivated species and their related species will also be set up by July 2011. A new Web site will be created with a common EPDB portal and links between the *Prunus* crop databases. Data can then be either imported by the DB Manager from Excel data files received, or input directly by the data owner who will receive login and uploading instructions.

In order to ensure provision of complete data, the Group will need to agree on a set of minimum mandatory passport descriptors, to add new characterization and evaluation data descriptors and to agree on a set of molecular markers data.

Discussion

M. Lateur confirmed that the *Pyrus* DB Manager was prepared to test the new functionalities of the *Prunus* DB and possibly adopt them, in order to harmonize the various Fruit DBs to the extent possible. M. Lateur also thought that the new EPDB tool is very good but also sophisticated, raising concerns on the sustainability of the system once the external developers complete their work.

E. Balsemin assured that the developers will provide an administration and information manual and train INRA staff. Moreover, the tool should be perfectly functional and further assistance be needed only when new developments will be requested.

H. Flachowski asked whether it would be possible to hide data that are not updated. Participants agreed that even if it were possible to hide data, the responsibility of the data rests upon the data providers and that it would be better to indicate the updating date. Even old information (characterization) of accessions no longer existing would still be relevant for pedigree and other analyses. Accessions that no longer exist should be flagged, but their data should be retained.

Workplan

5. The Group (including the *Pyrus* DB Manager) agreed that the ECPGR Network funds that were allocated to the *Prunus* and *Pyrus* DBs will be used to extend the contract of the developer at INRA-Bordeaux and to allow completion of the database (**by the end of December 2010**).
6. INRA-Bordeaux will extend the EPDB structure to other *Prunus* crops **by July 2011** and then provide login and uploading instructions to the WG members **by July 2011**.
7. **As of August 2011** (or possibly earlier if the DBs are online before July), WG members will upload *Prunus* data to the EPDB, following the instructions provided by the EPDB Manager.

AEGIS and sharing of responsibilities

General status of AEGIS

The background, objectives and perceived benefits of the AEGIS initiative were summarized by L. Maggioni. Among the milestones of AEGIS, the following were listed: the *Strategic Framework Policy Guide*, which is the document endorsed by the Steering Committee in 2008 and the Memorandum of Understanding (MoU), which is the legal document that was sent for signature to all ECPGR member countries in the first half of 2009. To date, 22 countries have signed the MoU and become members of AEGIS. Other achievements in the establishment of AEGIS are the agreement reached on the development of the AEGIS Quality System (AQUAS) and a discussion paper establishing its principles, which is available online. Agreement was also reached by the Steering Committee on the requirements of the European Accessions, thereby establishing the scope of AEGIS. The selected material should be:

- under the management and control of the governments,
- in the public domain and offered by the Associate Members for inclusion into AEGIS,
- genetically unique to the best available knowledge,
- plant genetic resources for food and agriculture as defined in the International Treaty or medicinal and ornamental species,
- germplasm of European origin or introduced in Europe and that is of actual or potential importance to Europe (for breeding, research, education, or for historical and cultural reasons).

A Competitive Small Grant Scheme was launched in 2009 to facilitate the establishment and operation of this process. Eighteen proposals were received and three awarded. A new call for proposals is foreseen for late autumn 2010.

The EUROGENEBANK proposal, aimed at the implementation of AEGIS, was submitted to the European Commission's Seventh Framework Programme (FP7) Research Infrastructure Call in 2009; although it met the threshold, it was not selected for funding. The proposal will be re-submitted for the 2012 call, provided a new suitable call is launched.

The European Collection will be the main product of AEGIS, consisting of dispersed Most Appropriate Accessions (MAAs); it will be a virtual European genebank. By signing the MoU, countries accept responsibilities for long-term conservation and availability of the European Accessions and agree to conserve/manage them according to the quality standards. Conservation/management strategies for each crop need to be prepared by the respective Crop WGs/NCGs and approved by the Steering Committee.

EURISCO is the information portal for the European Collection. In this catalogue, accessions will be flagged as (AEGIS) European Accessions. No definite procedures have been set, and no precise definition of MAA exists (it will be the result of a process). As foreseen in the process, the WG will agree on "selection criteria" for each crop or crop group to identify MAAs among sets of duplicates. The process of identification of MAAs can proceed from two sides: a proposal from the WG on the basis of its knowledge of existing unique and most appropriate accessions; or a selection of "candidate" accessions at the national level, considering the selection requirements and the possible offers for long-term maintenance. The two processes will need to come to an agreed conclusion through an iterative process. The process is, however, not yet completely defined as it requires empirical testing, and alternatives to the above approach can be considered.

It is proposed that the WG takes the following actions:

1. Proceed with the compiling of the final list of selection criteria;
2. Strive to ensure that missing data are provided to EURISCO as soon as possible;
3. Assist countries (and their Associate Member institutes) in identifying “candidate” MAAs in their collections;
4. Develop a crop- or gene pool-specific list of MAAs on the basis of the candidate accessions, using the selection criteria;
5. Where necessary, suggest any additional accessions to countries;
6. Establish a final list of European Accessions for a given crop gene pool and confirm the final decision with National Coordinators.

Update on the activities of the AEGIS sub-group on Prunus and draft list of Most Appropriate Accessions – Cherry

D. Giovannini and E. Balsemin reported on the activities carried out together with K. Tobutt and Janos Apostol as members of the sub-group on *Prunus* during the AEGIS feasibility study. This group had reached conclusions and recommendations regarding the categories to be considered for the choice of genotypes and the criteria for selecting MAAs among these genotypes.¹ Bottlenecks were identified as: the need for countries to join AEGIS and offer their accessions before any selection can be made; the compromising health status of many virus-infected accessions; the lack of characterization data and frequent difficulties in identifying the correct denomination of accessions due to synonymies and homonymies. In order to enable the selection of MAAs, a number of mandatory and recommended passport data were identified.

A procedure to establish a list of MAAs was drafted, and which will be applied once the countries join AEGIS. A test exercise to simulate the MAA definition had been made with an initial list of 2708 sweet cherry accessions, which revealed 1116 unique genotypes and 367 duplicate groups. Secondary selection criteria were applied to the 367 duplicate groups in order to identify 367 primary and 367 reserve MAAs in these groups.

The *Prunus* (cherry) minimum technical standards proposed by the AEGIS *Prunus* sub-group were reported; these are to be discussed and endorsed during this meeting (see further, pp. 16-17). The proposed workplan originally drafted by the sub-group for the implementation of AEGIS for *Prunus* was outlined; its estimated cost amounts to approximately € 250 000.

Discussion

Selection criteria to be used for the choice of MAAs were prioritized; the Group provisionally ranked the criteria in order of importance as follows:

1. Trueness-to-type (particularly relevant for perennial clonal crops in which synonyms and homonyms are frequent)
2. Accompanied by passport information using the EURISCO multi-crop passport descriptors
3. Accompanied by characterization and evaluation data (at least those priority descriptors defined by the *Prunus* WG)
4. Maintained in country of origin
5. Of high health status, e.g. virus-free
6. Of known source, whether collected or bred.

¹ See: “Progress report of the AEGIS model crop: *Prunus* - July 2008” (http://aegis.cgiar.org/documents/crop_specific_documents.html).

Workplan

8. WG to agree on selection criteria for MAAs and prioritize them **by June 2011**.

Proposed next steps for implementation of the AEGIS Quality System

L. Maggioni summarized the elements that are being established for the implementation of the AEGIS Quality System (AQUAS).

1. Operational genebank manual

A draft template was prepared by the Secretariat and it was tested by the Nordic Genetic Resource Center (NordGen), Sweden, and by the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Germany. The template, once approved by the AEGIS Advisory Committee, has to be filled in by the Associate Members' genebanks in order to complete their operational genebank manuals. The *Prunus* WG is invited to comment on the template from the fruit tree conservation point of view.

2. Generic operational standards

The standards will be drafted by the Secretariat based on the operational manuals and suggestions by the WGs; this activity will also take into account FAO's ongoing, parallel process of revising the international genebank standards.

3. Agreed minimum crop-specific technical standards

All WGs will need to agree on their respective crop standards, which will complement the generic standards.

4. Quality management system procedures

The WGs, with advice from the AEGIS Advisory Group, will need to organize a system for record-keeping and reporting as well as the implementation of a monitoring system.

Workplan

9. The Group agreed to update the cherry passport data of all the national and regional collections and provide data to the EPDB (direct upload or Excel file) and to the National Inventory Focal Point (**before the end of 2011**).
10. WG members will encourage the National Inventory Focal Points to upload cherry (and other *Prunus*) data to EURISCO and the National Coordinators to propose a national list of cherry MAA candidates for the European Collection (AEGIS).
11. The list of candidate accessions will be discussed by the WG at the meeting on fruit synonyms **in 2012** and at the ad hoc AEGIS meeting of the *Prunus* WG **in 2012 or 2013**.

Ad hoc meeting on fruit synonyms held in Gembloux, Belgium, 23-25 June 2008

(Organizer: M. Lateur)

Main decisions taken at the ad hoc meeting of Fruit Central Crop Database Managers

(E. Balsemin and M. Lateur)

The European Central Crop Database Managers of *Malus* (University of Reading, UK), *Prunus* (INRA, Bordeaux, France), *Pyrus* (CRA-W, Gembloux, Belgium) and *Vitis* (Julius Kühn-Institut, Siebeldingen, Germany) decided to:

1. Strengthen the collaborative work and share tools or applications (e.g. the *Pyrus* DB will move its structure into that of the Cherry DB, which is currently being developed

at INRA-Bordeaux; specific synonyms software needs to be further developed so that it can be shared and included in the different Databases).

2. Develop and harmonize various tools; all DBs will work in the same informatics environment: (1) Linux, MySQL, PHP, Apache-server; (2) same model of homepage with three different levels of access ("Public access"; "Partner access" and "Administrator access") and (3) same set of passport descriptors (FAO, EURISCO, AEGIS), same model for inclusion of molecular markers data and photographs. In the case of photographs, a query tool will be developed for posting a photo gallery, which will be useful for comparing accessions, homonyms and/or synonyms.
3. Establish a common workplan.

Main decisions taken at the ad hoc meeting of experts on Cherry and Pear synonyms

(M. Lateur)

The general objectives of the meeting were: (1) to help identify recurrent synonyms and duplicates within and between collections; (2) to help potential users find what they are looking for in the ECPGR databases; (3) to define a catalogue of names that would be accepted for inclusion in the database, together with the respective conversion tables to locate the accession names originally used; (4) to help the process of identification of the accessions that could belong to the national collections and (5) to help the process of selection of the MAAs for the implementation of the AEGIS concept.

More specific objectives of this meeting were also (1) to define and build up a step-by-step, simple and efficient methodology to sort out the most important synonyms that are present in both the ECPGR collections and in the fruit DBs as it will facilitate the management of data and related lists of synonyms from collections and reference books; (2) to clearly define some specific passport data (e.g. "Country of origin", which is defined as the historical country of origin where the cultivars were either raised or bred, or where they traditionally originated. This information plays an important role in the AEGIS concept as it allows the management of data and related lists of synonyms from collections and reference books or bibliographic sources.

With this preliminary work on synonyms, using the knowledge of the crop experts, the WG will be put in condition to rationalize the European collections as it will be possible to putatively identify 40-50% of the duplicates that are currently present within and between the collections.

This meeting took a new initiative of gathering expertise from both inside and outside the WGs. Therefore, invited participants included an expert on old pomology books, specific crop experts, and an author belonging to the European Nursery Association, which has listed all cultivated fruit varieties in the world's nursery market.

Thorough preparatory work before the meeting ensured that all participants received, prior to the meeting, a list of the most frequent accessions recorded in the ECPGR Cherry and Pear DBs, including both already recorded or proposed synonym lists with bibliographic references and proposed country of origin. The experts could thus properly prepare for the meeting. It was also very useful that several old reference books on pomology, either in printed form or as electronic scanned documents that were recorded in an Access DB, were brought to the meeting.

The main outcomes of the meeting were:

1. It was pointed out that there are historically five types of origins of "old" and obsolete cultivars: (i) old named amateur-bred cultivars with historic names and

written references and proper description; (ii) local landraces (Populer 1979²) derived from the oral rural traditions, very often having rural names and without any historical written descriptions; (iii) professional breeders' cultivars with a new complication of both protected and/or marketing trademarks that are synonyms of the cultivar name and with the multiple mutant sports having other names but genetically derived from a cultivar; (iv) unnamed chance seedlings; (v) unnamed and unidentified cultivars.

2. *Definitions*

- **"Synonym"** is defined as a different name or spelling used throughout time and space but that defines the same and unique cultivar or genotype.

Synonyms have different origins: for example, different misspellings such as different transliteration versions; new local names given to well-known cultivars; different transcription from oral language (e.g. for cherry 'Burtoul'; 'Boûrtoule', etc.); different translations of generic names (e.g. 'Bigarreau'; 'Kraker'; 'Bigaroons', 'Knorpelkirschen') and translations of names; new names given for commercial purposes (often by nurseries).

Conflicts between authors concerning origins, identity and synonyms are also found; therefore the concrete experiences of experts are essential for this work.

- **"Homonym"** is the same name or one of the words of a given name that actually belongs to a different cultivar or genotype.
- **"Accession Name"**: name received from the donor of the accession. In the case of unknown cultivars: provisional name given by the person who collected the accession. All accession names always need to be validated by a defined procedure.
- **"Preferred Name"** or **"Referenced Name"**: it is the first historical name given or, in some cases, the most common name that is used as the most convenient and chosen from various synonyms and variant spellings. These names also always need to be validated by a defined procedure and be endorsed by a reference book or historical references.

3. As an important part of the methodology for the building up a referenced system, a representative sample of the European diversity of reference books was proposed as well as a standardized list of acronyms of these references. These acronyms will be used in the DB for tracing the references, either for the "Country of origin", "Preferred name" or "Synonym" concept.
4. Another part of the methodology was to assign to each "Preferred name" linked to a well defined cultivar a chosen book or reference source, which the experts were convinced represented the first historically available description and/or the most precise available historical representative description of the cultivar. A specific link was then put in the list of accessions that are present in the Fruit DBs.

These referenced descriptions of the cultivars will be scanned to make them easily available – at the cultivar or genotype level – in the future DBs.

² Populer C. 1979. Liste des anciennes variétés belges de poiriers et de pommiers réunies à la station de phytopathologie à Gembloux [List of old pear and apple Belgian varieties collected at the phytopathology station in Gembloux]. Note technique 3/23. Centre de recherches agronomiques de l'Etat, Gembloux. 70pp.

The crop expert groups had the possibility of applying this defined methodology for both the first 600 most common accession names that were already included in the Cherry DB and the first 1200 most common accession names that were already included in the Pear DB.

Scientific contributions, research activities

The establishment of a national genebank for vegetatively propagated plants

Inger Hjalmarsson informed about the national genebank for vegetatively propagated plants that is under establishment in Sweden by the Programme for Diversity of Cultivated Plants (POM). In the meantime, a national survey is being conducted to collect material that will be included in the genebank, which will be ready in 2015. It will contain fruit and berry varieties that are part of the national heritage. The mandate list contains: (1) local Swedish varieties, (2) varieties produced by Swedish breeders and (3) traditional foreign varieties that have been grown in Sweden for a long time. Conservation of *Prunus* varieties will consist of two trees in a local clonal archive, two trees in the future central collection in Alnarp and two trees (nuclear stocks) at the Swedish Elite Plant Station.

Local clonal archives are established by contracts establishing compensations for municipalities, horticulture schools and outdoor museums that maintain the varieties. In this way, material is conserved in its original area and public awareness is created.

Discussion

Chance seedlings of interest would also be conserved as mandate material.

Genetic diversity in fruit and berry crops estimated with molecular markers

Larisa Gustavsson reported on a project funded by the Swedish Board of Agriculture (SJV)/POM for SSR-based investigation of Swedish mandate cultivars (apple, pear and cherry). Large collections kept at Balsgård and in the clonal archives include old material that may have been mislabelled and is not well characterized/identified. Four cultivar classes were distinguished through DNA-marker screening:

1. Samples originating from a single source, with each cultivar displaying a unique DNA profile
2. Samples from different sources, with each cultivar still displaying only a unique DNA profile
3. Cultivars sharing a DNA profile with at least one other cultivar (i.e. the same genotype has been sampled under different names, which therefore are synonyms)
4. Cultivars having different DNA profiles that are erroneously known under the same name (homonyms).

Standard SSR markers were used for Swedish heritage varieties of sweet and sour cherry, pear and apple. Unique profiles, new triploids, cases of synonyms and possible mislabelling were identified and greatly clarified the identity of the material in the national collections. These molecular studies showed that mislabelling of varieties is very frequent (up to more than 30%), especially in collections of old varieties. These findings are useful for removing unnecessary duplicates from the collections and using correctly identified material in research projects. Genetic diversity in the collections was also investigated, and it was found that Swedish apples are a good representation of the genetic diversity of the crop.

Discussion

M. Lateur: Morphological characterization and pomology expertise is a necessary complement to correctly interpret the molecular results and take informed decisions on the possible rationalization of the collection. Presenters confirmed that this is duly taken care of in Sweden.

Overview of Prunus research in Italy

Petra Engel gave an overview of research carried out in Italy over the past 10 years, based on a bibliographic survey of 656 publications derived from international symposia (*Acta Horticulturae*) and relevant national congresses. The most researched crop is peach/nectarine, followed by apricot and cherry. The main research topics were autochthonous germplasm (characterization and use), orchard management, physiology, stress and diseases, and fruit quality.

Presentation of guidelines for taking photographs of Prunus accessions

D. Szalatnay reminded the Group that at the last meeting in Cyprus (December 2005), a task force composed of D. Szalatnay, E. Balsemin, M. Lateur, J. Blazek, M. Höfer and C. Gregoriou was formed with the mission to prepare guidelines for photographing accessions. Photographs are convenient and effective for an immediate characterization of an accession. They can also be easily uploaded to a database and raise awareness by attracting visitors. But it can also be a time-consuming activity. Correct focus, exposure and white balance are very important. Minimum requirements are that the fruit size must be visible, the identification of the accession needs to be on the photograph and the fruit needs to be taken from different angles. Each photograph should be traceable to the given individual tree. Detailed instructions were outlined. These will be compiled and made available to the Group as per Workplan decision 2 (see above, p.3).

Discussion

F. Fernández: It is difficult to take the right illustration of red colour in strawberries, cherries, etc.

D. Szalatnay: It is important to spend time to learn the most suitable camera settings.

M. Lateur: If artificial light is not available, natural light can be used, but photographs should not be taken before 10:00 or after 15:00, otherwise colour reproduction may not be accurate.

D. Szalatnay: In case of photographs of leaves or flowers in the field, it is important to include a reference measure in the photograph.

SAFENUT project

Rafael Socias i Company presented the results of the EU-funded AGRI GEN RES 870/2004 project on "Safeguard of hazelnut and almond genetic resources: from traditional uses to novel agro industrial opportunities" (SAFENUT, <http://www.safenut.net/>).

Work Package 5 is about the definition of the European almond core collection. Almond was found to have very high variability in blooming time, which depends on temperature conditions. Almond quality is defined by protein, oil content, oleic/linolenic acid ratios and tocoferol content. Dendrograms of genetic diversity were obtained, taking not only the kernel composition into account, but also molecular markers. Photographs were taken of all the accessions.

Discussion

R. Socias i Company: Bitter almonds are not maintained in the collection, since they are not considered interesting. It is only one recessive gene that determines bitterness.

Slow growth and cryopreservation for ex situ conservation of fruit germplasm

Emilia Caboni was unable to attend the meeting, but sent a PowerPoint presentation, which is posted on the WG Web site.

Updating the Workplan of the *Prunus* Working Group***Prunus Genetic Resources Newsletter***

Only Latvia sent a contribution for the next issue of the *Prunus* Newsletter. It was therefore proposed that the information presented during the current meeting be compiled in the *Prunus* Newsletter.

Workplan

12. *Abstracts of presentations made during the meeting or full articles will be sent to D. Benediková by 15 December 2010 to be included in an electronic Newsletter that will be compiled by D. Benediková. WG members who did not attend the meeting are also welcome to send their contributions about national activities on Prunus genetic resources.*

Seventh Framework Programme (FP7)

M. Lateur presented the philosophy and objectives of the FruitBreedomics project that was recently approved for funding under the European Commission (EC) Seventh Framework Programme for Research.

L. Maggioni reported on the evaluation received from the EC regarding the EUROGENEBANK project, for which a request for funding the implementation of AEGIS had been submitted in December 2009 to the EC Seventh Framework Programme for Research. The evaluation was generally positive (score 11.5/15) and passed the threshold, but did not reach a sufficiently high score to be funded. The limitations of the proposal, according to the evaluators, were reported.

Calls for proposals related to plant genetic resources that were launched as part of the EC 2011 Work Programmes were mentioned. Full details are available at http://cordis.europa.eu/fp7/home_en.html.

Discussion

M. Lateur pointed out that the INTEREG IVC programme (<http://www.interreg4c.net/>) could be explored for re-submitting the proposal for implementation of AEGIS.

Workplan for the second part of Phase VIII (2011-2013)

Proposed points of the workplan were presented for preliminary discussion so that they could be finalized before the end of the meeting (see below).

Discussion

S.H. Hjeltnes: Considering the proposal, how can the quality standards be applied to trees maintained on-farm, such as the private collections that participate in national conservation networks?

Accessions that would be part of AEGIS need to respect the standards.

Guidelines should be developed for on-farm conservation and allowing evolution to continue. The Group however could not identify at the moment any volunteers to work on these aspects. This initiative, as well as the possibility of organizing an ad hoc meeting with key stakeholders and representatives of the *In situ* and On-farm Conservation Network can be considered for ECPGR's next phase.

Working Group parallel sessions

The WG split into three separate groups to discuss specific items. The results of the discussions are reported below.

Prunus-specific standards for genebank management

Chaired by E. Balsemin.

Participants: Kristiina Antonius, Eva-Maria Gantar, Inger Hjalmarsson, Stein Harald Hjeltnes, Rajmonda Sevo, Rafael Socias i Company, Sandor Szügyi, Selim Tokmak.

The group started the discussion on the basis of the minimum standards for *Prunus* conservation that were proposed by the AEGIS *Prunus* sub-group in 2008.

The following suggestions/precisions were given complementary to the proposal made in 2008:

- Minimum passport data required for the selection of MAAs for AEGIS
 - **Mandatory:** ACCENUMB, ACCENAME, INSTCODE, NICODE, GENUS, SPECIES, ORIGCTY (but not to be confused with the country of the donor; if not known, it should be left blank)
 - **Recommended:** ACQDATE, DONORCODE, DONORDESCR, DONORNUMB, OTHERNUMB, BREDCODE, BREDESCR
 - **Other recommended:**
 - IDENTIF (using a standardized method)
 - VIRUSTATUS and VIRUSDATE (descriptors to be revised)
 - SAMPSTAT
 - STORAGE (but need to revise EURISCO descriptor; e.g. it is not possible to indicate that an accession is stored both in the field and in the greenhouse).

- Minimum passport data for a given accession that is received/acquired
 - **Recommended to the donor or the collector:** ACCENAME, GENUS, SPECIES, DONORCODE or DONORDESCR, DONORNUMB, ORIGCTY, and other passport data known to the donor/collector
 - **Mandatory for the genebank** (for an accession that is registered in the genebank documentation system): ACCENUMB, INSTCODE, DONORCODE or DONORDESCR (if accession is received from a donor institute), and GENUS (if not previously mentioned by the donor/collector)

- **Recommended to the genebank:** ORIGCTY (but not to be confused with the country of the donor; if not known, it should be left blank).
- When an accession is dispatched, it should be accompanied by a label with minimum passport data, as follows:
 - **Mandatory:** NICODE (only for transfers from the National Inventory to EURISCO), INSTCODE, ACCENUMB and GENUS, because all are mandatory descriptors for EURISCO
 - **Recommended:** ACCENAME, SPECIES, ORIGCTY (if known).
- A set of minimum *Prunus* characterization data should be agreed by the WG (also useful for selection of MAAs for AEGIS), including both phenotypic and perhaps genotypic data and photographs of the fruit, if possible. This list is still to be discussed (see further, “Phenotypic and molecular characterization” session).
- Regarding the possible addition of other *Prunus*-specific standards as new elements to complete the whole process, it was considered that elements of management of a *Prunus* genebank such as managing human resources, ensuring physical security and ensuring security of equipment are not *Prunus*-specific. On the other hand, data management and traceability require the following standards:
 - Traceability of information for each individual, from the initial grafting to death;
 - Registration of data into dedicated files or databases.

It is also important to use a standard methodology to verify accession identity. The WG will need to develop this methodology.

Additional elements of the *Prunus*-specific standards need to be included, keeping in mind that other propagation techniques beside grafting are used:

- Propagation/re-propagation: use virus-tested compatible rootstocks (only if grafting is necessary);
- Distribution: maintain a record of the transaction.

Additional elements of the *Prunus*-specific standards may have to be included, keeping in mind other conservation methods:

- Seed collections: only for conservation of rootstock seed, but these are not part of a genebank activity (not to be included in the *Prunus* AQUAS);
- *In vitro* culture collections: *in vitro* experts would need to develop these standards;
- Cryopreserved collections: as the techniques are not well developed for *Prunus*, it is too early to include any standard in the *Prunus* AQUAS;
- Add greenhouse/screenhouse collection standards.

Regarding the draft version (v.8) of the template for the preparation of a genebank operational manual provided by the ECPGR Secretariat, it was recommended that a section on conservation in greenhouse/screenhouse be added. It was also suggested that the existing operation manual prepared by the Corvallis USDA genebank be used as a basis as it includes screenhouse operations.

Workplan

13. A proposed list of minimum passport descriptors (mandatory and recommended) for all *Prunus* species will be prepared by E. Balsemin and circulated to the Group for final approval **by November 2010**.
14. A document summarizing all the proposed *Prunus*-specific standards will be prepared by E. Balsemin and circulated to the Group for final approval **by June 2011**.

Safety-duplication arrangements, in vitro and in vivo

Chaired by Daniela Benediková.

Participants: Mihai Botu, Edite Kaufmane, Miroslav Cizmovic, Metka Hudina and Torben Toldam-Andersen.

Safety-duplication is considered very important. Many countries organize it in the field and greenhouse (*in vivo*); only a few countries organize it *in vitro* (Italy and Estonia at the experimental stage). *In vitro* safety-duplication is considered expensive and problematic for the slow regeneration of the entire plant. The protocols are also very crop- and variety-specific. *In vivo* safety-duplication is preferred, with 2-3 trees per accession in 2 places. The need to prepare protocols for *in vitro* conservation was also discussed.

Workplan

15. D. Benediková and M. Botu will prepare the safety-duplication methodology **by December 2010** and circulate it to the Group for approval.

Phenotypic and molecular characterization

Chaired by M. Lateur.

Participants: Felicidad Fernández (Rapporteur), Daniela Giovannini, David Szlalatnay, Henryk Flachowsky, Hedi Kalmäe, Larisa Gustavsson, Petra Engel and Pakeza Drkenda.

As an introduction to the specific work of characterization and evaluation of genetic resource collections, M. Lateur presented some general methodological aspects of the work.

To start with, "characterization" work, which is of most specific importance for the identification of the material, should be differentiated from the "evaluation", which is of tremendous importance for the further potential use of the material. Characterization deals with the most stable and the less environmentally influenced traits. Therefore the characterization work can be carried out during a limited period of time with data collected during at least 3 representative years. Concerning the evaluation work, the methods used, the orchard management conditions and specific methodologies need to be properly defined; duration or number of years needed for a proper evaluation work depends on, for example, priorities defined by the curators, available budgets, available competent staff, orchard management systems, representative years. Evaluation is a dynamic process that needs to be properly planned to obtain logical series of data that can be finally analysed. For the evaluation, an average of 5-6 representative years would be optimal with a strict minimum of 3 good representative years.

The task of curators is to implement a good **primary evaluation** that can be defined as a first screening using standardized protocols, but with a very simple experimental design because the very large number of accessions allows only a few replications. This work should take place in a homogeneous environment to enable comparison of accessions in the same conditions. This primary evaluation could later on be followed by a secondary

evaluation applied to a subset of the collection, using a proper experimental design with the aim of confirming and increasing the accuracy of the first screening data.

Some basic recommendations were given for disease evaluation as it is quite specific work requiring plots that are not sprayed at all. A sufficient level of knowledge must be acquired on the pathology of the disease and its cycles, as well as good diagnosis expertise and good knowledge of the specific expressions of the symptoms. This will help to identify the proper time for evaluation and to retain years with sufficient pressure and with a representative diversity of pathotypes. There should be sufficient uniformity of disease pressure inside the orchards and sufficient presence of representative controls.

Good assessment scales are also required. The first priority should be assessment scales that follow the global approach reflecting disease intensity (intensity = incidence + severity components) instead of separating the "incidence" and "severity" components.

The descriptor list itself is less important than the need to have relative disease susceptibility values for each accession in order to rank them for this specific trait.

The importance of validating the quality of data by checking their replicability was also pointed out.

One suggestion was to wait until a sufficient number of representative evaluation data were accumulated (at least 3-6 representative evaluation years) before analysing the data and summarizing the interpreted results. These results would eventually be sent to the Central Crop Database as an "end product" rather than "raw material".

It is important to specify the material and methods used, the identification of each tree, the number of replicates, the number of evaluation years, the yearly mean susceptibility scores observed in a specific plot in order to determine some quality parameters of the data itself. To define minimum statistical parameters such as mean values, standard deviation, maximum value and minimum value, observed data should be collected over several years. Control cultivars for those traits should be included.

It was considered very important to use as far as possible the existing descriptors, which have already been defined by the *Prunus* WG. As the domain of genetic diversity considered is much larger than that covered by the International Union for the Protection of New Varieties of Plants (UPOV), it was approved that the scales at the bottom and at the top be opened, when needed, by using the term "extremely", signifying "more than what we currently have or know". A good description of the methodology used was deemed very important for obtaining the scores of the descriptor. Reference cultivars should cover a wide range, so that they can be suitable for all locations in Europe where the experiments will be conducted.

A first set of primary descriptors should be defined, and then other series will follow. A proposal will also be made to prioritize within the set of priority descriptors.

The scales will be harmonized by using 1-9 scales as far as possible and when reasonably feasible. For descriptors dealing with colours, the Group decided to refer to colour charts and to reference cultivars.

The Group was deeply impressed by the quality of the descriptor lists for cherry, plum, apple and pear developed by D. Szalatnay from Switzerland, using very good quality diagrams and photographs to illustrate a large number of descriptors. These descriptor lists were considered a reference document that could be used for many descriptors. This document may possibly be translated under the umbrella of ECPGR, but no formal decision was taken.

Workplan

16. *The team and M. Lateur prepared a document listing a first set of primary descriptors for cherry, plum and peach. Concerning the other important crops such as almond and apricot, the Group decided to continue using the lists that had already been defined by the WG. A draft document was circulated to the Group for approval and short discussion.*

Closing session

The report was presented, and the recommendations and workplan items were adopted. The workplan items are summarized in a table (Appendix I, pp. 23-24).

Daniela Benediková expressed her wish to pass the Chair of the WG to someone else; she was applauded and thanked for her leadership of the Group in the past 3 years. Daniela Giovannini was elected as new Chair and Kristiina Antonius as Vice-Chair.

The Group thanked CRA-Forlì for the excellent organization and hospitality.

APPENDICES

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Appendix I. Workplan for the second part of Phase VIII (2011-2013)

Task Sharing (AEGIS)

Action	Carried out by	By when
Agree on a set of minimum passport descriptors (mandatory + recommended) for all <i>Prunus</i> spp.	E. Balsemin, Chair, <i>Prunus</i> WG members	November 2010
Update and agree on a set of minimum <i>Prunus</i> -specific standards for genebank management	E. Balsemin, Chair, <i>Prunus</i> WG members	June 2011
Agree on selection criteria for MAAs and prioritize them	E. Balsemin, Chair, <i>Prunus</i> WG members	September 2011
Draft a safety-duplication methodology and circulate for approval by the WG	D. Benediková and M. Botu	End of 2010
Update cherry passport data (set) for national or regional collections and send them to EPDB and NFPs	WG members, curators	Before the meeting on fruit synonyms (before the end of 2011)
Encourage NFPs to send data to EURISCO and encourage NCs to offer a country list of cherry MAA candidates for the European Collection (AEGIS)	WG members	Before the meeting on fruit synonyms (before the end of 2011)
Ad hoc meeting on fruit synonyms and descriptors	20 people x 2 days (€ 13 150) Jointly with <i>Malus/Pyrus</i> WG meeting	February 2012
Ad hoc meeting of <i>Prunus</i> WG: analysis of all candidate accessions, using EPDB and/or EURISCO tools to select primary and secondary MAAs	10 people x 2 days (€ 10 000)	2012 or 2013

Characterization and evaluation

Action	Carried out by	By when
Agree on a set of minimum characterization and evaluation descriptors for all <i>Prunus</i> species (priority and secondary descriptors)	Task Force "Characterization and Evaluation" <i>Prunus</i> WG (M. Lateur, F. Fernández, D. Giovannini, D. Szalatnay, H. Flachowsky, H. Kalmäe, L. Gustavsson)	Proposed priority descriptors sent by the end 2010 – approval and comments by the Group by end February 2011
Update characterization and evaluation data (including photographs)	WG members, curators	September 2010 (start) – 2013
Upload data to the EPDB	WG members, curators	January 2011 (start) - 2013

Documentation and Information

Action	Carried out by	By when
Completed questionnaire on the status of national collections sent to Chair	All WG members that have not sent the questionnaire before the Forlì meeting	End of September 2010
Compilation of results of the questionnaire into a document to be uploaded to the ECPGR <i>Prunus</i> WG Web site	D. Benediková	October 2010
Preparation of e-Newsletter, compiling articles on national status and other scientific material presented at the Forlì meeting	D. Benediková and all WG members	15 December 2010
Guidelines for photographs (to be uploaded to the <i>Prunus</i> WG and EPDB Web sites)	D. Szalatnay	End of 2010
List of agreed molecular markers and reference cultivars (to be uploaded to the <i>Prunus</i> WG and EPDB Web sites)	F. Fernández	January 2011
German national management model for fruit genebank (case study document)	H. Flachowsky	End of 2010
Other national management models for fruit genebank (case study documents)	I. Hjalmarsson, D. Szalatnay, M. Lateur, E. Balsemin, other volunteers	June 2011
Completion of the main technical developments of the EPDB model tool	EPDB Manager and colleagues (€ 3000-5000)	End of 2010
Development of other <i>Prunus</i> database structures for plum, almond, apricot, peach cultivated species and their related species	EPDB Manager	July 2011
Upload data to the EPDB	WG members, curators	August 2011 (start) - 2013
Ad hoc Fruit Database Managers Meeting	EPDB Manager, M. Lateur (€ 2440)	2011 or 2012

Appendix II. Number of accessions recorded in the Cherry and Plum Databases

Table 1. Number of accessions registered in the current Cherry Database (status in September 2010)

Country	<i>P. avium</i>	<i>P. cerasus</i>	Hybrids	Other related spp.	Total
Belgium	315	46	9	115	485
Czech Republic	237	90		1	328
France	144	30	8	1	183
Germany	235	103			338
Greece	30				30
Hungary	89	120			209
Israel	32	2	5	10	49
Italy	846	217			1063
Poland		120	1	2	123
Portugal	24				24
Romania	58	45			103
Slovakia	23	20			43
Spain	108	7	4	2	121
Turkey	80	122	1		203
Ukraine	699	550	14	58	1321
United Kingdom	384	24	18	38	464
Total	3304	1496	60	227	5087

Table 2. Number of accessions registered in the current Plum Database (status in September 2010)

Country	<i>P. domestica</i>	<i>P. cerasifera</i>	<i>P. salicina</i>	<i>P. insititia</i>	Other related spp.	Total
Belgium	126	6		12	9	153
Czech Republic	128					128
France	64	6				70
Germany	164	18	5	1		188
Hungary	421					421
Israel	22	3	66	2	9	102
Italy	85	1	1			87
Norway	19	1		1		21
Poland	103	10	10		4	127
Romania	181	38		67	6	292
Slovakia	39	10				49
Spain	49	29		14	1	93
Switzerland	236	132			3	371
Turkey	109	124	41	1	1	276
Ukraine	70	304	12	2	502	890
United Kingdom	20	1	2	2	7	32
Total	1836	683	137	102	542	3300

Appendix III. The European *Prunus* Database – Status in September 2010

Estimated numbers of accessions to be included into the EPDB as of July 2010 (accessions which have already been included in the Cherry Database are shaded)

Country	INSTCODE	Cherry		Plum		Peach		Apricot		Almond		Hybrids		Total per institute	Total per country
		No.	Year	No.	Year	No.	Year	No.	Year	No.	Year	No.	Year		
Belgium	BEL014	23	2005	10	2005					1	1999	35	1999	69	676
	BEL019	93	2010	138	1998									231	
	BEL020	369	2008	5	2008			2	2008					376	
Switzerland	CHE009			371	2003									371	371
	CZE031	328	2006	128	1997									456	
Czech Republic	CZE050							81	2005					81	537
	DEU451	338	2005	188	2005									526	
Germany	ESP007	62	2005	93	1999	35	1999							211	730
	ESP110	59	1999			246	1999			214	1999	21	1999	519	
	FRA011					60	2010	70	2010	50	2010			180	
France	FRA046					175	2005							175	710
	FRA057	183	2009	70	2010	102	2010							355	
United Kingdom	GBR012	464	2005	32	1999	20	1999			1	1999	21	1999	538	538
	GRC012	30	1999			26	1999	5	1999	23	2010			84	
Greece	GRC016									16	2010			16	100
	HUN021	209	2005	421	2005	201	2005	408	2005	106	2005			1345	
Hungary	ISR013	49	1997	102	1997	245	1997	169	1997	40	1997	13	1997	618	618
	ITA001	607	2006							58	1999			665	
Italy	ITA020	37	2006					77	1999					114	1373
	ITA026			55	1999									55	
	ITA027	19	2006											19	
	ITA032	28	2006											28	
	ITA045	97	2006											97	
	ITA052	31	2006					52	1999					83	
	ITA061	4	2006											4	
	ITA076	87	2006	32	1999									119	
	ITA213													12	
	ITA216	9	2006							12	2010			9	
	ITA228	93	2006											93	
	ITA322	38	2006											38	
	ITA332	4	2006											4	
ITA332	9	2006											9		
ITA-CRAB										24	2010			24	

Legend:
INSTCODE = FAO institute code
No. = number of accessions

Estimated numbers of accessions to be included into the EPDB as of July 2010 (accessions which have already been included in the Cherry Database are shaded)

Country	INSTCODE	Cherry		Plum		Peach		Apricot		Almond		Hybrids		Total per institute	Total per country
		No.	Year	No.	Year										
Norway	NOR016			21	1997									24	24
Poland	POL029	123	2005	127	2005							1	2005	251	251
Portugal	PRT072	24	2005											24	24
	ROM009	101	1997	168	1997	34	1997				49	1997		352	
	ROM016	2	1997	103	1997							14	1997	119	
	ROM030							30	1997					30	
Romania	ROM032			1	1997									1	
	ROM035							26	1997					26	
	ROM040			1	1997									1	
	ROM-BT			2	1997									2	
	ROM-ST			17	1997									17	
	SVK001						8	2005						23	
	SVK010	21	2005	32	2005									53	
Slovakia	SVK011			5	2005						14	2005		19	129
	SVK012	22	2005	7	2005									29	
	SVK018			5	1998									5	
Slovenia	SVN018													46	46
Turkey	TUR001	203	1998	276	1998	85	1998	236	1998	253	1998			1053	1053
	UKR019									1	2006			1	
	UKR027	6	2006											6	
	UKR028	27	2006	42	2006									69	
	UKR030	337	2006	59	2006	10	2006	1	2006	17	2006			424	
Ukraine	UKR032	157	2006	37	2006			115	2006					309	3157
	UKR034	65	2006	124	2006									189	
	UKR036	375	2006	113	2006	86	2006	106	2006	79	2006			759	
	UKR046	354	2006	515	2006	1	2006	530	2006					1400	
19 countries	59 institutes	5087		3300		1334		1926		1004		105		12756	12756

Legend:
INSTCODE = FAO institute code
No. = number of accessions
Year = last update of data

Appendix V. Acronyms and abbreviations

AARI	Aegean Agricultural Research Institute, Menemen, Izmir, Turkey
ACW	Agroscope Changins-Wädenswil, Switzerland
AEGIS	A European Genebank Integrated System
AQUAS	AEGIS Quality System
CGIAR	Consultative Group on International Agricultural Research
CITA	Centro de Investigación y Tecnología Agroalimentaria (Center for Agro-Food Research and Technology), Spain
CRA-W	Centre Wallon de Recherches Agronomiques, Belgium
EC	European Commission
ECPGR	European Cooperative Programme for Plant Genetic Resources
EPDB	European <i>Prunus</i> Database
EU	European Union
EUCARPIA	European Association for Research on Plant Breeding
EURISCO	European Internet Search Catalogue
FAO	Food and Agriculture Organization of the United Nations
GRIN	Genetic Resources Information Network
INRA	Institut National de la Recherche Agronomique (National Institute for Agricultural Research), France
IPGRI	International Plant Genetic Resources Institute (<i>now Bioversity International</i>)
IPK	Leibniz Institute of Plant Genetics and Crop Plant Research, Germany.
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MAA	Most appropriate accession
MoU	Memorandum of Understanding
MTT	AgriFood Research Finland, Pääkkäne, Finland
NC	National Coordinator (ECPGR)
NCG	Network Coordinating Group
NFP	National Focal Point (National Inventory/EURISCO)
NGB	Nordic Gene Bank, Alnarp, Sweden
NGO	Non-governmental organization
PPV	Plum pox virus
SCDP	Statiunea de Cercetare-Dezvoltare pentru Pomicultura (Fruit Growing Research-Extension Station), Romania
SINGER	System-wide Information Network for Genetic Resources
SSR	Simple sequence repeat
UPOV	Union internationale pour la protection des obtentions végétales (International Union for the Protection of New Varieties of Plants), Geneva, Switzerland
USDA	United States Department of Agriculture

Appendix VI. Agenda

Eighth Meeting of the ECPGR Working Group on Prunus 7-9 September 2010, Forlì, Italy

Monday, 6 September 2010

Arrival of participants

Tuesday, 7 September 2010

09:00-10:30 **1. Introduction**

- Welcome by the local organizers and opening remarks (*D. Giovannini and D. Benediková*)
- Self-introduction of participants and approval of agenda
- Update on ECPGR (*L. Maggioni*)
- Working Group on *Prunus*: Chairperson's report (*D. Benediková*)

10:30-11:00 *Coffee break*

11:00-12:30 **2. Status of *Prunus* collections in Europe**

- Summary of the results of a questionnaire compiled by the ECPGR WG members (*D. Benediková*)
- Discussion on issues, problems and priorities for coming years

12:30-14:00 *Lunch break*

14:00-15:30 **3. The ECPGR *Prunus* Database (EPDB)**

- Progress of the EPDB (*E. Balsemin*)
- Contribution of data to the EPDB (*E. Balsemin*)
- Discussion on further improvement of the Database

15:30-16:00 *Coffee break*

16:00-18:00 **4. AEGIS and sharing of responsibilities**

- General status of AEGIS (*L. Maggioni*)
- Update on the activities of the AEGIS sub-group on *Prunus* and draft list of Most Appropriate Accessions - cherry (*D. Giovannini and E. Balsemin*)
- Proposed next steps for implementation of AEGIS - AQUAS (*L. Maggioni*)
- Ad hoc synonym meeting held in Gembloux in 2009 (*M. Lateur*)
- Discussion and workplan

20:00 *Dinner*

Wednesday, 8 September 2010

- 09:00-10:30 **5. Scientific contributions, research activities**
- The establishment of a national genebank for vegetatively propagated plants (*I. Hjalmarsson*)
 - Genetic diversity in fruit and berry crops estimated with molecular markers (*L. Gustavsson*)
 - Overview of *Prunus* research in Italy (*P. Engel*)
 - Presentation of guidelines for taking photographs of *Prunus* accessions (*D. Szalatnay*)
 - Slow growth and cryopreservation for *ex situ* conservation of fruit germplasm (*E. Caboni*)
- 10:30-11:00 *Coffee break*
- 11:00-12:30 **6. Updating the Workplan of the *Prunus* Working Group**
- *Prunus* Genetic Resources Newsletter (*E. Kaufmane*)
 - Seventh Framework Programme (FP7) (*L. Maggioni and M. Lateur*)
 - Workplan for the second part of Phase VIII (2011-2013)
- 12:30-14:00 *Lunch break*
- 14:00-16:00 **7. Working Group parallel sessions (3 groups)**
- Three topics will be discussed during these parallel sessions by all groups. The topics will be chosen from the following list:
- *Prunus*-specific standards for genebank management (*E. Balsemin*)
 - Safety-duplication arrangements, *in vitro* and *in vivo* (*D. Benediková*)
 - Phenotypic and molecular characterization (*M. Lateur*)
- 16:00-16:30 *Coffee break*
- 16:30-18:00 **8. Working Group plenary sessions**
- Report of parallel sessions
 - Finalizing the Workplan

Thursday, 9 September 2010

- 09:00-13:00 Visit to cooperative of producers; drafting of report by rapporteur(s)
- 13:00-14:30 *Lunch*
- 14:30-16:00 *Free-time in Forlì*
- 16:00-18:00 Presentation of the report and adoption of recommendations
Selection of Chair and Vice-Chair
Next meeting
Closing remarks
- 19:00 *Departure for social dinner in Cesenatico*

Friday, 10 September 2010

Departure of participants

Appendix VII. List of participants

Eighth Meeting of the ECPGR Working Group on Prunus 7-9 September 2010, Forlì, Italy

N.B. Contact details of participants updated at the time of publication. However, the composition of the Working Group is subject to changes. The full list, constantly updated, is available from the Working Group's Web page (<http://www.ecpgr.cgiar.org/workgroups/prunus/prunus.htm>).

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