



Photos: Audrey Didier



A European Genebank Integration System



Update on the activities of the AEGIS sub-group on *Prunus*

**AEGIS model crops curators and dbs managers meeting
1-3 July 2008, Radzików, Poland**



Emilie Balsemin

- Genetic Resources Centre for *Prunus* species. Fruit Research Station (UREF) INRA Bordeaux



Daniela Giovannini

- Fruit Crop Research Unit, Forlì (CRA-FRF)



Participants for *Prunus*:

Janos	Apostol (Hungary)
Emilie	Balsemin (EPDB manager, France)
Daniela	Giovannini (Italy)
Kenneth	Tobutt (UK)

Reasons to choose *Prunus* as model crop

Multicrop, important to Europe
Perennial, vegetatively propagated
Non Annex I crop of the IT
DB relatively advanced

Model species for *Prunus*: cherry (*P.avium*)
Decentralised System

Photo: Audrey Didier



Expected outputs

1. Criteria for MAA identification and procedure

2. Draft list of MAA

3. (AQUAS) AEGIS Quality System - draft crop guidelines

4. Proposed workplan for implementation

5. Estimate costs for implementation

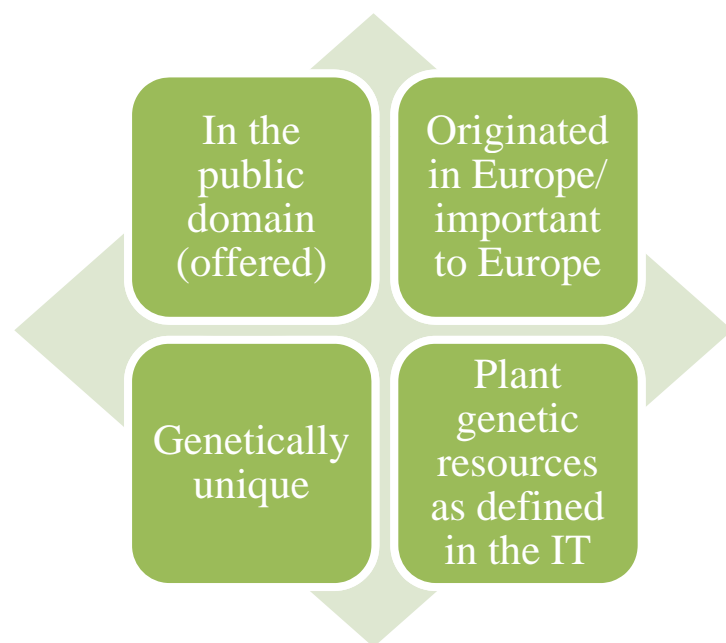


Photo: Audrey Didier



1. Criteria for MAA identification and procedure

AEGIS Selection Criteria Primary, Crop Aspecific



Crop Specific

1A. Choice of genotypes

2B. Choice of MAA of these genotypes



1A. Choice of genotypes: categories to be considered for AEGIS



Traditional cultivars and/or landraces



Old and/or obsolete cultivars



Modern cultivars, bred conventionally



Significant breeding lines



Genetic stocks, mutants and seedlings of mapping progenies



Crop wild relatives

AEGIS Prunus group recommendation: no prioritization



1B. Choice of MAA of these genotypes



Maintained in 'country of origin'



Of known origin, whether collected or bred



Accompanied by passport information (EURISCO multi-crop passport descriptors)



Of high health status, e.g. virus-free



Accompanied by morphological and/or molecular characterization data



Accompanied by agronomic evaluation data



Correctly named (in perennial clonal crops synonyms/homonyms are frequent)



Bottle-necks



Maintained in the country of origin

Accession offer

Country must sign MoU



Of high health status, e.g. virus-free

Health status

Explore “*In vitro*” systems as a way of maintaining clean accessions virus-free



Correctly named (in perennial clonal crops synonyms/homonyms are frequent)

Denomination

Characterisation data & Photos



Bottle-necks



Accompanied by passport information (EURISCO multi-crop passport descriptors)

Description level

Minimum
passport &
recommended
data

obligatory



ACCENAME
ORIGCTY
INSTCODE
SPECIES

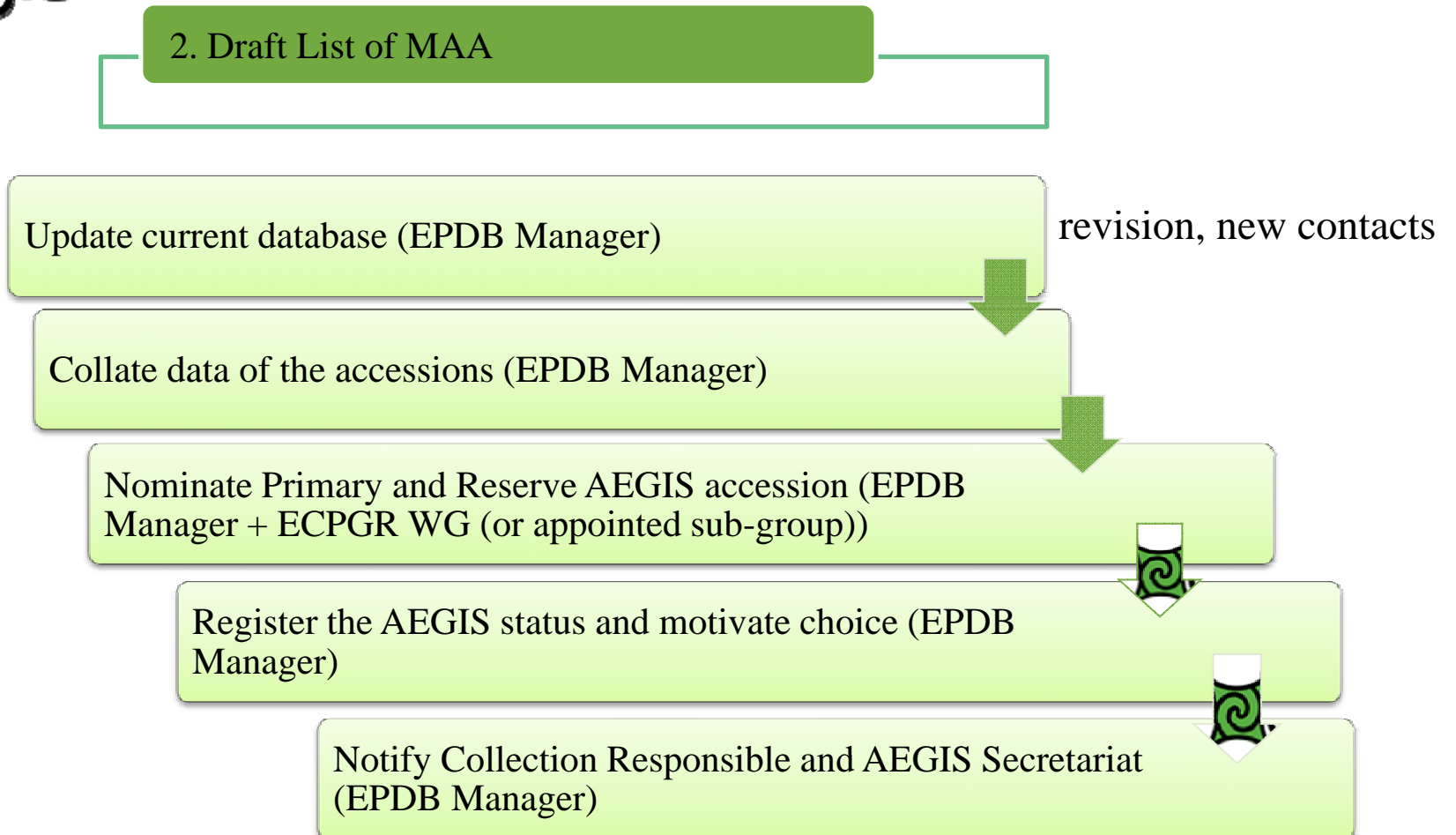
recommended



ACCENUMB
ACQDATE
DONORCODE & DONORDESCR
DONORNUMB
OTHERNUMB
BREDCODE & BREDDDESCR
IDENTIF (*Prunus* specific descriptor)
VIRUSTATUS & VIRUSDATE (*Prunus* specific descriptors)



2. Draft List of MAA



This procedure is applicable after MoU signature

The list of Primary & Reserve accessions is dynamic, according to inclusion of new collections to AEGIS



2. Establishing the list of MAAs, using the EPDB as a tool

In 2008, the generation of a preliminary list of MAAs has been put into practice in advance of the implementation of AEGIS, using the EPDB as a tool

2,731 sweet cherry accessions registered in EPDB in 2008

Process?

Draft list of 1,483 MAAs



2A. List of MAAs generated for *Prunus* based on the EPDB:
Choice of genotypes, using primary selection criteria

2,731 sweet cherry accessions registered in EPDB in 2008

Primary selection
criteria

668 accessions were excluded:

- 267 unnamed accessions
- 70 protected cultivars
- 259 UPOV ref. cultivars from Non-European countries
- 5 mislabelled accessions
- 67 others

2,063 preselected sweet cherry accessions for AEGIS

EPDB descriptors used for the selection

- ACCENAME: accession name
- ORIGCTY: country of origin
- SPECIES [only *Prunus avium*]
- PROTECT: protection status [No]
- EUCOLL: Belonging to the European Collection? [Yes]



2A. List of MAAs generated for *Prunus* based on the EPDB:
Choice of genotypes, analysing duplicates

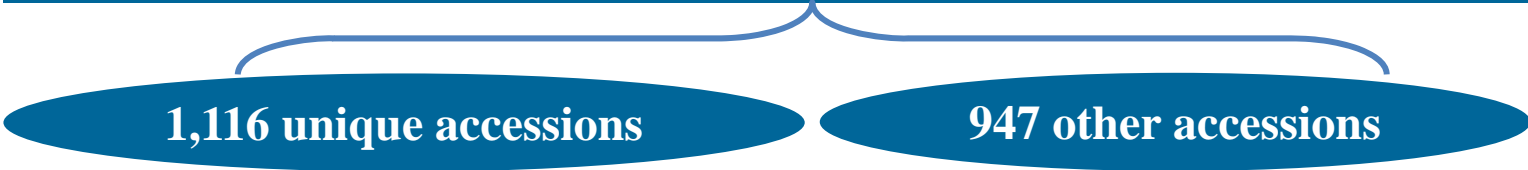
2,731 sweet cherry accessions registered in EPDB in 2008



668 accessions were excluded:

- 267 unnamed accessions
- 70 protected cultivars
- 259 from Non-European countries
- 5 mislabelled accessions
- 67 others

2,063 preselected sweet cherry accessions for AEGIS



1,116 unique accessions

947 other accessions



1,116 unique genotypes

Analysed by the Cherry experts during the Fruit Synonyms meeting (CRA-W, Gembloux, 2008)



How many unique genotypes?



2A. List of MAAs generated for *Prunus* based on the EPDB:
Choice of MAAs, resolving synonyms problems

2,731 sweet cherry accessions registered in EPDB in 2008

668 accessions were excluded:

- 267 unnamed accessions
- 70 protected cultivars
- 259 from Non-European countries
- 5 mislabelled accessions
- 67 others

2,063 preselected sweet cherry accessions for AEGIS

1,116 unique accessions

947 other accessions

1,116 unique genotypes

367 duplicate groups

Fruit Synonyms meeting
(Gembloux, 2008)

302 in > 1 country
65 in 1 country

1,116 unique accessions + 367 MAAs after using secondary selection criteria



2A. List of MAAs generated for *Prunus* based on the EPDB:
Choice of MAAs, using secondary selection criteria

Secondary selection criteria

- Maintained in 'country of origin'
- Of known origin, whether collected or bred
- Accompanied by passport information (EURISCO multi-crop passport descriptors)
- Of high health status, e.g. virus-free
- Accompanied by morphological and/or molecular characterization data
- Accompanied by agronomic evaluation data
- Correctly named (in perennial clonal crops synonyms/homonyms are frequent)

EPDB descriptors effectively used

- ORIGCTY**
- INSTCODE & INSTDESCR**
- DONORCODE & DONORDESCR**
- BREDCODE & BREDESCR**
- Other passport descriptors (few data) ☹**
- VIRUSTATUS (no data) ☹**
- VIRUSDATE (no data) ☹**
- Morphological descriptors (few data) ☹**
- Molecular descriptors (no data) ☹**
- Agronomical descriptors (few data) ☹**
- ACCENAME**
- PREFNAME: preferred name (new)**



2A. List of MAAs generated for *Prunus* based on the EPDB:
Draft list of sweet cherry MAAs

2,731 sweet cherry accessions registered in EPDB in 2008

668 accessions were excluded:

- 267 unnamed accessions
- 70 protected cultivars
- 259 from Non-European countries
- 5 mislabelled accessions
- 67 others

2,063 preselected sweet cherry accessions for AEGIS

1,116 unique accessions

947 other accessions

1,116 unique genotypes

367 genotypes

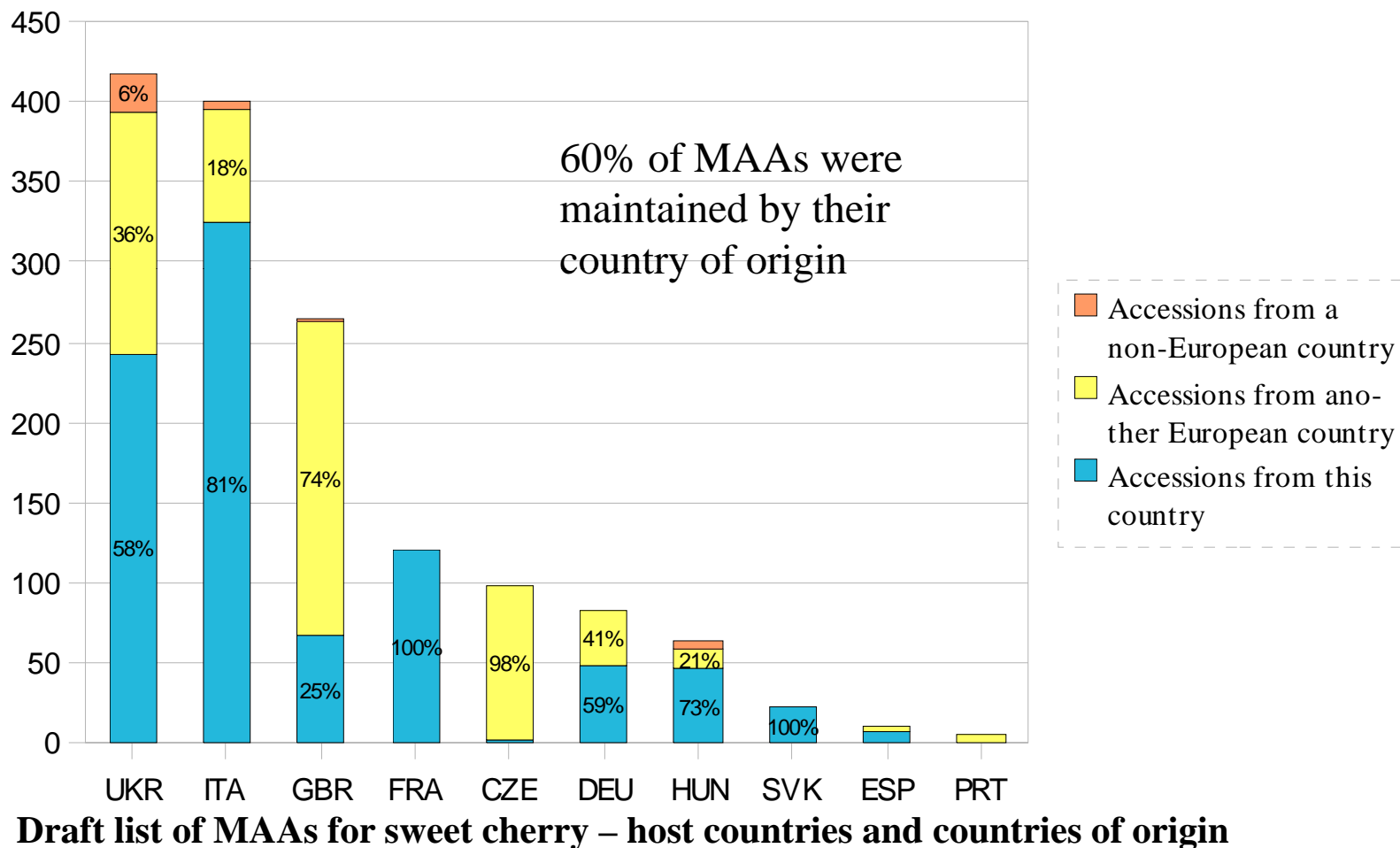
Fruit Synonyms meeting
(Gembloux, 2008)

302 in > 1 country
65 in 1 country

Draft list of 1,483 MAAs (+367 reserve accessions)



2A. List of MAAs generated for *Prunus* based on the EPDB:
Analysing the draft list of sweet cherry MAAs



➔ This list will be revised after the update of the data sets and probably after the signature of MoU



2B. Experiences with the use of the selection criteria while establishing the list of sweet cherry MAAs

ADVANTAGES

- ☺ EPDB easy to use for the application of selection criteria

- ☺ 6 useful passport descriptors:
 - Accession name
 - Synonyms
 - Country of origin
 - Holding institute
 - Donor institute
 - Protection status

LIMITS

- ☹ No countries had yet offered accessions to AEGIS
 - ➔ All the countries should sign the MoU

- ☹ Lack of participation of some countries in the EPDB: important *Prunus* collections are not in contact with the EPDB

- ☹ Problems of synonymy and trueness-to-name
 - ➔ Clarification of the existing synonyms and homonyms is very important to help identify the MAAs to be included in AEGIS

- ☹ Lack of adequate information could be bottle-neck in selection process: MAAs could not easily be selected if candidates accessions had no-comparable data sets



3. AQUAS (AEGIS Quality System) - draft crop guidelines

PDCA approach

PLAN – say what you do

- Definition of “minimum technical standards”
- Agreement

DO – do what you say

- Acceptance of standards
- Implementation of agreed standards

CHECK – let check that you do what you say

- Self-checking
- External checking

ACT – correct and improve what you say you do

- Arrange capacity building
- Improve and suggest improvements

ACTORS

AEGIS WG

Prunus WG

*NCs and curators by MoU signature
participating curators*

curators

by curators when requested

NCs

participating curators

AQUAS should be realistic and based on the principle of consensus

3. AQUAS (AEGIS Quality System) - draft crop guidelines

Prunus (cherry) minimum technical standards proposed by AEGIS *Prunus* group (to be endorsed by *Prunus* WG)

Receipt & propagation of new AEGIS material




- Receipt with a minimum passport data + phytosanitary docs + MTA
- Add to genebank register and give the accession a number
- Propagate onto virus-tested rootstocks and label correctly
- Provide the passport data to EPDB manager

3. AQUAS (AEGIS Quality System) - draft crop guidelines

Prunus (cherry) minimum technical standards proposed by AEGIS *Prunus* group (to be endorsed by *Prunus* WG)

Maintenance of AEGIS accessions

- 
- A decorative vertical bar on the left side of the list, featuring a repeating pattern of green and black stylized symbols, similar to the AEGIS logo, arranged in a vertical column.
- Four trees (2+2) per accession (isolation not obligatory)
 - Suitable planting site and tree management
 - Label and map
 - Periodically inspected, visually and/or with tests

3. AQUAS (AEGIS Quality System) - draft crop guidelines

Prunus (cherry) minimum technical standards proposed by AEGIS *Prunus* group (to be endorsed by *Prunus* WG)

Re-propagation of AEGIS accessions



- Correct labelling
- Virus-tested compatible rootstocks
- New plants authenticated by traceability procedures or morphological inspection or fingerprinting

3. AQUAS (AEGIS Quality System) - draft crop guidelines

Prunus (cherry) minimum technical standards proposed by AEGIS *Prunus* group (to be endorsed by *Prunus* WG)

Despatch & disposal



- Two sticks per accession
- Despatch with labels and minimum passport data, phytosanitary doc and MTA
- Two-years notice before withdrawal (??to EPDB, or National Coordinator, or AEGIS Secretariat)

3. AQUAS (AEGIS Quality System) - draft crop guidelines

Prunus (cherry) minimum technical standards proposed by AEGIS *Prunus* group (to be endorsed by *Prunus* WG)

Characterization (if funded)



- Using the *Prunus* WG Descriptors
- Using SSRs agreed at the East Malling workshop (2006) for Molecular characterization
- Photos of the fruits according to the Gembloux protocol (2008)
- Supply data to the DB Manager for inclusion in EPDB



4. Proposed workplan for implementation of AEGIS for *Prunus*

Activities	By whom?
1. Complete minimum passport data in EPDB	Curators and DB_M
2. Choose genotypes for AEGIS	DB_M?
3. Choose MAAs (primary + reserve if available)	Cherry committee
4. Propagate safety duplicates where necessary and plant them (where?)	Curators, D_BM
5. Check the identity of primary and reserve accessions: ie photo, morphological, molecular	Relevant curators
6. Check health status of chosen accessions and notify DB_M	Relevant curators, DB_M
7. Update AEGIS MAAs list and acquire new candidates	DB_M, relevant curators
8. Implement <u>realistic</u> AQUAS in relevant genebanks	Relevant curators
9. Distribute material in response to requests	Relevant curators

More....

Meetings, publications, newsletters, seeking funding

Encourage National genebanks involvement & promote AEGIS to potential users (NC)



5. Estimate costs for implementation of AEGIS (cherry)

Action	Carried out by	Estimated cost
Meetings		
Inauguration meeting	Participating curators and AEGIS group	25,000€
1-year review meeting	Participating curators and AEGIS group	25,000€
3-year review meeting	Participating curators and AEGIS group	25,000€
Data enhancement		
Passport, morphological data and photos for about 1850 MAAs	Participating curators	10€ per accession + 1,500€ for other needs (20,000€)
Fingerprinting of about 1850 MAAs	Several laboratories	25€per accession (46,250€)
Health status monitoring	Several laboratories	25€per accession (46,250€)
Safety duplication of 1200 accessions		
Propagation of safety duplicates	Curators or nurseries	7€per accession (8,400€)
Establishing orchard (2x1200 trees) probably at a single site	Curators	30 to 50€ per accession (48,000€ approx.)
Publicity		
Publications and newsletter		5,000€
Promotion (12 countries)		6,000€

ESTIMATED TOTAL AMOUNT approx. 250, 000 €

The logo for Mægis, featuring a stylized green and black symbol resembling a plant or a network node to the left of the word "Mægis" in a bold, black, sans-serif font.

European
Cooperative
Programme
for Plant
Genetic
Resources



ECP/GR

Warsaw, Castle's square

Photo: Audrey Didier

8° Meeting of the ECPGR Prunus Working Group, 7-9 September 2010, Forlì, Italy