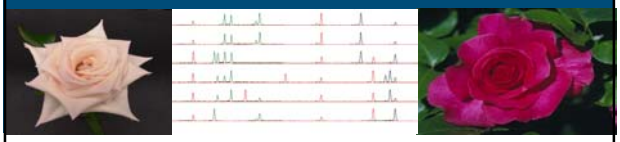
Raad voor plantenrassen

NIAB National Institute of Agricultural Botany

Bundessortenamt

A European reference collection of rose varieties

'CPVO rose project'



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Rose

- Most important ornamental crop
- More than 25,000 varieties of modern rose (Cairns, 2000)
- More than 10,000 hybrid tea varieties
- Rose list 2006: more than 13,000 varieties in commercial trade
- Large collection of roses in "common knowledge"

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Objective

- Construction of an integrated pilot database containing:
  - Administrative data
  - Key morphological descriptors (some TQ characters)
  - Photograph of the variety
  - Molecular profile (based on Microsatellite markers)
- Evaluation of the database

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Division of work

- Garden roses UK + DE
- Greenhouse roses NL

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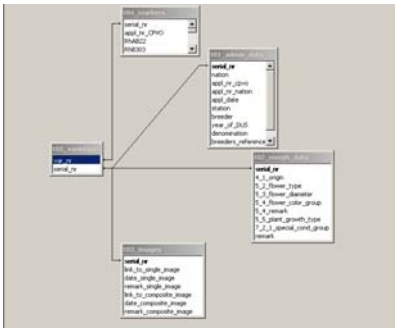
Structure of the database



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Morphological descriptors

- selected from CPVO/TQ-EN-011

4.1	Origin
5.2	Flower: Type
5.3	Flower: diameter
5.4	Flower colour group
5.5	Plant Growth Type
7.2.1	Special conditions: Group

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Flower from the top

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Composite photo

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Selected markers

STMS	linkage group	No. of alleles in 23 varieties	No. of allele phenotypes	Selected for	Scoring quality
RhO517	1	5	14	gr/ht	1
RhEO506	2	12	19	gr/ht	1
RhD221	4	8	12	gr/ht	1
RhE2b	6	7	12	gr/ht	1
RhB303	unknown	6	14	gr/ht	1
RhP519	unknown	7	15	gr/ht	1
RhAB40	4	11	18	gr/ht	1
RhD201	unknown	7	10	gr/ht	1
RhAB22	6	12	15	gr/ht	1
RhP50	3	11	13	Gr	1
RhP518	5	7	15	Gr	1
RhAB73	7	9	18	Gr	1
RhM405	unknown	5	13	Ht	1
RhAB15	2	10	5	Ht	1
RhO507	4	14	18	Ht	1

garden roses (Gr), glasshouse roses (Ht) or both (gr/ht).

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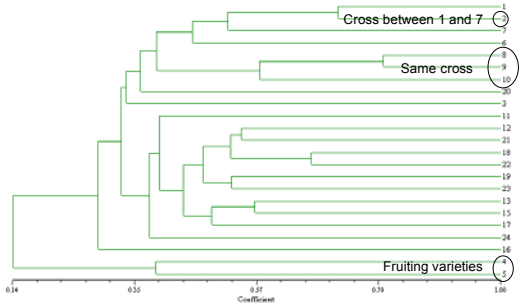
Dendrogram obtained for the 23 varieties



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Standardisation between laboratories

- Proved to be very difficult, poor DNA quality from garden roses
  - Often weak amplification
  - Differences in signal intensity resulted in scoring of a peak in one lab as a marker and not scoring the same peak in the other lab
  - Missing values
  - Mis-scoring of alleles
- Marker data from one lab only

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Database content

- 400 varieties included
  - 314 varieties on behalf of the CPVO
- Morphological data available for all
- At least one photograph for 215 varieties
  - 193 single pictures and 184 composite pictures
- Molecular profiles for 364 varieties.

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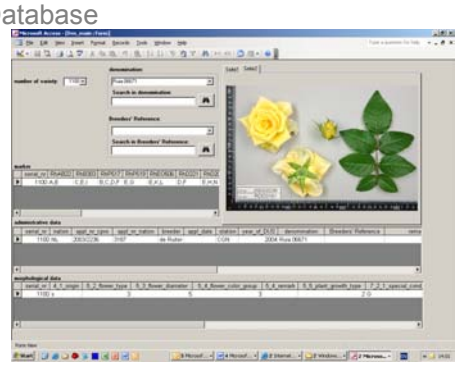
Database



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Evaluation of the database (1)

Morphological descriptors

- are useful, although usefulness varies with rose type
- greenhouse cut flower roses, most varieties currently fall into the same flower and plant growth type
- Flower color group frequently (38% of the case in greenhouse roses) wrongly indicated on TQ
- A ring test will be useful to ensure continued consistency of scoring

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Evaluation of the database (2)

Photographs

- Very important
- For greenhouse roses the composite photo is not so informative as there is very little variation in the extra characteristics photographed
- For the garden varieties the composite adds very useful information
- Point for consideration: cost involved

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Evaluation of the database (3)

Molecular data

- Seedling varieties show unique patterns
- Mutants and mutant groups show the same molecular profile
- For two pairs of varieties there is still uncertainty about their nature
- Useful for spotting mutants
- More effort is needed to harmonize the molecular marker analysis between different laboratories

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Use of the database

- Characterization and cataloging of the reference collection
- Pre-screening and selection of appropriate reference varieties
- Exchange of data on current candidate varieties between testing stations
- To reduce permanent living reference collections at testing stations
- Quality assurance within examination offices (verification of identity/authenticity)

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Advantage for breeders

- Database and molecular profiles based on material submitted for DUS testing
- Identification label for tracing infringements
- Evidence in EDV cases
- Better possibilities to enforce rights

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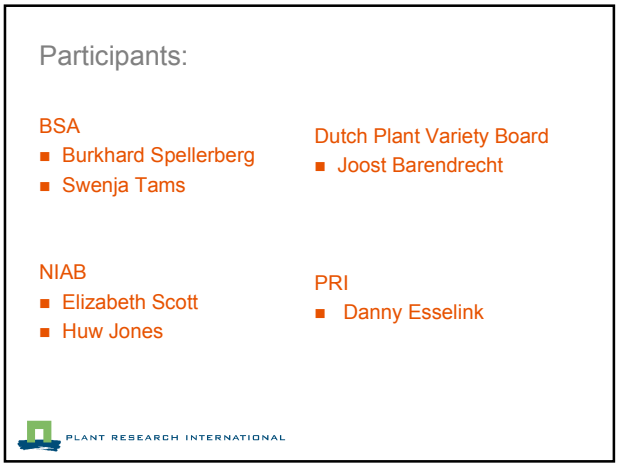
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