Management of Variety Collections

Experience in the Netherlands

Raoul Haegens

Varieties & Trials

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Variety collections -- Motivation

- **Article 7 of UPOV Convention 1991**

  The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of **common knowledge** at the time of filing of the application

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Variety collections -- Demands

- Availability of high number of reference varieties
- Accessible
- Constant

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Variety collections -- Types

1. Living Variety collections
2. Databases with characteristics and descriptions
3. image collections
4. Walking reference collections
5. DNA-databases

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Variety collections -- Reasons

- Making an inventory of varieties of common knowledge

  2. Databases with characteristics and descriptions

- Establishing a variety collection

  1. Living Variety collections, 2. Databases with characteristics and descriptions, and 3. image collections

- Selecting varieties for comparison

  1. Living Variety collections, 2. Databases with characteristics and descriptions, 3. image collections, 4. Walking reference collections, and 5. DNA-databases

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1 Living Variety collections

- Vegetative propagated material: plants
- Seed propagated material: seed

Advantages:

- Direct comparison with candidate variety
- Reliable set of reference varieties in the field trial
- Independent
- DNA-present in case of infringement
- All characteristics visible

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1 Living Variety collections

- Vegetative propagated material: plants
- Seed propagated material: seed

Disadvantages:

- Complex to maintain living collections (especially vegetative plant material
- Expensive (labor, greenhouses etc. – especially vegetative plant material
- Risks: exchange, diseases, etc.
- Less ordered (compared with photo's)
- Not complete

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1 Living Variety collections

Vegetative propagated material: plants
Criteria to maintain a collection

- History (*Anthurium*)
- Problems in the past (*Phalaenopsis*)
- Presence of National Collections (Bulbs)
- Building up knowledge (*Gypsophila*)
- Small differences between Varieties
- Number of varieties (in rose, *Gerbera* to numerous to maintain a living collection)

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1 Living Variety collections

Vegetative propagated material: plants
Selection of varieties

- Protected varieties in EU
- Varieties from important regions
- Varieties of common knowledge already used as a reference variety
- Example varieties (UPOV-guidelines)
- Important types within a crop

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1 Living Variety collections

Vegetative propagated material: plants
Living collections Naktuinbouw

- `Moederplantentuin´ reference garden for perennial plants (circa 4000 varieties)
- Important collections: Tulips, *Hypericum*, *Hosta*, *Ficus*, *Limonium sinensis*, Orchids, Pot Plants
- Other collections: *Eryngium, Hedera, Hemerocallis, Solidaster, Echinops, Echinacea, Solidago, Ligularia, Eupatorium , Tanacetum, Campanula, Silene dioica, Euonymus, Tradescantia, Pinus, Cortaderia selloana, Paeonia, Leycesteria formosa, Symphoricarpos, Centranthus ruber, Origanum vulgare, Perovskia atriplicifolia, Ajuga reptans, Corylus colurna, Lythrum, Oenothera, Papaver, Lysimachia, Clematis, Helleborus, Aconitum, Thalictrum, Sedum, Hydrangea, Prunus laurocerasus, Spiraea, Rodgersia pinnata, Astilbe, Acer, Skimmia, Campsis radicans, Veronica, Phlox, Ulmus elegantissima* (x), *Athyrium niponicum*
- National collections

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1 Living Variety collections

Seed propagated material
Criteria to maintain a collection: ‘always’
Maintenance control

Selection of varieties

- All applications (Plant Breeders Rights and National List)
- All National List varieties
- All varieties sold in or via The Netherlands
- Comparing varieties (ad hoc)

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2 Databases with characteristics and descriptions

Different types of databases (criteria)

- Collection of official descriptions (all crops)
- Naktuinbouw characteristics (seed crops; used for selection of candidate varieties)
- Grouping characteristics (seed crops; Official descriptions of Dutch varieties)
- Exchange with other Examination Offices (all crops)

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2 Databases with characteristics and descriptions

Selection of varieties

- TQ-information from applications
- Official descriptions of Dutch varieties
- Official descriptions of varieties from other EU Member States
- UPOV-Rom: sometimes difficult to obtain information
- OECD list (only agricultural crops)
- Example Varieties UPOV
- Non-official descriptions (varieties not sold in EU by Dutch companies, descriptions from VCU)
- Catalogs from breeding companies
- Literature
- Internet

Excluded in seed crops

- Varieties used for different day-length; climates, latitude, special types

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2 Databases with characteristics and descriptions

Difficulty

In most vegetative propagated crops (mainly ornamentals) the knowledge of varieties of common knowledge is limited. Often varieties are not registered.

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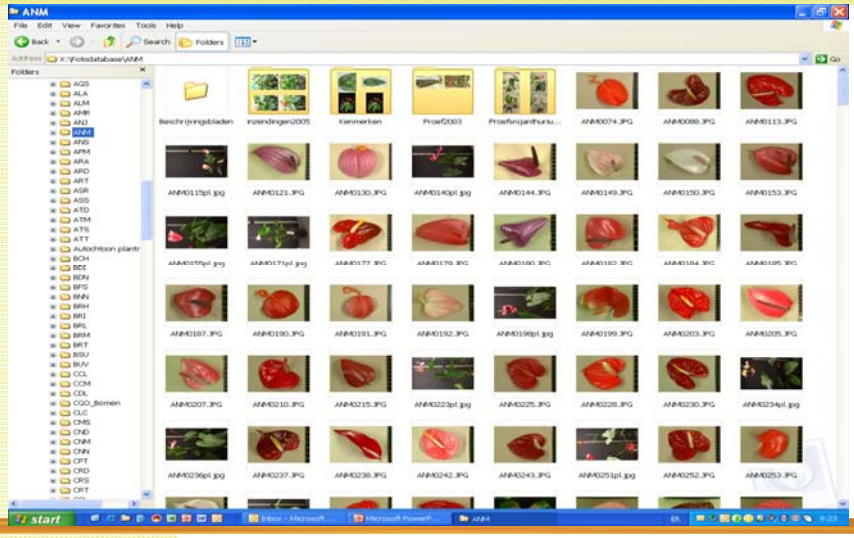
3 image collections



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3 image collections

Items for attention

- Protocol per species (overview, details, maturity, etc)
- Calibration of equipment (camaras, light, screens etc.)
- Calibration of colour
- Fast computation systems

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3 image collections

Photo databases at Naktuinbouw

- 245 crop databases vegetative propagated (mainly ornamentals) linked with database with characteristics
- 80 crop database seed propagated (mainly vegetables) not linked with database with characteristics

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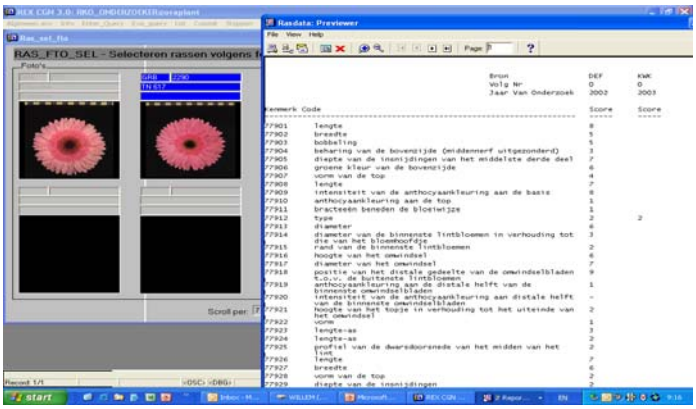
3 image collections

- Selection of comparing varieties based on characteristics



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4 Walking reference collections

Crop experts

- Advise on choice of comparison varieties
- Before and/or during trials (carnation, tulip, *Freesia*)
- No influence on final DUS report
- Objective
- Confidential

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4 Walking reference collections

Advantages

- Efficient
- Cost effective
- Broad reference (less chance of failure due to lack of reference varieties)

Disadvantages

- ???

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5 DNA-databases -- Reasons

- Alternative way to observe characteristics (under discussion)
- Help for selection of reference varieties (under discussion)
- DUS-testing decentralized; way of exchanging information
- Support in case of infringement cases
- Fast way of (pre-)identification of comparing varieties
- Support decision Distinctness (under discussion)
- Support decision Uniformity in case of maintenance (under discussion)

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5 DNA-databases -- examples

- Crop databases (Simple sequence repeat (SSR, microsatellites)) in Potato and *Phalaenopsis*
- Crop databases (Amplified Fragment Length Polymorphisms (AFLP)) in Pepper, Bean, Carrot, Lettuce)
- Ad hoc testing (Amplified Fragment Length Polymorphisms (AFLP)) in numerous crops
- Developing markers for plant disease characteristics in Nematode Resistance and Tomato Mosaic Virus Resistance
- Developing markers for pests

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Conclusion

- Long and wide experience available in the Netherlands
- A well-considered combination of Living Variety collections, Databases and descriptions, image collections, Walking reference collections, DNA-databases must be defined per species

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Quality in Horticulture