Completeness and relevance of Variety collections in DUS examination
(from Naktuinbouw perspective)

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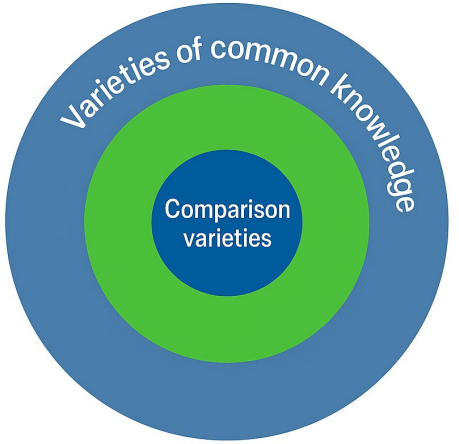
22 april 2026

Why variety collections for DUS trials?

A new variety must be clearly distinct from all ‘varieties of common knowledge’.

Since there can be a great many of them, a variety collection helps to:

- Map all relevant varieties of common knowledge
- Select which varieties are needed for comparison
- Practically determine which varieties should be included in a trial field or test as similar variety



Varieties of common knowledge
Variety collection
Comparison varieties

Basic UPOV guidance

- Article 7 of UPOV 1991 Act
- TGP/4: Constitution and maintenance of variety collections (2008)

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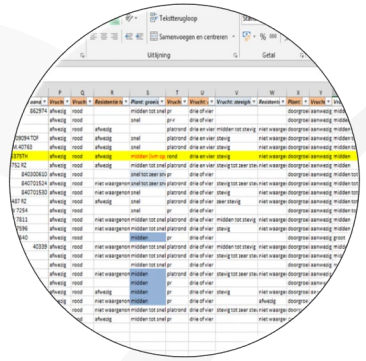
Living collections

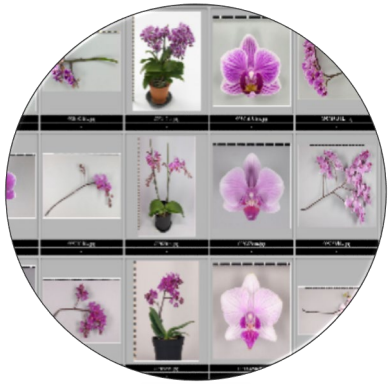
- Seeds

- Plants & trees

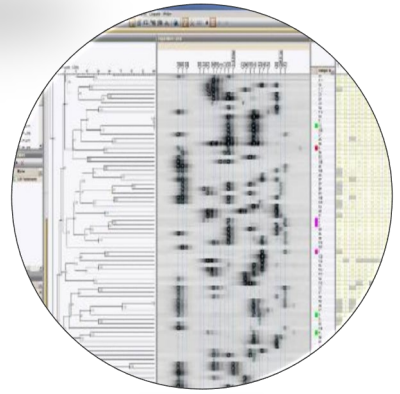
Non-living collections



- Variety descriptions



- Photos



- DNA

- External crop experts
  (Walking variety collections)

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Seed collections (living)

- Facilities & finances needed to store and maintain
- Not much space for storage
- Easy to send
- Exchange can be hampered by Phyto legislation and/or consent from breeder

Main challenges

- Renewal of samples (in principle every 5-10 years; depending on germination capacity of crop; incl. verification)

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Plant collections (living)

- Field or greenhouse facilities to store and maintain
- Needs much space for storage
- Use of external collections possible (e.g. bulb collection of KAVB)
- Specific growing conditions and cultivation knowledge required
- Exchange can be hampered by Phyto legislation and/or consent from breeder
- Testing for diseases sometimes necessary

Main challenges

- Space: completeness is generally impossible!
- Maintenance (renewal material & verification, keep free from diseases etc.)

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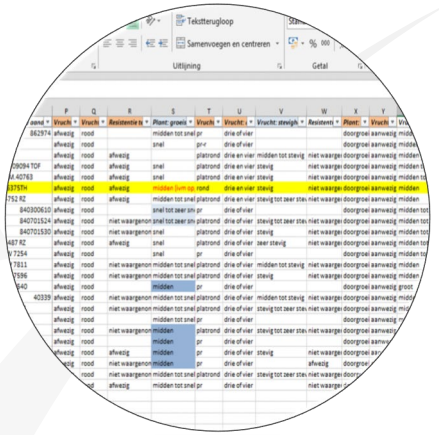
Variety descriptions



- Needs software for storage and search similar varieties
- No restrictions in storage
- Exchange with others is easy
- Use of external descriptions is limited (inhouse descriptions recommended)
- Preferably official DUS descriptions, but also non-official descriptions useful

Main challenges

- Get descriptions from other authorities in your own database
- Make inhouse descriptions (also variety that are not applied in own country)
- Adaption of old descriptions in case of revision of test guidelines

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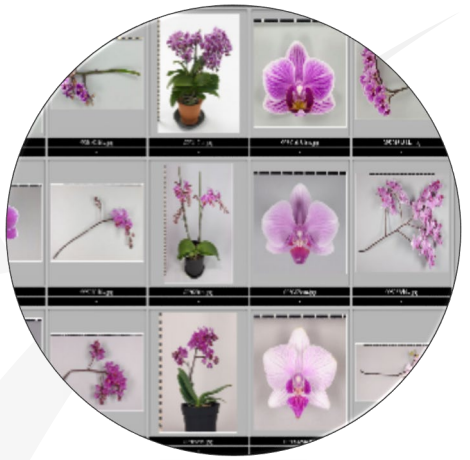
Photo collections



- Needs software for storage and search similar varieties
- Not much restrictions of space for storage
- Exchange of photo files easy
- Standardisation of light and background recommended
- Connection to description is recommended

Main challenges

- Interpretation of pictures (especially from other authorities; different light, etc.)
- In case of high numbers, search for similar varieties is time consuming (>AI project)
- Find material in case of a match (maybe variety does not exist anymore)

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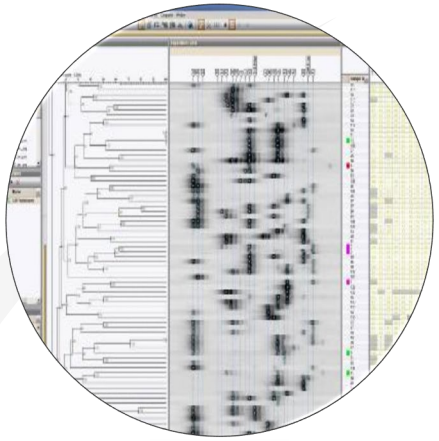
DNA collections



- Needs database and standard marker-set
- Development is expensive (centralized databases important)
- Restricted to specific crops (too expensive for small crops; for some crops not yet possible, e.g. tulips)
- No restrictions in space for storage
- Often no correlation to morphology

Main challenges

- Consent from breeder for exchange (administrative burden and sometimes no permission)
- Different marker sets and methods at different examination offices (exchange is restricted)

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External crop experts (Walking variety collections)

- Needs independent specialist with much knowledge of varieties of the crop
- Physical distance to visit the trial (NL is privileged to be small!)
- Only for advice on distinctness; the decision will be made by the examiner
- Normally the visit is during the trial, so their suggestions for an extra similar variety can lead to an extra year of testing
- Mainly used for ornamentals

Main challenges

- Availability of suitable persons
- It is difficult to remember the increasing number of varieties with the human brain

Maintenance of collections

- Completeness and proper maintenance (renewal, data updates) are essential for reliable DUS examination.
- Therefore, international cooperation and networks are fundamental (Naktuinbouw has huge network)
- Proper naming is essential (there are many synonyms and trade names; prevent duplicates in your collection).

Regular maintenance work:

- Inventory of new varieties of common knowledge (also from outside our territory)
- Inclusion of new relevant varieties in collections
- Rejuvenate living collections (replacement of too old plants/seeds)
- Inventory of ‘dead’ varieties (varieties that don’t exist anymore)

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Exchange of collection material and cooperation

- Exchange of collection material is crucial to avoid gaps (and share knowledge)
- Therefore, international cooperation and networks are fundamental
- Exchange of living material and DNA can be hampered by Phyto legislation and/or consent from breeder (much administration!)
- Shared collections or databases are a possibility to work more efficient (e.g. melon and potato)

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Overall conclusions

- All collection types are relevant depending on crop; combinations provide best completeness.
- Completeness and proper maintenance (renewal, data updates) are essential for reliable DUS examination.
- International cooperation and exchange are crucial to avoid gaps and share knowledge.
- Breeder consent is administrative burden and can be limiting to exchange living material and DNA.
- Rapidly increasing numbers of varieties make that:
  - efficient tools are indispensable (AI, DNA databases)
  - living (plant) collections become less feasible at large scale; DNA and digital tools gain importance.
  - more and more varieties become extincted (after match of variety in non-living collection, no inclusion as comparison variety possible)

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