UPOV

International Union for the Protection of New Varieties of Plants

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Technical Working Party for Ornamental Plants and Forest Trees **TWO/52/8**

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NEW ISSUES ARISING FOR DUS EXAMINATION

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The annex to this document contains a copy of a presentation "Resistance in ornamental crops", prepared by an expert from the Netherlands, to be considered by the fifty-second session of the Technical Working Party for Ornamental Plants and Forest Trees (TWO).

[Annex follows]

Resistance in ornamental crops

Naktuinbouw

Resistance is important

Resistance is important for growers and consumers

- Consumers prefer disease-free products, without residu of chemicals and for a reasonable price
- Diseases influence yield, but also visual quality
- Growers prefer resistant varieties with no or reduced damage due to disease

Breeding for resistance

- Lot of effort is being put into breeding for disease resistance
- Main breeding goal in vegetables
- Also in ornamentals resistance is a main breeding goal
  - Example: resistance to *Puccinia horiana* in Chrysanthemum
  - Example: resistance to *Fusarium oxysporum* f.sp. *chrysanthemi* in Chrysanthemum
  - Example: resistance to *Fusarium oxysporum* f.sp. *dianthi* in carnation

Resistance is important in DUS

- DUS should follow innovation (resistance) in plant breeding
- A variety description which includes resistance avoids ambiguous communication to growers (due to different pathotypes of a disease and different levels of resistance)
- Resistance characteristics may add Distinctness
- Resistances may lower costs of DUS trials due to less similar varieties (in crops with many morphologically close varieties)
- Resistance tests are developed during the breeding process
- Harmonized resistance tests are used in DUS

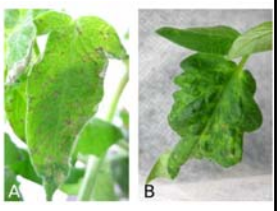
Cooperation with breeders

- Which disease is important? Does the diseases have different forms, like pathotypes, races, isolates?
- Who can perform the resistance test to check information in the TQ? Preferably a fast test on young plants.
- What do breeders know about their genetic sources?
- What do breeders know about the relation between damage and loss in a production environment and symptoms in young plants?
- Do breeders agree with the proposed resistance test protocol? Necessary to get reliable claims for resistance in the TQ.

Plantum

General requirements of resistance characteristics

- Symptoms of the disease (phenotype)
  - Symptoms shown in a continuous or discrete scale?
  - Is the observation scale one-dimensional?
- Interpretation of data in terms of UPOV characteristics
  - Data of the observation scale are translated into a reduced number UPOV states
  - Each state is reproducible and useful for distinctness
  - Each state is represented by at least one example variety
- Preferably: Genetics of the resistance (genotype)



A resistant B susceptible

UPOV guidance

TGP/12:

- all elements to take into account when considering a resistance characteristic
- a standard resistance protocol in the explanation of the characteristic, to be included in the UPOV guideline

Example:
Resistance to *Puccinia horiana* in Chrysanthemum

Genetics of resistance is not easily tractable due to complexity of hexaploid genetics.

At least 7 major genes for resistance may be present in current cultivars.

A phenotypic scale has been proposed by De Backer et al., 2011

Class	Phenotype	Interpretation
0	no pustules	Resistant
1	1-10 pustules	Resistant
2	more than 10 pustules	Susceptible

This scale was validated for three cuttings per variety.

Escapes are allowed.

Resistance to *Puccinia horiana* in Chrysanthemum continued

- Resistance is dependent on the choice of isolate
- Different isolates are present in different countries
- Isolates belong to races (defined by virulence pattern)
- Differential set should be available to DUS stations
- Differentials should be shared between companies
- Current action:
  - ringtest with 2 isolates and 2-6 candidate differentials
  - 4 partners

Call for participation

Do you want to participate in the ring test with *P. horiana*?

Please contact Diederik Smilde or Marco Hoffmann at Naktuinbouw

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[End of Annex and of document]