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APPLICATIONS FOR VARIETIES WITH LOW GERMINATION
(REVISION OF DOCUMENT TGP/7)

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1. Certain types of inbred lines (often parent lines) have a low germination rate. These varieties are not marketed, but have a high value for breeding purposes. Therefore, breeders may wish to obtain breeders' rights for such varieties.

2. The aim of this document is to present a proposal to define the minimum standards for candidate varieties that are not to be marketed.

UPOV Guidance

3. In relevant UPOV Test Guidelines there is a paragraph about germination requirements:

Text from UPOV Test Guidelines before the adoption of document TGP/7/1 "Development of Test Guidelines"

> "The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing seed in the country in which the application is made. The germination capacity should be as high as possible."

Text in UPOV Test Guidelines according to document TGP/7/1 ASW 1 – "Seed Quality Requirements" (a)

> "The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where

the seed is to be stored, the germination capacity should be as high as possible and should be stated by the applicant."

4. In the "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" document TG/1/3 nothing in particular is said about this subject. The text about the material to be submitted states the following:

"2.5.1 Representative Plant Material

"The material to be submitted for the examination of DUS should be representative of the candidate variety. In the case of varieties with a particular cycle of propagation, such as hybrid and synthetic varieties, this means that the material tested should include the final stage in the cycle of propagation.

"2.5.2 General Health of Submitted Material

"The plant material submitted for examination should be visibly healthy, not lacking in
vigor or affected by any important pests or diseases and, in the case of seed, should have sufficient germination capacity for the conduct of a satisfactory examination.

"2.5.3 Factors That May Affect the Expression of the Characteristics of a Variety

"The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc. In some cases (e.g. disease resistance), reaction to certain factors is intentionally used (see Chapter 4, section 4.6.1) as a characteristic in the DUS examination. However, where the factor is not intended for DUS examination, it is important that its influence does not distort the DUS examination. Accordingly, depending on the circumstances, the testing authority should ensure either that:

(a) the varieties under test are all free of such factors or,

(b) that all varieties included in the DUS test, including varieties of common knowledge, are subject to the same factor and that it has an equal effect on all varieties or,

(c) in cases where a satisfactory examination could still be undertaken, the affected characteristics are excluded from the DUS examination unless the true expression of the characteristic of the plant genotype can be determined, notwithstanding the presence of the factor."

Conclusion

5. Document TG/1/3 does not specify the germination of the submitted seed. The implementation of germination standards is the responsibility of the competent authority.

Background information from Naktuinbouw

Germination standards for inbred lines

6. In general, the competent authorities specify the requirements as they apply for certification or marketing. The Community Plant Variety Office (CPVO) refers in its protocols to the EU marketing directive for seed requirements: In directive 2002/55/EC Annex II, conditions to be satisfied for seed-propagated material and minimum germination

requirements are given. Compared to germination standards for professional growers, these requirements are quite low.

7. Low germination usually occurs in inbred lines, and is usually a consequence of inbreeding. Technically, it is not always possible to obtain the prescribed minimal germination percentage. If these lines will not be brought into commercialization, there is no problem for the applicant. The matter to be addressed is whether requirements for germination for such varieties should be the same as for varieties which will be marketed. Germination requirements could be lower.

8. If the germination is lower, vitality will usually be lower. This could influence the plant development such that some of the characteristics may be influenced and a proper and reliable comparison against other varieties with regard to those characteristics may not be possible. In addition, the storage of the seed will affect germination and the seed might not meet conditions for reference purposes in a reliable DUS test. On the other hand, other characteristics will not be influenced and observations could still be made on those characteristics.

9. An example in melon: inbred lines usually have a lower germination, around 20% less than hybrid standard seed. The germination of many of the seeds will be delayed, some will not emerge and many will emerge more slowly. This will affect the plant characteristics (including time of flowering), but not the leaf and fruit characteristics.

10. In view of the above, it is advisable to allow lower germination requirements only in special cases when during the trial this does not pose problems with regard to a reliable comparison and to observation of characteristics and of uniformity. In practice, this will mean that after sowing a certain percentage of viable plants must be obtained or, if the germination is slower, this should not affect important (asterisked or grouping) characteristics. Characteristics which are affected should not be described. The applicant should be made aware that he runs the risk that the application could be rejected due to the aforementioned problems.

Proposal

11. Definition of applications for varieties with low germination:

- Varieties to be marketed: to follow the marketing directive (in cases that there is a marketing directive available)

- Varieties not to be marketed as indicated by the applicant: at the moment of application, follow the guidance as described below concerning inbred lines (parent lines), but only for inbred lines with low germination

Guidance for inbred lines with low germination

12. Minimum germination standards for candidate varieties (not to be marketed):
- Number of plants must be sufficient for testing
- Vitality of the plants must be sufficient
- To be judged by inspector from the competent authority

Examples[1]

- Egg plant: 20 seeds, only 2 germinated. This is not sufficient.
- Egg plant: 100 seeds, 20 germinated, of which 16 vital. This is not sufficient.
- Egg plant: 100 seeds, 20 germinated, of which 20 vital. This is sufficient.
- Melon: germination rate from parent lines tested was between 61% and 67%. This is sufficient if at least 43 seeds are sown.

Vitality

13. If, after germination, the vitality of the remaining plants is not sufficient to judge a sufficient number of plants according the corresponding UPOV Test Guidelines, the application should be rejected.

Uniformity

14. There is a risk for varieties with a low germination that there will be an unrepresentative selection of genotype (for example if the seeds do not germinate uniformly over time): this creates a doubt concerning uniformity. It is not possible to fully exclude this type of selection, however it is possible to minimize the risk.

15. Possible approaches to minimize this risk for parent lines in the case of doubt concerning uniformity:

(a) If the germination is not uniform, the inspector must decide if the early- and late-germinated plants should be judged in the trial together or if the late-germinated plants should be observed in a separate replicate in the same field trial. The latter is advised.

(b) Comparison of the results of at least two trials.

(c) Judgment of uniformity of hybrids from the inbred/parent line, in case of doubt.

(d) Molecular techniques are not advised. It is a costly procedure and if non-uniformity is found in the genome it is not clear if this non-uniformity is linked with morphology.

(e) Biochemical techniques: see explanation for molecular techniques

(f) Other techniques or methods?

Conclusions

- Applications for varieties with a low germination rate can be examined for DUS in conformity with UPOV principles.

- In case of doubt, there may be need to be extra trials with extra costs.

[End of document]

[1] The Test Guidelines (document TG/117/4 (Egg plant), see Chapter III.3 and TG/104/5 (Melon), see Chapter 3.5) indicate that each test should be designed to result in a total of at least 20 plants.