

The forty-ninth session of the
Technical Committee (TC/49)
agenda item 3 (a): Discussion on Molecular Techniques

Introduction to the use of biochemical and molecular markers in the DUS examination

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APPLICATION MODELS (TGP/15/1 Draft 4)

1. Characteristic-specific molecular markers

“**Molecular markers** can be used as a method of examining DUS characteristics [...], on the following basis:

- (a) the test for the marker is conducted on the same number of individual plants, with the same criteria for distinctness, uniformity and stability as for the examination of the characteristic by a bioassay;
- (b) there is verification of the reliability of the link between the marker and the characteristic;
- (c) different markers for the same characteristic are different methods for examining the same characteristic;
- (d) markers linked to different genes conferring expression of the same characteristic are different methods for examining the same characteristic; and
- (e) markers linked to different regulatory elements for the same gene conferring expression of the same characteristic are different methods for examining the same characteristic.

The presentations by the **United Kingdom** on barley and **France** on sugar beat provide examples of the use of this model.

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APPLICATION MODELS (TGP/15/1 Draft 4)

2. Combining phenotypic and molecular distances in the management of variety collections

“A combination of phenotypic differences and molecular distances” can be used to identify within the variety collection, those varieties which need to be compared with candidate varieties in order to improve the selection of “Distinct plus” varieties, on the following basis:

- (a) there is reliable information that the molecular distances are sufficiently related to phenotypic differences, such that
- (b) the method selects varieties in the variety collection which are similar to the candidate varieties; and
- (c) the method does not create an increased risk of not selecting a variety in the variety collection which needs to be compared to the candidate varieties in the field.

The presentation by **France** provides an example of the use of this model on maize, barley and lettuce.

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Importance of harmonized approach

Harmonization

- ⇒ facilitates cooperation in DUS testing
e.g. purchase of DUS reports
- ⇒ internationally recognized variety descriptions (effective protection)

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Other applications of molecular techniques

The presentations by the [Netherlands](#), [Brazil](#) and [France](#) provide other examples of applications of molecular techniques.

ex.)

- Use of molecular techniques for the renewal of reference materials
- Identification of genetic profile of protected varieties/reference collections etc.