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TWA/27/20
ORIGINAL: English
DATE: May 26, 1998

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

Twenty-Seventh Session
Angers, France, June 23 to 26, 1998

PRESCREENING OF VARIETIES: PROGRESS REPORT OF A CASE STUDY IN *POA PRATENSIS* AND *SOLANUM TUBEROSUM*

Document prepared by experts from the Netherlands

PRESCREENING OF VARIETIES: PROGRESS REPORT OF A CASE STUDY IN *POA PRATENSIS* AND *SOLANUM TUBEROSUM*

(See also TWA/25/7, paragraphs 17-24 of TWA/25/13 and TWA/26/10).

A. *Poa pratensis*.

The database for *Poa pratensis* contains the morphological description and the electrophoretic pattern of 270 varieties. The prescreening procedure is as follows:

1. In the beginning of January the candidate varieties are seeded in a seedling trial in the greenhouse, together with 15 standard varieties.

   At the same time the electrophoretic pattern is established by the IEF method on the seed.

2. After 6 weeks the plants are scored for 6 seedling characteristics, number 1-6 of TG/33/6.

3. The scores for each variety are compared with the scores of all varieties in the database, by a special computer program. Those varieties are printed of which the difference in two of the six characteristics is only one class or less.
   This greenhouse trial shows sufficient reliability from year to year in order to compare the results from different years.

4. The electrophoretic pattern of the candidate variety is compared with the electrophoretic pattern of these close reference varieties.

5. If there is no clear difference, the reference variety is planted in the spaced plant trial adjacent to the candidate variety.
   If there is a clear difference, the reference variety is to be regarded sufficiently distinct from the reference variety on the basis of the difference(s) of the seedling characteristic(s). On this basis the reference variety can be left out of the spaced plant trial.

6. All 270 varieties will be sown in the row trial, as a living database. This offers the opportunity of a field comparison of the candidate variety with all reference varieties. in the unlikely event, that a reference variety has been overlooked, it can be planted in the second year.

   The results with the candidate varieties in 1998 have shown 10 varieties with an unclear difference on the basis of seedling characteristics. 4 of these varieties were also not different in their electrophoretic pattern. The other 6 varieties appeared to have an electrophoretic pattern clearly different from the printed reference varieties. All other candidate varieties in test, 15 in total have also been screened on electrophoretic resemblance. They have all been found clearly different from all reference varieties. This confirms the differences found between these candidate varieties and the reference varieties on the basis of the seedling characteristics which are stored in the morphological descriptor database. This means, that in principle, only 4 reference varieties, on top of the 15 standard varieties, have to be planted in the spaced plant trial.

B. ***Solanum tuberosum***

The database for potato contains the morphological description, the photograph of the lightsprout and the electrophoretic pattern of respectively 725, 542 and 670 varieties.
The prescreening procedure is as follows:

1. The candidate and 25 standard varieties are put in the lightsprout trial, at the beginning of January. Characteristic 47 of TG/23/5, the tuber color of skin, is directly scored from the tuber.
   At the same time the electrophoretic pattern is established by the IEF method on the tuber.

2. After 6 weeks the expression of the 12 lightsprout characteristics, number 1-12 of TG 23/5 can be scored.

3. The scores for each variety of the 13 characteristics are compared with the scores of all varieties in the database, by a special computer program. Those varieties are printed of which the difference in 3 characteristics is only one class or less.
   The lightsprout trial, performed in a closed room at a controlled temperature and low light intensity, has shown very reliable results over the different years.

4. The lightsprout photographs and the electrophoretic patterns of the printed varieties are compared with the photograph and the electrophoretic pattern of the candidate variety.

5. If there is no clear difference, the reference variety is planted in the spaced plant trial adjacent to the candidate variety.
   If there is a clear difference, the reference variety is to be regarded sufficiently distinct from the reference variety on the basis of the difference(s) of the lightsprout and tuber characteristic(s). On this basis the reference variety can be left out of the spaced plant trial.

6. The complete set of scores of all 50 characteristics is compared with the full set of all varieties in the descriptive database after the first observation year. In case of doubt an extra comparison can be made between the lightsprout photographs and the electrophoretic patterns of the candidate variety and the relevant reference varieties.

   The results of 1998 comprise a few example cases. Only a few closely similar varieties have been selected on the basis of the 13 characteristics. The differences in the photographs are sometimes difficult to see. The difference in the electrophoretic pattern however can be very clear. It is to be expected that in potato only a few problem cases, mainly mutants or possibly GMO’s, will occur.
   The varieties not printed in step 3 and the varieties having a sufficient difference according to step 5, may be left out of the trial.

   In this way the electrophoresis can be used to confirm the morphological differences between varieties, based on the routine guideline characteristics stored in the database, which can be observed and compared before the planting or seeding of the trial.

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