



TWC/26/29

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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**  
GENEVA

**TECHNICAL WORKING PARTY ON AUTOMATION AND  
COMPUTER PROGRAMS**

**Twenty-Sixth Session**  
**Jeju, Republic of Korea, September 2 to 5, 2008**

REPORT

*adopted by the  
Technical Working Party on Automation and Computer Programs*

Opening of the Session

1. The Technical Working Party on Automation and Computer Programs (TWC) held its twenty-sixth session in Jeju, Republic of Korea, from September 2 to 5, 2008. The list of participants is reproduced in Annex I to this report.
2. The TWC was welcomed by Mr. Il-Ho Cho, Director, Plant Variety Protection Division, Korea Seed and Variety Service (KSVS). A copy of his welcome address is provided in Annex II to this document.
3. The session was opened by Mrs. Sally Watson (United Kingdom), Chairperson of the TWC, who welcomed the participants.

Adoption of the Agenda

4. The TWC adopted the revised agenda as reproduced in document TWC/26/1 Rev., on the basis of the work program proposed by the Chairperson.

Short Reports on Developments in Plant Variety Protection*(a) Reports from members and observers*

5. Mr. Chan-Woong Park, DUS Examiner, Korea Seed and Variety Service (KSVS) made a presentation on plant breeders' rights in the Republic of Korea. A copy of the presentation is provided as Annex III to this report.

6. An expert from the Korea Forest Service (KFS) of the Republic of Korea reported that, in conformity with the Seed and Industrial Law, KFS was responsible for plant breeders' rights in the forestry sector, including trees, several fruit crops and ornamental plants and mushrooms. He explained that one month previously, the Korea Forest Seed and Variety Center (KFSVC) had been organized in the KFS; KFSVC was responsible for plant variety protection in the forestry sector. In conformity with Article 11 of the Seed and Industrial Law, forest species, including chestnut and mushrooms, were eligible for protection by ordinance of the Ministry of Food, Agriculture and Forestry. He added that, up to that time, 8 applications for varieties of chestnut and mushrooms had been filed, which were under DUS examination. He reported that KFSVC was aiming to develop test guidelines for many forest species.

7. An expert from Germany reported on increasing cooperation, particularly with neighboring countries, in the form of small projects on crops such as maize and more recently grasses. He explained that the first experiences of those projects had been very positive and offered to provide the TWC with more information once the projects were completed. He also informed the TWC that they were looking for a new data logger system.

8. The expert from Kenya reported that almost 1,000 applications for plant breeders' rights had been received since the introduction of the plant variety protection system in Kenya. However, at the time of reporting, only around 30% of applications had resulted in the grant of a plant breeder's right, with most of the other applications still with the Ministry of Agriculture.

9. An expert from France reported on a joint project in the European Union, involving France, Germany, Hungary, Ireland and Norway, for cooperation in the examination of Value for Cultivation and Use (VCU) turf-grass trials. First results were expected in 3 years. Another expert explained that there was increasing cooperation in the form of bilateral and multilateral arrangements, including within the framework of the Community Plant Variety Office of the European Community (CPVO). The aim of that work was to improve harmonization and to reduce costs whilst maintaining a high level of quality. He also explained that progress was being enhanced by the sharing of experiences outside meetings through electronic communications. An expert reported on work on the management of biochemical and molecular data and work on the optimization of the use of data loggers.

10. An expert from Finland informed the TWC that Finland had made a request to the CPVO for registration as an entrusted office for DUS examination and would be audited for that purpose in due course. He also reported that a seminar had been held to raise awareness about plant breeders' rights in Finland.

11. The expert from Denmark explained that a reorganization had taken place since January 1, 2007, with the Department of Variety Testing having been merged with the Danish Institute of Agriculture Science (DIAS) and all other departments having been merged with

the University of Aarhus, which meant that the Research Department of Variety Testing and the Research Unit of Statistics had been separated into two institutions. The post-control of varieties had been moved from its present location to Tystofte as a result of the reorganization.

12. The expert from the Czech Republic reported that there had been structural changes within the Central Institute for Supervising and Testing in Agriculture (UKZUZ) and that UKZUZ was being assessed for compliance with the International Standards Organization (ISO) standard ISO 9001: 2000. He also informed the TWC that the GAIA methodology being used for almost all main crops where it was appropriate, with DUST being used for measured characteristics.

13. An expert from China reported that the new Implementing Rules for the Regulations on the Protection of New Varieties of Plants (agriculture part) had been promulgated by the Ministry of Agriculture on September 19, 2007, and had entered into force on January 1, 2008, to adapt the new situation of the practical work. He explained that electronic application documents were required in the new implementing rules, that the application form had also been modified in accordance with the new implementing rules and that the old forms were no longer valid as of May 1, 2008. He added that the new regulation canceled the need for applicants to have a representative agent which had been authorized by the government; therefore, applicants could choose any natural person or company in China as their representative. He reported that, since September 2007, there had been a reduction in the fees for plant variety protection as follows: the application fee was reduced from 1,800RMB to 1,000RMB; the examination fee from 4,600RMB to 2,500RMB; and the annual fee was 1,000RMB per year for the first 6 years and 1,500RMB per year afterwards. There were no other fees. He explained that the seventh batch list of protectable genera or species of agricultural crops had been released on April 21, 2008, and had been implemented on June 1, 2008, extending the total number of genera or species eligible for protection to 146. He reported that up to July 31, the total number of applications filed during 2008 was 444, which was similar to the previous year; amongst those, 55 were from foreign applicants, which represented a considerable increase. The number of plant breeders' rights granted was 445, which also represented an increase compared to the previous year; amongst which 9 were from foreign applicants. From 1999 to 2008, the total number of applications was 5,629, the total number of plant breeders' rights granted was 1,854. He reported that the Sino-Dutch Project "DUS Testing in China" had been undertaken from 2007 to 2008. Through that project, 28 Chinese experts went to the Netherlands for training in 2007, and 6 experts from Naktuinbouw had been invited to provide training to more than 45 Chinese experts in 2008. Finally, he reported that, on July 21, 2008, an improved website of the PVP Office of the Ministry of Agriculture had been launched, together with the first launch of its English version; and that early in 2008, a project on developing a new database to integrate all the existing databases held by different divisions had started and would be finished before the end of 2009.

14. An expert from Brazil reported that the GAIA methodology was being evaluated for use in rice and wheat.

15. The expert from Australia reported that, since 1988, Australia had received over 5,800 applications for Plant Breeder's Rights and that during the 2007-2008 financial year, 372 new applications were filed and 216 certificates of grant were issued. He explained that, compared to the previous financial year, the number of applications received (353) was slightly higher than during the period 2006-2007, but that the number of grants was lower (261) than during the period 2006-2007. He added that drought in many parts of Australia over several years

might be the cause of a delay in some trials, with ornamental varieties appearing to be most affected; during the preceding 12 months, 50% of applications filed were for ornamental varieties whereas, in previous years, the figure had been around 60%. He reported that Australia continued to receive a significant number of applications for the first variety of a species, mainly being Australian species for which published knowledge of the morphological variation of the species was often sparse. That presented challenges in preparing national test guidelines and in identifying suitable reference varieties. As a result, the DUS trials were typically small, generally including only one or two other varieties. In other developments, he added that Australia was providing UPOV codes with its submissions for the UPOV-ROM and that the first two applications filed under PBR in Australia in 1988 had gone to full term and expired on May 5, 2008.

16. An expert from the United Kingdom explained that investigations were continuing into ways to improve testing, including the management of reference collections. Image analysis was being further developed and refined for both agricultural and vegetable crops as a means to achieve high quality and to improve efficiency. Cyclic planting was also being considered for some crops.

17. An expert from Romania reported that Romania had implemented amended Law 255 on the protection of new varieties of plants, and the new regulations, which were in line with the amended EU Regulation 2100/94. She explained that many efforts were being made by the Institute for Testing and Registration of Varieties (ISTIS) to improve the reference collections for the most important species, such as wheat, barley, maize, sunflower, and also for vegetables. She added that Romania had signed bilateral agreements with neighboring countries to improve cooperation in DUS testing of varieties for both plant breeder's rights and national listing. It was explained that ISTIS experts actively participated in some of the UPOV Technical Working Parties and in ring tests of the Community Plant Variety Office of the European Community (CPVO). At the request of the Government from Romania, a mission from the CPVO had visited Romania with a view to entrusting ISTIS to conduct DUS tests on behalf of the CPVO. She reported that a seminar on plant breeder's rights, organized by CPVO in cooperation with Rumanian authorities, would be held in Bucharest, on October 2, 2008 with the view to encouraging Romanian breeders and seed producers to protect their varieties via the CPVO. Finally, she reported that since 2000, 236 applications for plant breeder's rights had been filed at State Office for Inventions and Trademarks (OSIM) and 157 plant breeder's rights had been granted, of which 62 were for varieties of agricultural species, 50 for fruits and vines, 25 for vegetables, 8 for technical plants and 12 for medicinal plants.

18. The expert from Poland informed the TWC that, as a part of its program of cooperation, Poland had offered a training course for a Belarus expert. He also explained that Poland was continuing to investigate optimal testing arrangements by reviewing the number of years of testing, number of plants, plot size, number of replicates etc.. However, whilst aiming to reduce costs, the initial results tended to indicate that more years and plants would be beneficial.

19. The expert from the Netherlands reported that it was intended to pay more attention to harmonization and calibration of observations. Rules and protocols were available to calibrate observers and to test repeatability and reproducibility, but possibilities for improvements were being sought. In particular, means of improving harmonization of observers in different UPOV members was welcome. To improve harmonization in image analysis, different UPOV members had been visited, as a result of which methods used in the

Netherlands would be modified. In addition, it was intended to harmonize observations in grasses in order to be able to reduce the size of the reference collection. A statistical study was planned for that purpose with other UPOV members.

20. An expert from Japan informed the TWC that the Ministry of Agriculture, Forestry and Fisheries (MAFF) had reorganized the Plant Variety Protection and Seed Division and had established the Intellectual Property Division in August 2008. The Plant Variety Protection Office was reorganized as a new substructure division. He added that, in the fiscal year 2007, MAFF had received 1,533 applications and had granted 1,432 plant breeder's rights. Finally, he reported that the East Asian Plant Variety Protection forum had been established to improve the development of plant breeder's rights in Asia; its first meeting was held in Tokyo, on July 23, 2008. Forty-four participants had attended from 13 Members and 6 participants had attended from three other countries, one region and two organizations, who exchanged information on cooperation activities in plant breeders' rights in their countries. The forum was organized by Japan in cooperation with the Republic of Korea, China other countries and UPOV.

*(b) Reports on developments within UPOV*

21. The TWC received an oral report from the Office of the Union (the Office) on latest developments within UPOV, a copy of which is provided as Annex IV to this document.

22. In response to a question from an expert from France concerning the development of explanatory notes, the Office explained that, in 2005, the Administrative and Legal Committee (CAJ), had agreed an approach for the preparation of information materials concerning the UPOV Convention and to the establishment of an advisory group to the CAJ ("CAJ-AG") to assist in the preparation of documents concerning such materials. It was further explained that the CAJ-AG was composed of a group of experts from UPOV members and that the sessions of the CAJ-AG were open to members.

Molecular Techniques

23. The TWC received an oral report on developments within UPOV concerning molecular techniques, on the basis of document TWC/26/2.

24. The expert from the Netherlands requested clarification of the proposal presented in documents BMT/10/14 and BMT-TWA/Maize/2/11, which was to be put forward for consideration at the *Ad hoc* Subgroup of Technical and Legal Experts of Biochemical and Molecular Techniques (BMT Review Group) as a potential option for the use of molecular markers in DUS examination. In response to that request, the TWC invited Mr. Sylvain Grégoire (France) to make a presentation of the proposal, a copy of which is reproduced as document TWC/26/28. That presentation also contained information on an investigation into a similar approach for oilseed rape, which was also discussed in document TWC/26/18. Mr. Grégoire emphasized that the indication of minimum and higher GAIA thresholds of 6 and 2 in both maize and oilseed rape should not be assumed to be a general set of thresholds for such an approach in other crops and would need to be considered on a case-by-case basis.

25. In response to a question on how to achieve consistency in the thresholds and risks in the proposed approach, Mr. Grégoire explained that that could be addressed by robustness and

comparison of datasets at the computational level, but was also managed by comparing the outcomes when checked against expert opinions.

26. The expert from the Netherlands sought information on the possible use of breeder data and wondered if the line of relationship between GAIA distance and Roger's genetic distance in slide 18 might be varied according to the GAIA distance. Mr. Grégoire confirmed that data from the breeder might be used in the approach if there was confidence in the data which would be supplied. With regard to the line of relationship between GAIA distance and Roger's genetic distance, he agreed that it might be appropriate to have a sloping line to reflect the varying GAIA distance, rather than a vertical line; however, as a first stage, it was necessary to gain acceptance of the general approach before refinements were sought.

### TGP Documents

27. The TWC considered the TGP documents below in conjunction with documents TWC/26/3 and TWC/26/9.

(a) *New TGP documents:*

*TGP/8 Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability*

28. The TWC discussed documents TGP/8/1 Draft 10, TWC/26/11 Rev. and TWC/26/19 and agreed to propose the following changes to document TGP/8/1 Draft 10:

General	In relation to document TWC/26/3, paragraph 16(b), to consider if it would be necessary to conduct a comparison of the results of different statistical methods as a condition for their inclusion in TGP/8, the TWC agreed that a review by the relevant experts in the TWC would be an appropriate way of ensuring that unsuitable methods would not be included in document TGP/8.
<u>PART I</u>	
1.1	to clarify that when statistical analysis is used for DUS examination, the information provided in the Test Guidelines may not be sufficient and that additional factors may need to be considered.
1.2.2.7	to improve the text for better coherence with the preceding paragraphs.
1.3.1.2	to verify the cross reference
1.3.2.5	to request the TWPs to check whether this approach is used
1.5.3	to check whether third sentence is appropriate
1.6	to replace "replicated plots" with appropriate term, e.g. "replicate plots", "replicate" or "replicated trials". To be checked throughout TGP/8.
1.6.1.2	to delete the first three sentences
1.6.1.5	to read "TGP/7 Development of Test Guidelines ASW 5 Plot design identifies the following types of DUS trial:" and to amend the title of (c) to "Replicates"
1.6.1.7	To read as follows:

	<p>“1.6.1.7 Replicated trials are suitable when the assessment of distinctness requires, for at least some characteristics, the calculation of a variety mean by observation or measurement of groups of plants (see TGP/9 section 4.3.2.4)[<i>cross ref.</i>]. In such cases, uniformity is, in general, assessed on the basis of off-types. Common examples of this are self pollinated agricultural crops (e.g. cereals).”</p>
1.6.1.8	<p>First sentence to read as follows (new text underlined; deleted text strikethrough):</p> <p>“Replicate plots are appropriate when records for a number of single, individual plants or parts of plants are required for statistical analysis of individual plant data for the assessment of distinctness, for at least some characteristics (normally quantitative characteristics) (see TGP/9 section 4.3.3)[<i>cross ref.</i>].”</p>
1.6.1.9	<p>The text in the third box from the top on the first column on the left to read as follows (new text underlined; deleted text strikethrough): “Variety mean Statistical analysis of group data (MG/MS)”</p>
1.6.3.2	<p>title to read “Replicate plots for group data records”</p>
1.6.3.2.1	<p>to read “When the assessment of distinctness requires the use of variety means or statistical analysis of records for groups of plants, replicated plots are used. Each replication will include all varieties in the trial and the varieties will be randomly allocated to plots. They can be used to obtain a single record of a group of plants or parts of plants (see section 1.6.1.7) to calculate the variety mean or for statistical analysis of individual group data (e.g. cereals). It is important to note that, in general, a single record of a group of plants or parts of plants, when obtained by visual observation, provides qualitative scaled data (see section 2.5.4.2) which does not allow for the calculation of arithmetical means.”</p>
1.6.3.2.2	<p>The explanations of Example 1 and Example 2 to start with “If there is evidence that...”</p>
1.6.3.3.1	<p>The third sentence to read as follows: The allocation of varieties to plots will involve randomization (see section 1.3.4).</p>
1.6.3.4	<p>In reply to a comment made by the TWA, the TWC confirmed that this section was useful in relation to specific circumstances of DUS testing and should be maintained in TGP/8.</p>
1.6.3.5	<p>In reply to a comment made by the TWA, the TWC agreed that it would be very difficult to give guidance on optimal sub-block size, because it depends on different factors, such as the variability of the soil and the differing susceptibilities of characteristics to that variability. However, if there was no information available, e.g. from the first trial, the applicable number of sub-blocks could be calculated as a whole number close to the square root of the number of varieties, e.g. 100 varieties would require 10 sub-blocks.</p>
1.6.3.5.1	<p>The seventh sentence to read as follows:</p> <p>“One of the features of generalized lattice designs is that the incomplete blocks form a whole replicate.”</p>
1.6.3.5.2	<p>Block III to be indicated correctly.</p>
1.6.3.7	<p>Title to read as follows: Further statistical aspects of trial design”</p>
1.6.3.7.1.1	<p>Second sentence to be deleted</p>

1.6.3.7.1.2	To be moved after section 1.6.3.4.
1.6.3.7.2	Mr. Adrian Roberts (United Kingdom) to circulate a new draft of section 1.6.3.7.2 to the TWC by October 31, 2008, with an invitation for comments by November 30, 2008. Mr. Roberts to provide a new draft of that section to the Office by December 31, 2008. In particular, to replace the word “decision” and the phrase “if all plants of a variety...”.
1.6.3.7.2.7 & 8	To include the symbol “ $\beta$ ” in the table
1.6.3.7.3	Mrs. Sally Watson (United Kingdom) to edit the title and text and to merge with section 1.6.3.7.4. New draft to be circulated according to the timetable set for Section 1.6.3.7.2.
1.6.3.8.3.2	First sentence to start: “When distinctness is assessed by statistical analysis.....”
1.6.3.8.6	To delete the text in square brackets and strikethrough.
1.7	To check the reference.
1.8	To read: “Changes in the methods.....”
2.2, 2.3	To be edited (e.g. “visually” to read “visual”)
2.3.1	Second sentence to read: “In these cases, the trial design consists of single plots, there is a single record per variety, which is obtained from visual observation of a group of plants or part of plants .....”
2.4	Title to read as follows: “Variety mean/statistical analysis of group data”
2.5	To explain that this section covers all type of data, including data from qualitative characteristics.  Table 1: to make link between process levels and type of expression (QL, QN, PQ) (level 1) and method of observation (VG, VS, MG, MS) (level 2).  Mr. Uwe Meyer (Germany) to revise and restructure the section starting from the perspective of characteristics as viewed by DUS experts e.g. using Tables 2 and 3 and to include examples for clarification. Draft to be circulated to the TWC by October 15, 2008, for comments by the TWC by November 12, with final draft to be provided to the Office by November 28, 2008.  Table 3 (combined): it was noted that there should not be a “qualitative” step in a pseudo-qualitative characteristic.  To delete “Part II follows” at the end of the section.
3	Mr. Gerie van der Heijden (Netherlands) will consult his Naktuinbouw colleagues in the Netherlands to see if they could contribute a draft for this section.
4.1	To include in the introduction reference to VG, VS, MG and MS.
4.1.1	In the second sentence, to read “single plant” instead of “single variety”.
4.1.2	To be moved to section 4.3 and to be checked
4.2	To add that, in statistical methods, the validation of assumptions can also be used as a check that the data are without mistakes (see Section 4.3.2.1.1)



4.2.2	To include the additional explanation from TGP/8/1 Draft 8, paragraph 3.1.4.
4.2.3	states to be checked (ovoid indicated for both notes 2 and 3)
4.2.5	First sentence to read : “Other types of graphical plot may also...”
4.3	Mrs. Sally Watson (United Kingdom) to edit the text and to include relevant text from section 3.1.3 from TGP/8/1 draft 8.
4.3.1	Title to read: “Assumptions for statistical analysis [/variety means] involving analysis of variance” To include assumption for other types of analysis
4.3.1.3	To format the two sub-paragraphs as bullet points.
New 5	“Choice of statistical methods for examining Distinctness”: see comments on Part II, Section 3.1
New 6	“Data processing for the assessment of distinctness and for producing variety descriptions” (see comments on agenda item “Handling measured, quantitative characteristics”)

<u>PART II</u>	
1. and 2.	to introduce a main section title to cover the GAIA methodology and parent formula of hybrid varieties
3.	to delete reference to parametric and non-parametric methods
3.1	the Office, in conjunction with Mr. Gerie van der Heijden (Netherlands) and Mr. Adrian Roberts (United Kingdom), to prepare a flow diagram / decision tree for guidance on suitable methods for examining distinctness (avoiding comparison of methods) and to become a new section 5 in TGP/8 Part I. To explain that, within the same variety, different methods for examining distinctness may be used for different characteristics.
3.2 to 3.7	(a) to reorganize the order of statistical methods according to the order to be created in the flow diagram (see above) (b) to create a subsection “Conditions to be fulfilled” at the beginning of each method
3.1.3	to be deleted
3.1.5	to be deleted
3.4	to be deleted
3.5	Mr. Gerie van der Heijden (Netherlands) to prepare a draft for this section. Draft to be circulated to the TWC by October 15, 2008, for comments by the TWC by November 12, with final draft to be provided to the Office by November 28, 2008.
3.6, 3.7	To be replaced by the new text to be developed by Australia based on TWC/26/11 Rev., paragraphs 14 to 43, incorporating the comments made by the TWC below.
4.1.1.11	(a) Office to review the combinations of population standards and acceptance probabilities found in the adopted Test Guidelines. Tables for combinations of

	<p>population standards and acceptance probabilities not found in the adopted Test Guidelines to be deleted;</p> <p>(b) to reorder tables to group according to first rank: population standard (highest to lowest); second rank: acceptance probability (highest to lowest) and to improve the quality of the graphics</p>
(new after 4.2)	<p>Relative variance method to be added as new Section 4.3 on the basis of document TWC/26/19, amended as follows:</p> <p>(a) to delete paragraphs 1 to 4;</p> <p>(b) to explain that the “comparator” (reference) varieties in this method are the varieties used as comparators for the assessment of distinctness;</p> <p>(c) to explain that, if problems with uniformity are found after one growing cycle, the variety will be examined in a second growing cycle;</p> <p>(d) to explain that the variances are the candidate variety and the average variances of the comparators;</p> <p>(e) Table 1, paragraph 10: to explain that the table is intended for use as a rough guide in the field and that the correct threshold limit should be used for the exact sample size.</p>

29. The TWC propose the following amendments to document TWC/26/11Rev. prior to incorporation of the explanation of the Chi-square Test and Fisher’s Exact Test (based on paragraphs 14 to 43) in document TGP/8:

<u>Introduction</u>	
3.	<p>The TWC considered that the term “assumptions”, in the context of this paragraph, was not correct. An expert from the United Kingdom considered that the term “conditions” would be more appropriate.</p> <p>The TWC agreed that the second bullet point of paragraph 3 should read as follows (new text underlined; deleted text strikethrough): “The underlying <del>statistical assumptions</del> <u>conditions</u> needed by the parametric methods are not met or are untested. To modify the wording throughout the document accordingly”</p>
4.	To delete paragraph 4, to eliminate the comparisons between parametric and non-parametric and to explain that non-parametric method have assumptions which should be validated, e.g. independence of observations.
	In reply to a comment made by an expert from the United Kingdom recalling that when data are analyzed over years it was necessary to establish a model, the expert from Australia explained that in his country non-parametric methods were used in within-year tests, in cases where there were very few reference varieties.
6., 7.	<p>Some experts considered that non-parametric methods could be applied to scale data other than nominal scaled. The expert from the Netherlands noted that TGP/8/1 Part II Section 3.5 dealt with situations of small sample sizes and, therefore, there was no need to refer to them in another section.</p> <p>The TWC agreed to delete the second sentence of paragraph 6 and to delete the whole paragraph 7.</p>

	<u>Role of non-parametric analysis for analyzing quantitative data</u>
8.	Following the agreement on paragraph 3 the TWC agreed to replace “assumptions” by “conditions” and to delete the term “badly violated”.
	<u>Role of non-parametric analysis for analyzing qualitative data</u>
9	Following the recommendation of the expert from Netherlands the TWC agreed to include reference to threshold models in paragraph 8.  The TWC further agreed that the examples included in the document should be revised to include situations resulting from UPOV Test Guidelines.
13	to delete “commonly”
	<u>Chi square test</u>
	The expert from Denmark considered that the title was too generic, because there are other methods involving the Chi square test than the one included in the document. The expert from Germany explained that in the case of ordinal scale data Chi square test was a test which did not allow the determination of whether a difference was due to a different position or ‘location’ of the distributions under comparison or whether it was a difference in the dispersion of the distributions, in which case two distributions might be considered different, whilst having the same mean. He expressed some concerns for this second situation when assessing distinctness.
	An expert from France wondered whether the statement that stability could be assessed was correct.
	The TWC agreed that the title “Chi Square” be replaced by “Contingency table”, to delete the reference to stability in paragraph 16 and the elements which related to stability from the example.
17.	The TWC agreed to delete the first sentence from paragraph 17, and to make a new paragraph starting with the “Note” in paragraph 17, which should read as follows (new text underlined; deleted text strikethrough):  “The following precautions are to be considered before using the Chi-square test.  (1) Selection of the hypothesis to be tested should be based on previously known facts or principles  (2) Given the hypothesis, you should be able to assign expected values for each class correctly. Avoid using the chi-square test if the smallest expected class is less than five. By increasing the sample size the size of the smallest expected value can be made larger. Alternatively, if some classes have a size less than five, <u>either</u> pool neighboring classes to bring the size of the pooled class to five or more than five, <u>or use an exact test</u> .  (3) <del>The number of degrees freedom to look up on the chi-square table is not always obvious.</del> Degrees of freedom is defined as the number of classes that are independent to be assigned an arbitrary value. For example, if we have two classes the degrees of freedom is $2-1 = 1$ . Hence, in <del>testing any hypothesis using this method to test a hypothesis</del> , the degrees of freedom for the chi-square test is one less than the number of classes.”

	<p>(4) Avoid using two class situations which follow more like the binomial distribution <u>with np or nq less than 5</u> [“np” and “nq” to be explained]. If you encounter such situations, calculate expected values using formulae based on the binomial distribution. Always use Yates Correction (described in statistical text books), for determining the chi-square test with only one degree of freedom.</p> <p>It was agreed that more precise conditions should also be specified.</p>
18.	To correct the spelling of “Colletotrichum”. The TWC agreed that the document should refer to reference varieties (or most similar varieties) instead of “comparator”, to include an example from UPOV Test Guidelines and to refer to notes instead of classes.
21.	The TWC agreed to delete the comparison of the candidate variety against all comparators and leave the pair-wise comparison.
23.	The TWC agreed that the calculation of the expected values should be checked and changed to values that are conditional on row and column totals.
21.	to be deleted from explanation
	<u>Fisher’s Exact Test</u>
Example 1	<p>The TWC agreed that it should be explained that the method was used to check a hypothesis put forward by the breeder and agreed that it should be checked whether it was a one-sided or two-sided test .</p> <p>In reply to a question the expert from Australia explained that an acceptance probability of <math>p = 0.01</math> was used because that was a common value of “p” for DUS testing</p>
35.	To refer to “cross-pollinated species” instead of “self pollinated species”
Table 2	to replace “N” with “n”
	<u>Uniformity</u>
	Several experts wondered whether the example presented in this section was checking the sampling rather than the assessment of Uniformity. It agreed that the other Technical Working Parties should be invited to comment on that matter. In the meantime, it was noted that that section would not be relevant for the section on statistical methods for distinctness in TGP/8
New TGP/8 Part I section 6	“Methods for data processing for the assessment of distinctness and for producing variety descriptions” (see comments on agenda item “Handling measured, quantitative characteristics”)

30. The TWC agreed that Mr. Kristian Kristensen (Denmark) should produce a document on the use of generalized non-linear models, comparing the outcome with the data presented in document TWC/26/11 Rev., with the aim of considering whether that approach might be included as another option in TGP/8/1.

*TGP/11 Examination of Stability*

31. The TWC noted the developments concerning document TGP/11/1 Draft 5, as set out in documents TWC/26/3 and TWC/26/9.

*TGP/12 Special Characteristics*

32. The TWC discussed document TGP/12/1 Draft 5.

33. The TWC agreed with the proposal of the Technical Working Party for Agricultural Crops (TWA) to remove Section III: "Examination of characteristics using image analysis" from TGP/12 and to include that as a new section in document TGP/8, on the basis that it does not concern characteristics, but rather methods of examining characteristics.

34. With regard to Section III, Subsection 3, the TWC agreed as follows:

(a) for existing characteristics: to explain the need to compare the results of the characteristics examined by the old method and by image analysis. The TWC noted that it might, in some cases, lead to a modification of the existing characteristic, in which case it would be necessary for the Test Guidelines to provide a clear definition of the characteristic, including an outline of the algorithm which defined the characteristic;

(b) for new characteristics: to provide guidance on the need to meet the requirements for a characteristic to be used for DUS, as set out in the General Introduction, and the need to check for independence from other characteristics, in the same way as for other characteristics

35. In response to an observation from an expert from China, it was agreed that the guidance to be developed in TGP/8 on image analysis should provide guidance on how to consider calibration of images, particularly images containing more than one object, to account for the differing distances of the objects from the camera.

36. The TWC agreed that Mr. Gerie van der Heijden (Netherlands) should prepare a draft text for Section III, Subsection 3, taking into account the comments made above.

*TGP/13 Guidance for New Types and Species*

37. The TWC noted the developments concerning document TGP/13/1 Draft 12, as set out in documents TWC/26/3 and TWC/26/9.

*TGP/14 Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents*

38. The TWC considered documents TGP/14/1 Draft 6, TWV/41/10 Rev., TWC/26/10 and TWC/26/12 and agreed to propose the following amendments to document TGP/14/1 Draft 6: Section 3: Statistical Terms

	To develop and introductory section to explain that the definitions included in the glossary are in relation to the use of this terms in DUS examination.
Acceptance probability	to read “The minimum probability of accepting a variety with the population standard of off-types. (See document TGP/8: Part II, Section [4.1])”
Alpha ( $\alpha$ )	to read “[...] If the obtained statistic leads to rejection of the tested hypothesis, it is not because the obtained statistic could not have occurred by chance, but because the probability of obtaining the statistic by chance is sufficiently low (1 in 100), and so it is reasonable to conclude that the results are not due to chance.
Alpha-design	to read “[...] Such designs are particularly useful when there are many treatments to be examined, the variability of the experimental units is such that the block size needs to be kept small, and blocks can be combined into complete replicates.
Contingency Table	Australia to provide new example
Distribution	to read “Distribution (Probability Distribution): Form of a function that describes the possible outcomes of a variable. The distribution of a variable specifies the chance that the variable takes a value in any subset of the real numbers. Examples include [Binomial Distribution, Chi-squared distribution, Continuous Distribution, Discrete Distribution, F-Distribution, Frequency Distribution, Normal Distribution, Relative Frequency Distribution, Standard Normal Distribution, Symmetric Distribution, Student’s t-Distribution, t-Distribution, Z-Distribution etc.]  Note: To delete those distributions in the square brackets which are not certain to be included in TGP/8.
Fixed term/Fixed factor	definition to be provided by Sally Watson (United Kingdom) under mixed models
Mixed model	To read: “a model containing a combination of random and fixed effects as well as error effects” definition to be provided by Sally Watson (United Kingdom)
Mode	to be deleted
Paired t-Test	to be deleted
Population standard	to read “The maximum percentage of off-types that would be permitted if all individuals of the variety could be examined. (See document TGP/8: Part II, Section 4.1)”
Precision	definition to be provided by Sally Watson (United Kingdom)
Predicted Values	definition to be provided by Sally Watson (United Kingdom)
Prediction	definition to be provided by Sally Watson (United Kingdom)
Random Variable	to be deleted
Statistical Model	definition to be provided by Sally Watson (United Kingdom)

Stochastic Variable	to be deleted
Student's t-Distribution	definition to be provided by Sally Watson (United Kingdom)
Symmetric Distribution	definition to be provided by Sally Watson (United Kingdom)
t-Distribution	definition to be provided by Sally Watson (United Kingdom)
(new) Categorical variables	to read "see Variables"
(new) Fisher's Exact Test	to read "a statistical test used for assessing significance in categorical data (see document TGP/8: Part II, Section [3.7])"
(new) Random effect	definition to be provided by Sally Watson (United Kingdom) under mixed models
Parametric statistics / Non-parametric statistics	no definition to be provided unless those terms used in document TGP/8.

39. The TWC invited further comments on document TGP/14/1 Draft 6: Section 3: Statistical Terms, to be sent to the Office by October 31, 2008. A new draft of that section, based on the changes agreed at the meeting and comments received by October 31, 2008, would be circulated for comment by the end of November 2008, with an invitation for comments to be received by December 31, 2008.

*(b) Revision of TGP documents:*

*TGP/7 Development of Test Guidelines*

40. The TWC noted the proposals for revisions to document TGP/7/1, as set out in documents TWC/26/3 and TWC/26/9.

*Program for the development of TGP documents*

41. The TWC noted that the program set out in the Annex to document TWC/26/3 was incomplete. It agreed that it should consider drafts of documents TGP/7/2 "Development of Test Guidelines", TGP/8/1 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability" and TGP/14/1 "Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents" at its twenty-seventh session.

Project to consider the publication of variety descriptions

42. The TWC noted the information provided in document TWC/26/6.

Database combining variety data for maize from different UPOV members

43. The TWC considered document TWC/26/16, presented by Mr. Sylvain Grégoire (France). It was explained that the purpose of the project was to develop a database for use by the project partners in the management of reference collections and that it was not intended to publish descriptions from the database.

Management of reference collections in oilseed rape using morphological and molecular data from different sources

44. The TWC considered document TWC/26/18, presented by Mr. Sylvain Grégoire (France). He explained that the document had been prepared primarily for consideration at the eleventh session of the Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT), to be held in Madrid, from September 16 to 18, 2008.

45. The TWC considered document TWC/26/20 and a presentation made by Mr. Uwe Meyer (Germany), a copy of which is provided in document TWC/26/20 Add.. It was noted that the type of characteristic should be checked in Tables 1 and 2. For example, UPOV numbers 13 and 14 should be changed from QL to QN.

Handling measured, quantitative characteristics

46. The TWC considered documents TWC/26/15 and TWC/26/23, presented by Mr. Vincent Gensollen (France) and Mr. Uwe Meyer (Germany), respectively, and an oral presentation by Ms. Mariko Ishino (Japan). The presentations made by Ms. Ishino and Mr. Gensollen are reproduced in documents TWC/26/24 and TWC/26/15 Add., respectively.

47. With regard to document TWC/26/15, it was agreed that Figure 1 and the associated explanation should include the “even” notes (i.e. 2, 4, 6, 8). It was also agreed that Example 2 “Use of simple statistics” in document TWC/26/15 Add., should be included as an explanation of the handling of measured quantitative characteristics.

48. In the presentation of document TWC/26/23, Mr. Meyer explained that notes were used as the basis for distinctness for measured quantitative characteristics in self-pollinated varieties, because the use of statistical methods such as COYD might “over-determine” differences between varieties. The TWC noted the following explanation in document TGP/9/1 concerning the “two-note rule”:

“5.2.3.2.3.2 Thus, it is the intention that the states and Notes in the UPOV Test Guidelines are useful for the assessment of distinctness. It is recalled that this section considers the assessment of distinctness based on the information obtained from the growing trial and, therefore, refers to a situation where the states of expression and Notes are obtained for all varieties from the same growing trial in the same year. That situation is, in particular, reflected when the General Introduction states that:

““5.4.3 For quantitative characteristics, a difference of two Notes often represents a clear difference, but that is not an absolute standard for assessment of distinctness. Depending on factors, such as the testing place, the year, environmental variation or range of expression in the variety



collection, a clear difference may be more or less than two Notes. Guidance is provided in document TGP/9, 'Examining Distinctness'."

"5.2.3.2.3.3 A difference of two Notes is appropriate if the comparison between two varieties is performed at the level of Notes (VG, mean of VS). If the difference is only one Note, both varieties could be very close to the same border line (e.g. high end of Note 6 and low end of Note 7) and the difference might not be clear. When the comparison is performed at the level of measured values (MG, mean of MS) (see Section 5.2.3.3) a difference smaller than two Notes might represent a clear difference.

"5.2.3.2.3.4 Document TGP/7/1, Annex 3: GN 20, explains that, in the case of quantitative characteristics, it is necessary to determine the appropriate range to describe the characteristic. In general, a standard "1-9" scale is used, but a "limited" range (Notes 1-5) and a "condensed" range (Notes 1-3) have also been accepted. Thus, when deciding on the number of Notes required to establish distinctness, the range of the scale needs to be taken into account.

"5.2.3.2.3.5 In deciding, whether the "two-Note" standard is an appropriate basis for distinctness, it is also necessary to take into account the environmental variation within the growing trial."

49. In response to a question from an expert from the United Kingdom, it was noted that the "width" of the states could vary from year to year, e.g. in the case of the barley example, the notes might be somewhat wider or narrower than 6 cm in different years. The expert from Denmark observed that consistency from year to year could be achieved by a regression method. The expert from Kenya sought clarification on whether scale would be changed as a result of shorter or taller varieties being included in the variety collection. The expert from Poland then wondered if the variety description would need to be changed if the scale was changed. An expert from France explained that the official variety description, issued at the time of grant of the plant breeder's right, would never change; however, the description of varieties included in the database would change if the scale was changed. He referred to document TWC/26/16 as an illustration of how descriptions might need to be modified for harmonization.

50. In her presentation, Ms. Ishino recalled that an explanation on adjustment by the proportional method had been included in document TWC/25/3 Add., which had been presented at the twenty-fifth session of the TWC and explained that the adjustable range depends on the dispersion of the data of the example varieties, therefore there is a difference between self-pollinated plants and cross-pollinated plants. She clarified that the sliding method was used for characteristics with no fixed distance, e.g. ratios.

51. The TWC agreed that the information provided in the documents and presentations by the experts from France, Germany and Japan provided valuable guidance on data processing for the assessment of distinctness and for producing variety descriptions and noted that UPOV did not have guidance on that matter in the TGP documents. It agreed that a new section should be created in document TGP/8/1, Part I as "Data processing for the assessment of distinctness and for producing variety descriptions" and that the methods used by France, Germany and Japan should be included in a new section in document TGP/8/1, Part II as "Methods for data processing for the assessment of distinctness and for producing variety descriptions". In response to invitations to other members of the Union to contribute information, Finland, Kenya and the United Kingdom offered to provide information on the methods used in their countries. The TWC agreed that Finland, France, Germany, Japan,

Kenya and the United Kingdom should prepare information on their methods for inclusion in the next draft of document TGP/8, and would submit those drafts to the Office by October 31, 2008.

### Exchangeable software

52. The TWC considered document TWC/26/7.

53. The TWC clarified that it would not be possible for the TWC to perform a detailed assessment of the programming of the software and confirmed that, in accordance with document TWC/26/7, paragraph 5, the TWC would only be able to propose the inclusion of software in the proposed exchangeable software document on the basis of the experiences presented by experts from the members of the Union at the TWC session.

54. In response to a suggestion that the Annex to document TWC/26/7 should contain information on the versions of the software, the TWC concluded that the document should be kept as simple as possible and noted that that information could be obtained via the software source. Users of the software would be able to provide information on the version used in the column “Application by user(s)”, if appropriate.

55. The TWC agreed that the software should not need to have been developed by a member of the Union, but would need to have been used by a member of the Union for inclusion in the document. In particular, jointly-developed software, freely available software packages and packages built around commercial software products could be included, provided that all intellectual property rights were respected and suitable information provided in the column for “Condition for Supply”.

56. With regard to the Annex to document TWC/26/7, the TWC agreed that item (c) (also in document TWC/26/7, paragraph 6(c)) should read “DUS trial design and data analysis”. It also agreed that a new title should be added for “Variety denomination”, which could, for example, include software for checking the similarity of variety denominations. The TWC agreed that the Technical Committee should already be invited to include the DUSTNT and GAIA software in a first edition of the document. The experts from the United Kingdom and France agreed to provide the necessary information to the Office by November 30, 2008.

### Image analysis

57. The TWC considered document TWC/26/21 Rev., presented by Mr. Adrian Roberts (United Kingdom), and a presentation by Mr. Nik Hulse (Australia), a copy of which is reproduced as document TWC/26/25.

58. With regard to document TWC/26/21 Rev., an expert from France requested clarification of the nature of the cost benefits. Mr. Roberts explained that he could not provide precise details of the cost benefits, but confirmed that those were linked to the time-saving in making the necessary observations and recalled that the observations were of a higher consistency than by manual measurements. An expert from the Czech Republic commented that the orientation of objects could be a problem when using image analysis. Mr. Roberts confirmed that it can be beneficial to have a defined layout for the samples.

59. With regard to the use of image analysis to develop new characteristics, the Office recalled that document TGP/12/1 Draft 5 “Special Characteristics”, Section III. Examination of characteristics using image analysis” explained that: “Characteristics which may be examined by image analysis should also be able to be examined by visual observation and/or manual measurement, as appropriate. [...] the General Introduction clarifies that the use of image analysis is one possible method for examining characteristics which fulfill the basic requirements for use in DUS testing (see document TG/1/3, Chapter 4.2), which includes the need for the uniformity and stability of such characteristics to be examined.”. In response to a question by the Office on how off-types would be recognized using image analysis, Mr. Roberts explained that uniformity in Pea in the United Kingdom was assessed by both off-types and COYU, with COYU being applied to the same quantitative characteristics to which COYD was applied.

60. An expert from China wondered if the use of image analysis would save time and cost, because considerable time was involved in preparing the images. Mr. Hulse explained that, in Australia, the photographs of the plants were already being collected and the use of the photographs for image analysis did not imply significant extra work in that respect, whilst allowing more control in the quality of recording. Mr. Roberts confirmed that it would be necessary to do a cost/benefit analysis to ensure that image analysis would represent a net benefit. An expert from Netherlands explained that image analysis also had the benefit of enabling new characteristics to be developed and also allowed “average” images of the variety to be produced. In response to a question from the Chairperson, Mr. Hulse explained that the software used in Australia was freely available and had not required any tailoring for their purposes.

#### On-line application systems

61. The TWC considered document TWC/26/22, presented by Mr. Uwe Meyer (Germany), and received presentations by Mr. Man Jae Kwon (Republic of Korea) and Mr. Nik Hulse (Australia), which are reproduced as documents TWC/26/27 and TWC/26/26, respectively.

62. In response to a request from an expert from China, Mr. Meyer explained that the Adobe software for the Bundessortenamt system had cost approximately €50,000, which covered the development of a maximum of 10 forms: the plant breeder’s right version and the national list version meant that it had developed two forms. In addition to the software cost, Adobe had provided 15 days of training, which had cost €15,000. The development of the system within the Bundessortenamt had involved one person over one year. He further explained that an electronic card reader could cost up to €120 and a card cost approximately €100. In response to a question from an expert from Republic of Korea, Mr. Meyer explained that it was not appropriate to develop a system for payment in parallel to the application, because the payment had to be made to a separate department within the government. With regard to the “trust center”, he clarified that that was independent to the Bundessortenamt and further explained that the level of electronic signature required for an application was at the highest level of security.

63. In response to a question from the Office, Mr. Meyer confirmed that the Bundessortenamt application form could receive data in XML format from other sources, e.g. data from common fields in a standardized application form.

64. With regard to the system presented for the Republic of Korea, an expert from China questioned why the variety denomination had to be provided in English as well as in Korean. It was explained that the denomination had to be provided in English and Korean. The denomination transliterated into English was checked against, for example, the UPOV-ROM. The Korean Seed and Variety Service (KSVS) also checked the English transliteration.

65. In concluding his presentation, Mr. Hulse explained that their online application system transferred data into a database, which had produced a comprehensive database containing data from 4 years and different locations, which would be a good basis for analyzing the consistency and discriminatory power of characteristics. However, for the time-being there was no project in place to allow such analysis of the data. With regard to additional characteristics, which were not included in the UPOV Test Guidelines, those had resulted from breeding developments, e.g. intergeneric hybrids.

### Development of COY

#### *(a) COY: selecting the optimum number of plants*

66. The TWC considered document TWC/26/17 and a presentation by Mr. Kristian Kristensen (Denmark), a copy of which is reproduced as document TWC/26/17 Add..

67. The TWC noted the following possible actions to address the bias in the present method of calculation of COYU, as identified and commented on by Mr. Kristensen, :

1. Ignore the biases  
(comment: the test will most probably be too liberal)
2. Correct only for the bias introduced by the smaller sample sizes  
(comment: the tests will be too liberal, but will be comparable to those in the past)
3. Correct only for the present bias  
(comment: the test will be conservative, but not comparable to the past)
4. Correct for all biases  
(comment: there will be no biases, but the tests will not be comparable to the past)

68. An expert from the United Kingdom asked whether the drafters of the document had considered the possibility of using linear regression as an alternative to the methods considered in the paper. The expert from the Netherlands speculated that the smoothing spline could be a valid alternative to the moving average proposed in COYU. The expert from Poland wondered whether the possible correlation on the trend values would influence the results. The expert from Denmark explained that the value of the expected residual mean square depended only on the variances and thus was independent of the correlation between the trends. An expert from France considered that the conclusions on the influence of the reduction in the number of plants in COYU presented in the document were very relevant, given that the reduction in the number of plants was under consideration by many UPOV members in order to reduce costs in DUS examination. He wondered whether some adaptation in the program should be made. An expert from the United Kingdom considered that it would be useful to perform some simulations to see the effect of the reduction in the number of plants as well as to explore possible routines to be incorporated into COYU, such as the one proposed by the expert from the Netherlands. He offered to cooperate in that task. The expert from Denmark explained that he had made a simulation which had confirmed the bias of the present method of calculation of COYU. He added that it would be possible to

incorporate another trend correction method in the simulation program, but he did not have experience in the use of the smoothing spline method.

69. The TWC agreed that Denmark and the United Kingdom should prepare a new document, including a simulation using the smoothing spline method. It was noted that that would also allow experts further time to reflect on the situation and possible ways forward.

*(b) Comparison of COYU and a method based on Bennett's test for coefficients of variation*

70. Mr. Wieslaw Pilarczyk (Poland) recalled that, at the twenty-fifth session of the TWC, the Chairperson had noted that the method based on the Bennett's test used the coefficient of variation (which is the standard deviation divided by the mean) and wondered what would happen if there was a negative correlation between characteristics and the standard deviation, which she had sometimes seen in the United Kingdom data. Mr. Pilarczyk had explained that he had not encountered such data and had requested the Chairperson to provide such data for checking in the method based on the Bennett's test.

71. Mr. Pilarczyk reported that it had not been possible to use the United Kingdom data because it had transpired that the data was interval scale data, rather than ratio scale data and it was, therefore, not meaningful to compute a coefficient of variation.

*(c) An adjustment to the COYD method when varieties are grouped within the DUS trial*

72. The TWC considered document TWC/26/14 and a presentation made by Mr. Adrian Roberts (United Kingdom), a copy of which is included in document TWC/26/14 Add..

73. The expert from Poland highlighted that the proposed adjusted COYD was beneficial when the variety-by-group interaction was larger than the variety-by-year interaction, which might not be the case for all characteristics and asked whether the intention was to apply the revised method on a characteristic-by-characteristic basis. The expert from the United Kingdom clarified that the method could be applied in that way, or could be applied to all characteristics. Experts from Denmark, Kenya and the Netherlands considered that it would be useful to include to decide whether to use the adjusted COYD method depending on significance of the group-by-year interaction.

74. An expert from France recalled that, in general for self-pollinated crops, when grouping for DUS examination resulted in small groups there was no problem for the assessment of distinctness. He considered that it would be interesting to test the adjusted COYD in a cross-pollinated crop, and offered to prepare a document on that subject. The TWC agreed that France should prepare such a document.

75. The expert from Denmark asked whether there would be an option to select between a comparison by a common multiple joint regression analysis (MJRA) or by one per group. The expert from the United Kingdom considered that it would be better to compare both before integrating them in a single method.

76. In reply to several question Mr. Roberts explained that a new module could, if considered appropriate, be incorporated into the revised DUSTNT to be completed by February 2009. The expert from the Netherlands considered that it might be too early to recommend that adjustment.

77. The Technical Director recalled that the DUSTNT program included many modules, however, UPOV had specifically endorsed the COYD and COYU methods, and suggested that that should be clarified in the document of exchangeable software and in the DUSTNT program. The TWC agreed that Mrs. Sally Watson (United Kingdom) should prepare a presentation on the modules contained in the program DUSTNT, highlighting those which are involved in COY analysis, for consideration by the TWC at its twenty-seventh session.

78. The TWC agreed to invite experts to propose other DUSTNT modules, which had been used by them, for endorsement in the document on exchangeable software.

#### UPOV information databases

79. The TWC noted the information provided in document TWC/26/4.

#### Variety denominations

80. The TWC noted the information provided in document TWC/26/5

#### Assessing uniformity by off-types on the basis of more than one sample or sub-samples

81. The TWC considered document TWC/26/8.

82. The TWC agreed that a questionnaire could be issued on the basis of the Annex to document TWC/26/8, with the amendments that the first line of page 2 should read “barley” instead of “wheat” and that the header for “II” should read “II – Example of 2-step test for the assessment of uniformity of characteristics observed on a sample size of 100 plants or parts of plants”. However, the TWC noted that the example provided in the Annex to document TWC/26/8 indicated that it would be useful for the TWC to discuss the use of such an approach.

#### Database to research TWC working documents

83. The TWC considered document TWC/26/13, introduced by Mr. Thomas Drobek (Germany), and received a presentation on the latest edition of the “Database to research TWC working documents”.

84. The TWC noted with appreciation that, in accordance with the request of the Technical Committee, a warning on the status of the documents and the purpose of the database was automatically presented at each opening of the database.

85. The TWC welcomed the latest edition of the CD-ROM containing the database to search for TWC working documents, which was distributed to participants at the session.

Future Program, Date and Place of the Next Session

86. At the invitation of the United States of America, the TWC agreed to hold its twenty-seventh session in Alexandria, Virginia, United States of America, on June 15-19, 2009. During the twenty-seventh session, the TWC planned to discuss or re-discuss the following items:

1. Opening of the session
2. Adoption of the agenda
3. Short reports on developments in plant variety protection:
  - (a) Reports from members and observers (oral reports by the participants)
  - (b) Reports on developments within UPOV (oral report by the Office of the Union)
4. Molecular techniques (document to be prepared by the Office of the Union)
5. UPOV Information Databases (document to be prepared by the Office of the Union)
6. TGP documents
7. Assessing uniformity by off-types on the basis of more than one sample or sub-samples (document to be prepared by the Office of the Union)
8. Development of COY
  - (a) COYU: possible proposals for improvements to COYU (document to be prepared by Denmark, Germany and United Kingdom)
  - (b) A comparison of COYU and a method based on Bennett's Test for coefficients of variation (document to be prepared by Poland)
  - (c) A rationale for elimination of reference varieties when COYD is used (document to be prepared by United Kingdom)
  - (d) Adjustment to COYD for grouping characteristics (document to be prepared by United Kingdom and France)
9. Statistical methods for visually observed characteristics (document to be prepared by Denmark)
10. Image Analysis (documents invited)
11. On-line application system (Japan, documents invited and document to be prepared by the Office of the Union)
12. Exchangeable software (presentations of software invited and document to be prepared by the Office of the Union)
13. DUSTNT programs (document to be prepared by United Kingdom)
14. Database for researching TWC documents (CD to be prepared by Germany)
15. Data loggers (presentations invited and document to be prepared by the Office of the Union)
16. Date and place of the next session
17. Future program

Medal

87. Mrs. Sally Watson was awarded a UPOV bronze medal in recognition of her chairmanship of the TWC from 2006 to 2008.

88. *The TWC adopted this report at the close of the session.*

[Annexes follow]



ANNEX I

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Man Jae KWON, Computer Section, Korea Seed and Variety Service (KSVS), Korean Seed and Variety Service (KSVS), Ministry of Food, Agriculture, Forestry and Fisheries (MIFAFF), 433, Anyang 6-Dong, Manan-gu, Anyang-Shi, Gyeonggi-Do 430-016 (tel.: +82 31 467 0244 fax: +82 31 449 1506 e-mail: [jaekm@seed.go.kr](mailto:jaekm@seed.go.kr))

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UNITED KINGDOM

Adrian M.I. ROBERTS, Biomathematics & Statistics Scotland (BioSS), James Clerk Maxwell Building, The King's Buildings, Edinburgh EH9 3JZ (tel.: +44 131 650 4893 fax: +44 131 650 4901 e-mail: [adrian@bioss.ac.uk](mailto:adrian@bioss.ac.uk))

Sally WATSON (Mrs.), Biometrics Branch, Agri-Food & Biosciences Institute, 18a, Newforge Lane, Belfast BT9 5PX (tel.: +44 28902 55 292 fax: +44 28902 55 008 e-mail: [sally.watson@afbini.gov.uk](mailto:sally.watson@afbini.gov.uk))

## II. OFFICER

Sally WATSON (Mrs.), Chairperson

## III. ORGANIZATIONS

### INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

Peter BUTTON, Technical Director, 34, chemin des Colombettes, CH-1211 Geneva 20, Switzerland (tel. +41-22-338 8672, fax +41-22-733 03 36 (e-mail: [peter.button@upov.int](mailto:peter.button@upov.int)))

Raimundo LAVIGNOLLE, Senior Counsellor, 34, chemin des Colombettes, 1211 Geneva, Switzerland (tel.: +41 22 338 9565 fax: +41 22 733 0336 e-mail: [raimundo.lavignolle@upov.int](mailto:raimundo.lavignolle@upov.int))

[Annex II follows]

TWC/26/29

ANNEX II

Welcome Address made by

Mr. Ilho Cho,  
Director,  
Plant Variety Protection Division,  
Korea Seed and Variety Service (KSVS)

Good morning,

Dr. Sally Watson, Chairman, ladies and gentlemen! Welcome to Jeju, beautiful island of Korea for this 26<sup>th</sup> TWC meeting!

My name is Ilho Cho, Director of Plant Variety Protection Division of Korea Seed and Variety Service. It is my great pleasure to welcome you on behalf of Director-General Bae of our organization. He will join today's dinner reception and greet all of you.

This morning, over 40 participants from 15 member countries are attending at this opening ceremony for the 26<sup>th</sup> meeting on Automation and Computer Programs. Thank you very much for your participation! and, I would like to extend my sincere gratitude to Dr. Sally Watson, Madam Chair, and Dr. Peter Button and Dr. Raimundo Lavignolle, UPOV Secretariat for the wonderful organization of this important technical working party meeting.

I know before this meeting already two different workshops were held. One was the 2 days' workshop on Trial Design and Data Handling during last weekend, and the other the Preparatory Workshop on UPOV System yesterday. I have reported they were very helpful and successful. At this occasion, I would like to greatly appreciate all speakers for your valuable presentations and to active participants as well.

Dear Chairperson and delegates! Korea implemented PVP system in 1997 after legislation of Seed Industry Act in 1995, and joined UPOV as the 50<sup>th</sup> member country in 2001. Currently, 223 plant genera and species are entitled to plant variety protection in Korea. And the Plant Breeder's Rights have been given to over 2,300 varieties.

Our government has been also strengthening international cooperation in the area of PVP within the UPOV structure. Further, we launched an international training program on PVP issue to support countries newly introducing the system.

The close cooperation among UPOV members is important in harmonizing their PVP activities under the umbrella of UPOV and contributing the development of this area.

I believe this meeting would be very productive and fruitful with your active participation and deep discussion.

Lastly, during your staying, I hope you could enjoy the unique culture and beautiful scenery of this wonderful island, Jeju.

Thank you!

[Annex III follows]



TWC/26/29

ANNEX III

Presentation made by




Chan-Woong Park,  
DUS Examiner,  
Korean Seed and Variety Service (KSVS)




## Contents

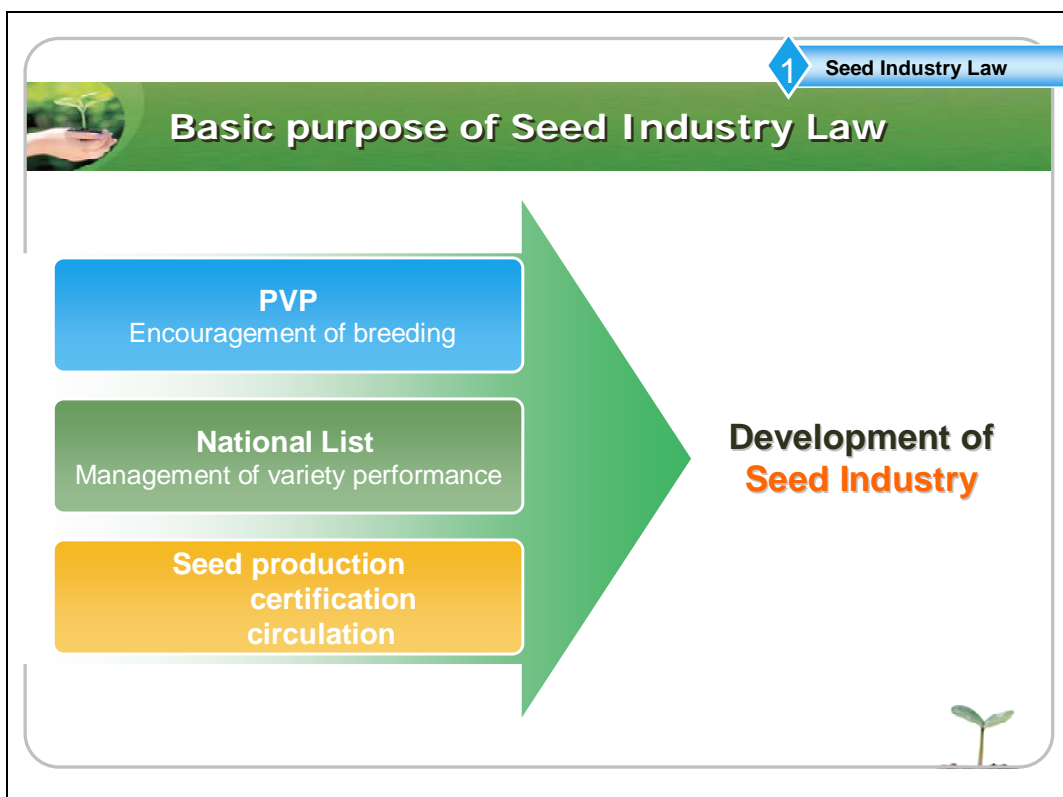
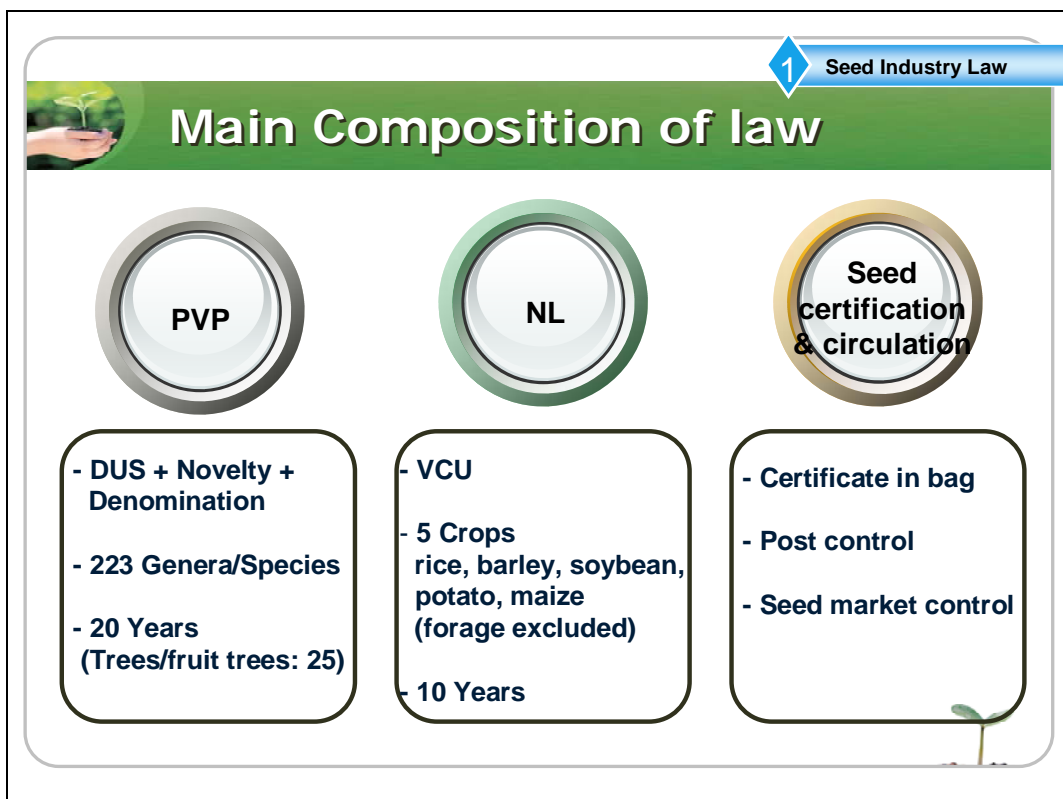
1	Seed Industry Law
2	Plant Variety Protection
3	Examination system in KSVS
4	Statistics
5	Others

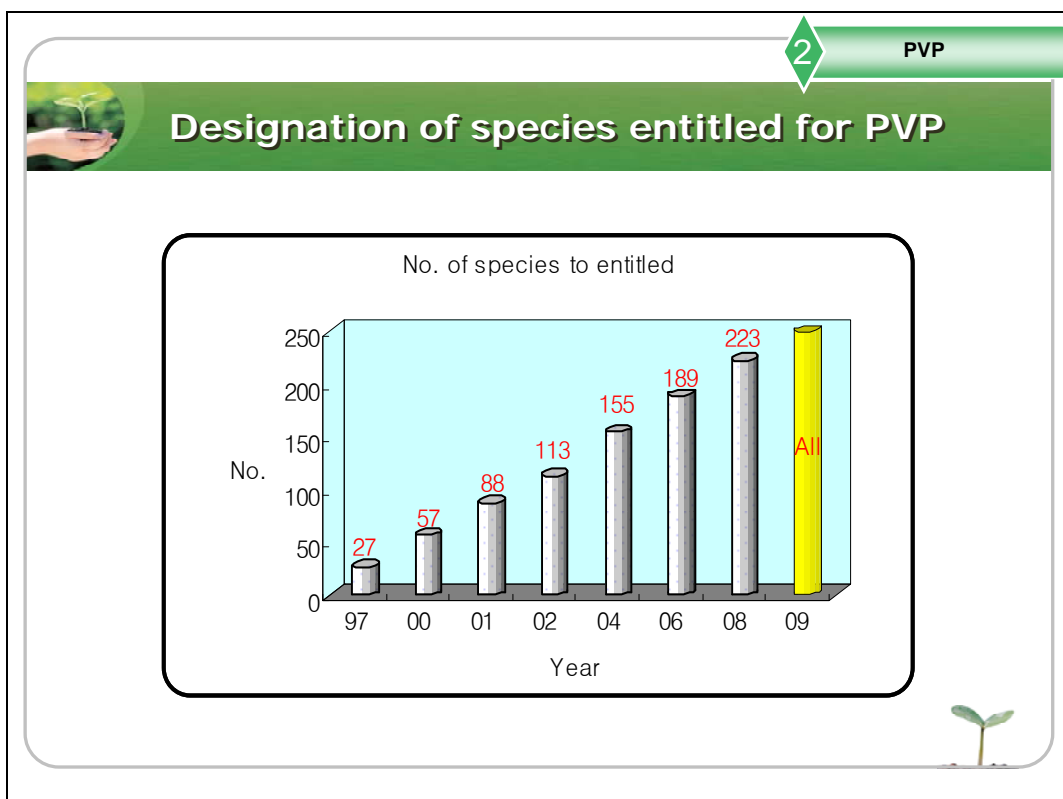
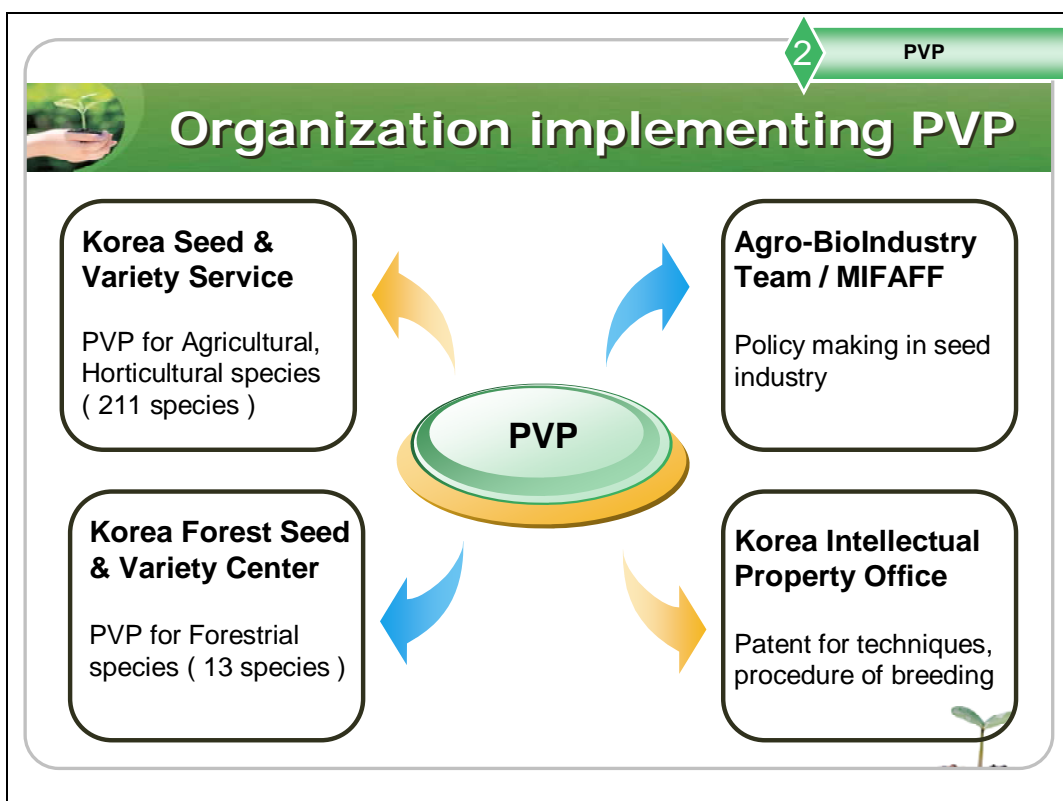
## History of the Seed Industry Law

<b>1995. 2.</b>	<b>Drafting Seed Industry Law</b>
<b>1995.12.</b>	<b>Established and published for public</b>
<b>1997.12.</b>	<b>Implemented on December 31, 1997</b>
<b>Revision</b>	<ul style="list-style-type: none"> <li>- in 1999 (Law No. 5668)</li> <li>- 2000 ( No. 6190)</li> <li>- 2001 ( No. 6374)</li> <li>- 2003 ( No. 6999)</li> <li>- 2005 ( No. 7678)</li> <li>- 2007 ( No. 8597)</li> </ul>





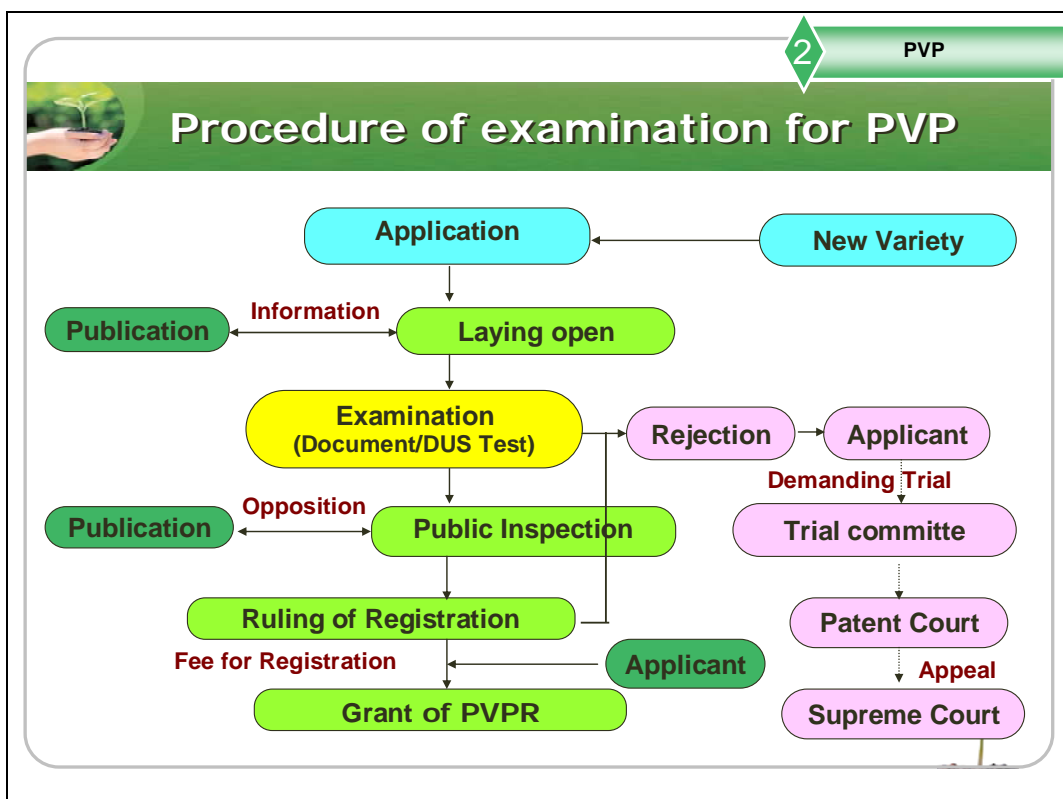




2 PVP

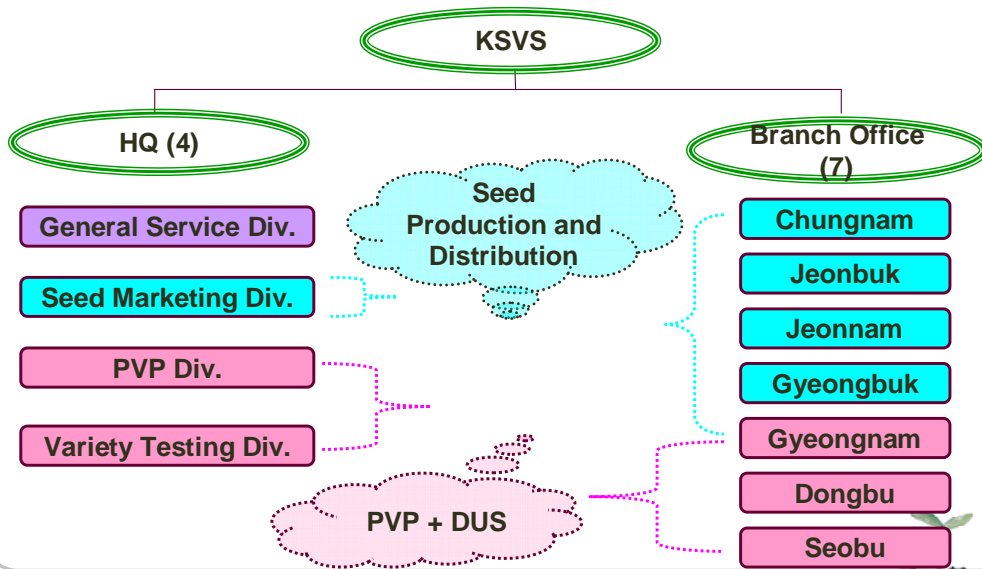
### Development of Test Guidelines for DUS test

	'97	'00	'01	'02	'04	'05	'06	'07	'08	Total
<b>Natl. TG</b>	27	30	26	16	-	28	11	9	1	148
<b>Not developed</b>	-	-	5	7	-	11	20	-	32	75
<b>Entitled plants</b>	27	30	31	25	42		34		34	223



3 Exam. system in KSVS

## Organization of KSVS



3 Exam. system in KSVS

## Location of KSVS



**3** Exam. system in KSVS

## Examination system in KSVS

<b>Divison</b>	<b>PVP Division</b>	<b>- Variety Testing Division - 3 Branch Offices</b>
<b>Function</b>	<b>Novelty, Denomination Examination</b>	<b>DUS Examination</b>
<b>Personell</b>	<b>Examiner</b>	<b>Examiner DUS examiner</b>

**3** Exam. system in KSVS

## Changes of examination system in 2008


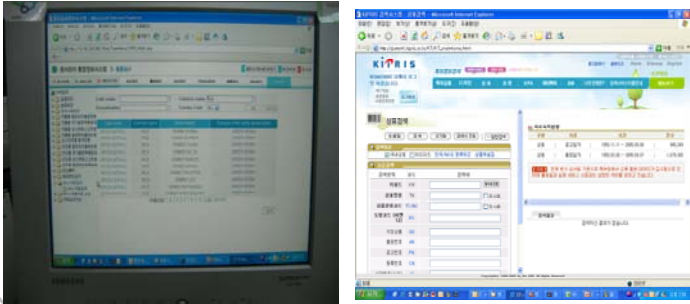
<b>Divison</b>	<b>PVP Division</b>		<b>o Variety Testing Division o 3 Branch Offices</b>	
<b>Function</b>	Before 2008	2008 ~	Before 2008	2008 ~
	Novelty, Denomination, DUS Examination	Novelty, Denominaion, <del>DUS</del> , Examination	DUS trial	DUS trial, <u>DUS examination</u>
<b>Personell</b>	Examiner	Examiner	DUS examiner	o DUS examiner o <u>Examiner</u>
<b>Characteristic</b>	(Before 2008) <b>Separation</b> of DUS test with examination		(2008 ~) <b>Integration</b> of DUS examination with DUS test	

**3 Exam. system in KSVS**

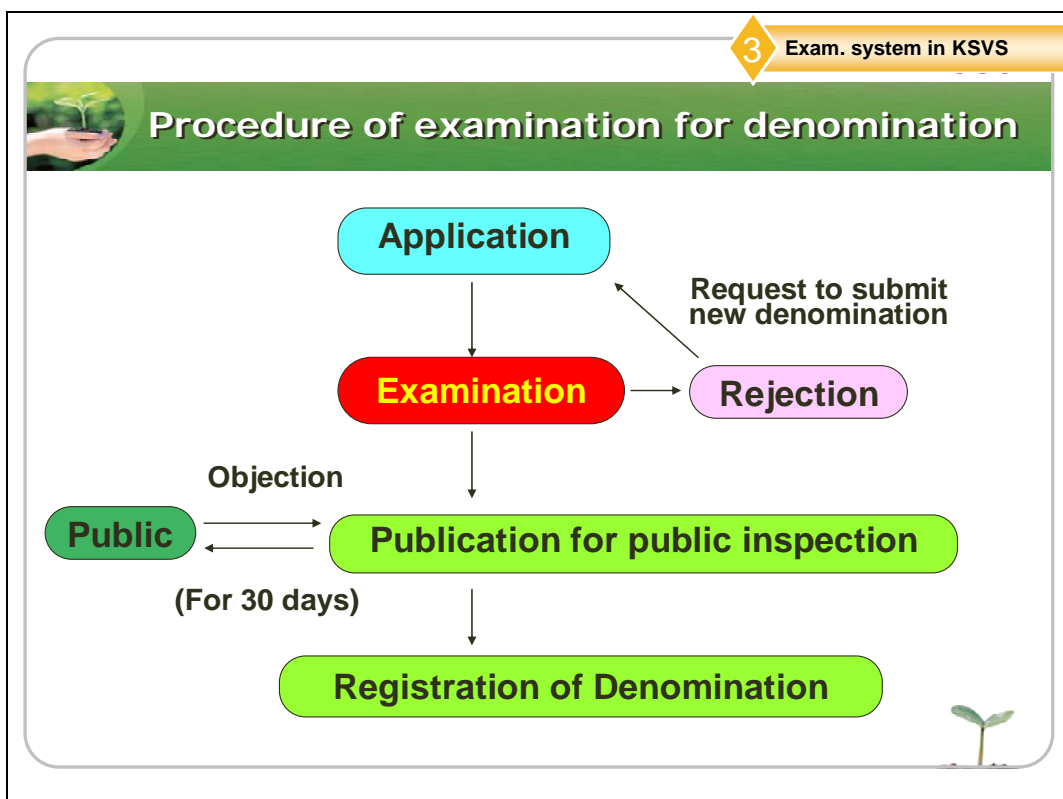
## Examination of variety denomination

- Related article in Seed Industry Law  
Article 109 “Requirment of variety denomination”
- 1 Denomination in 1 genera and species
- Trademark is not available as variety denomination

**Computer program**                      **Trademark check**



**UPOV-ROM check**



**3** Exam. system in KSVS

## DUS examination - personnell

Divison		Personnell	
		Examiner	DUS Examiner
<b>Total</b>		<b>4</b>	<b>18</b>
HQ	Variety Testing Div.	1	3
Branch Offices	Dongbu	1	3
	Seobu	1	7
	Gyeongnam	1	5

**3** Exam. system in KSVS

## DUS examination

DUS trial

- **in KSVS**
- **in breeder's field**
- in other institution (commission)

Documents

## 3 Exam. system in KSVS



## Fees for PVP

Application	\$ 38
Examination by documents	\$ 50
Examination by DUS trial	\$ 500 / Growing cycle

Annual Fee : 50% increase every 5 years

Years	Group 1	Group 2	Group3
	Rice, Radish,...	Maize, Tomato,...	Barley, Soybean,...
1 ~ 5	\$ 100	\$ 50	\$ 30
6 ~ 10	\$ 150	\$ 75	\$ 45
11 ~ 15	\$ 225	\$ 112	\$ 67
16 ~ 20	\$ 337	\$ 168	\$ 101
21 ~ 25	\$ 506	\$ 253	\$ 151

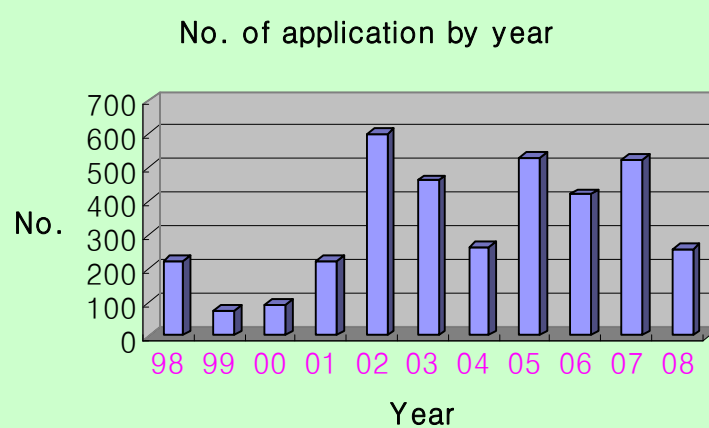
## 4

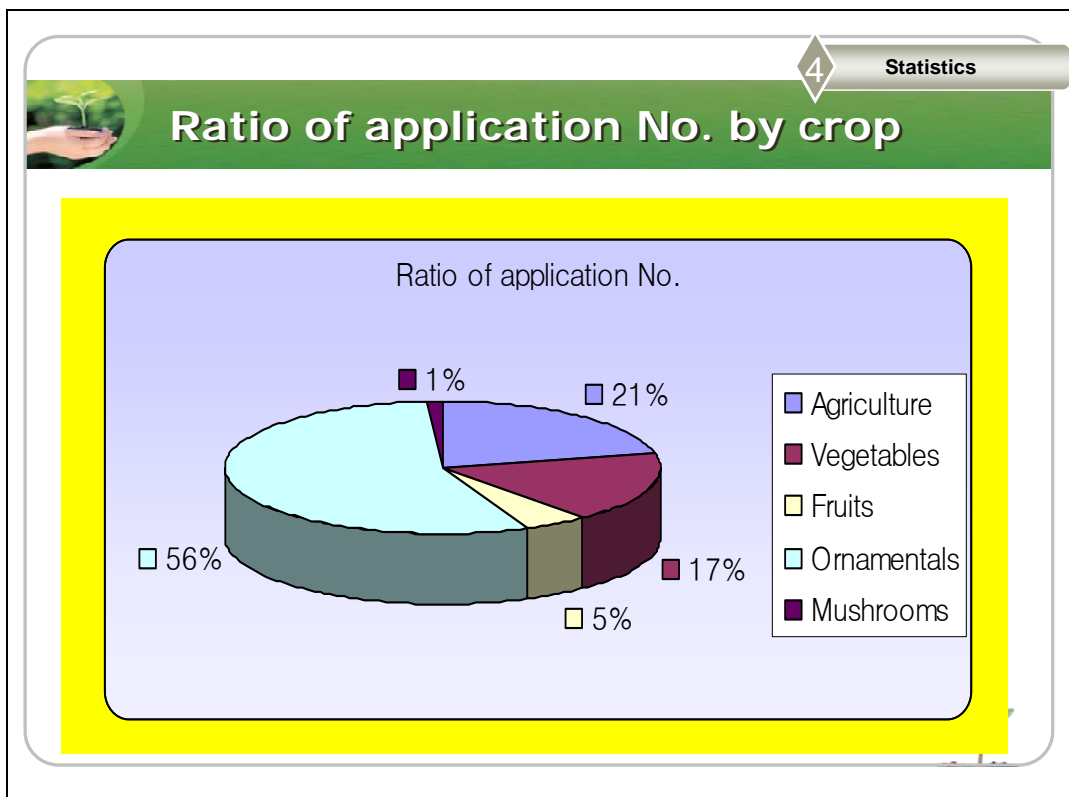
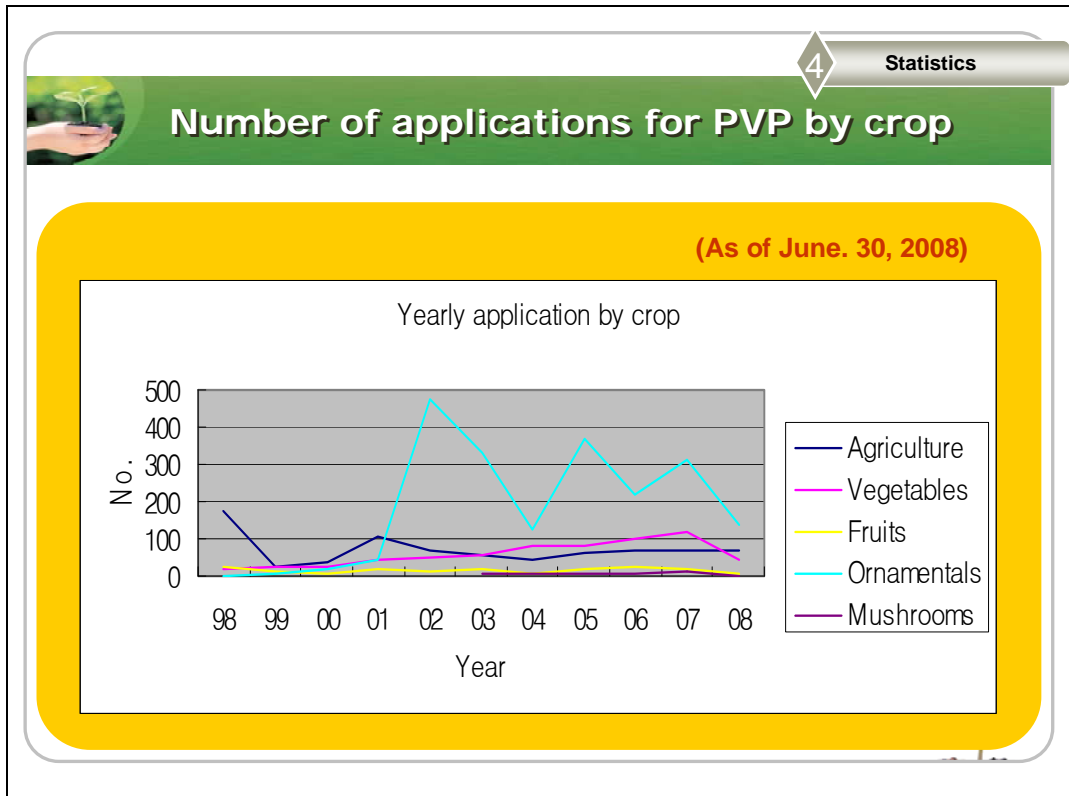
## Statistics



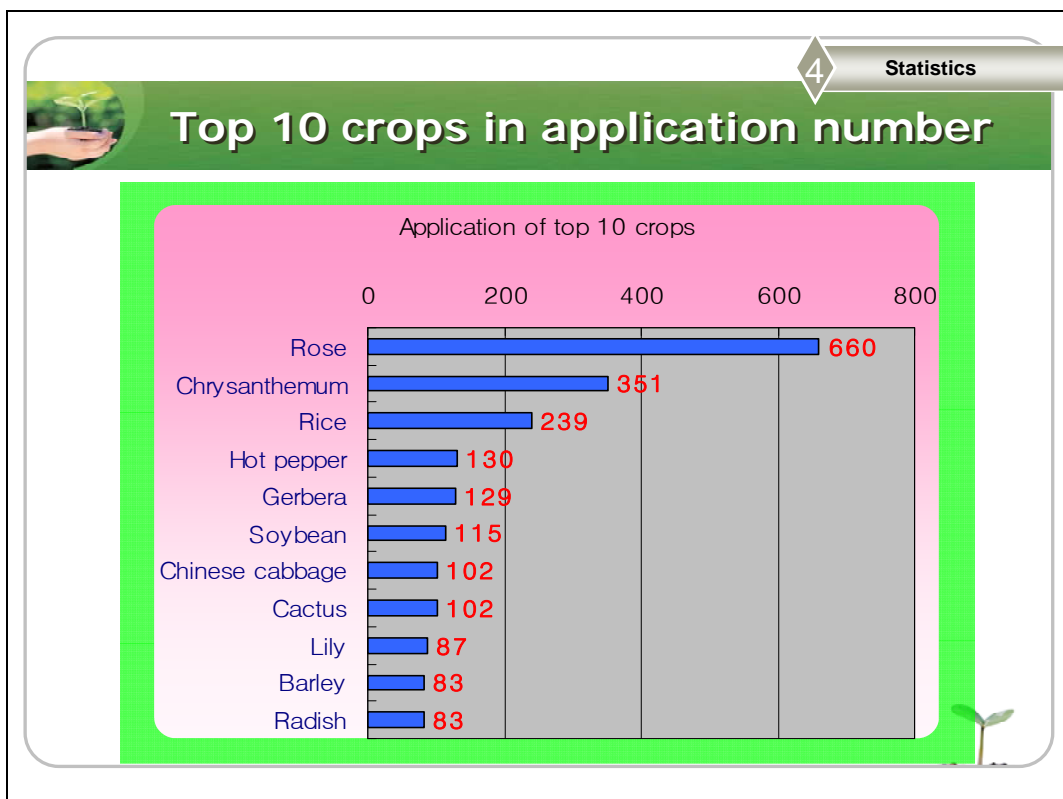
## Number of applications for PVP by year

(As of June. 30, 2008)









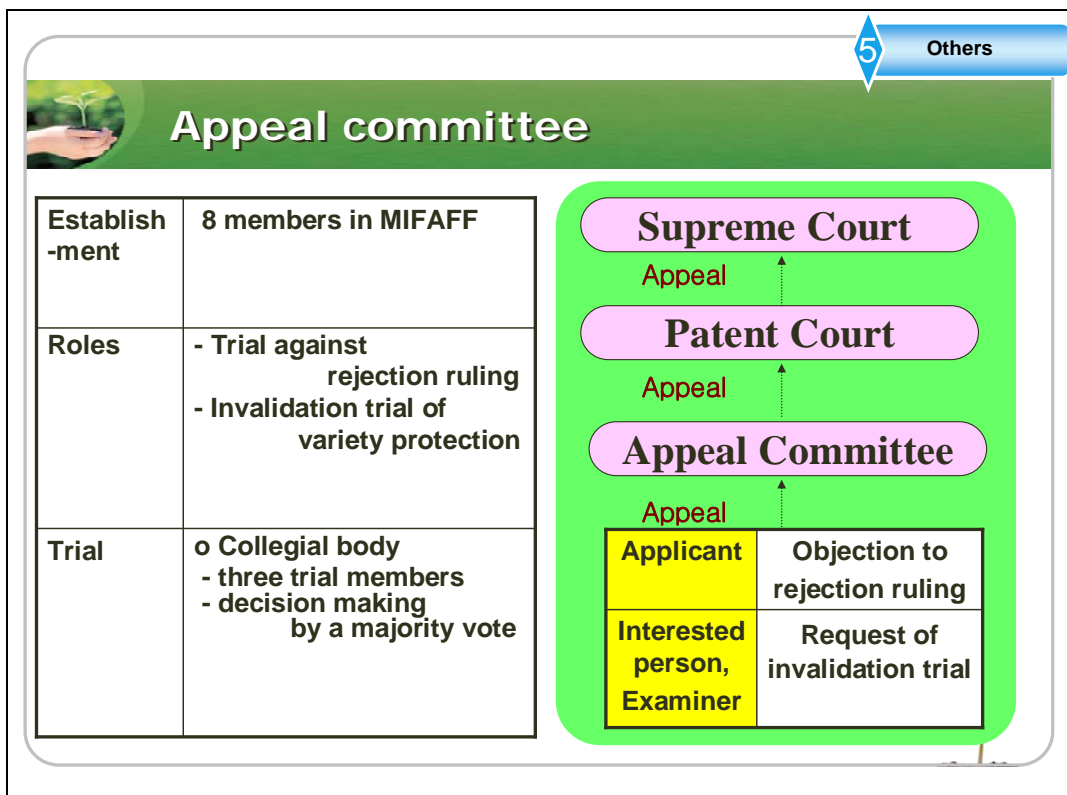
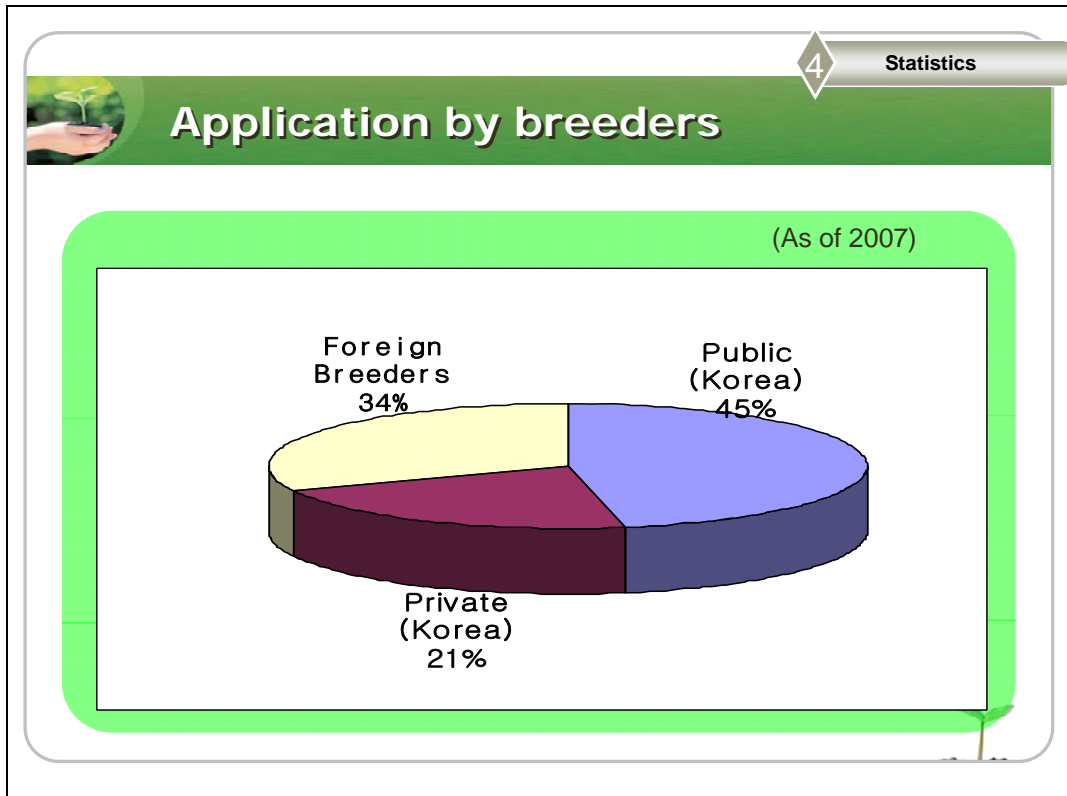
4 Statistics

### Number of rejection

(As of June 30, 2008)

	Reason of rejectoin					
	Total	Novelty	D	U	S	Others
<b>Total</b>	<b>109</b>	<b>9</b> (8%)	<b>36</b> (33%)	<b>38</b> (35%)	<b>10</b> (10%)	<b>16</b> (15%)
<b>Agriculture</b>	<b>20(18%)</b>	<b>0</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>2</b>
<b>Vegetables</b>	<b>36(33%)</b>	<b>2</b>	<b>16</b>	<b>9</b>	<b>3</b>	<b>6</b>
<b>Fruits</b>	<b>5(4.6%)</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Ornamentals</b>	<b>46(42.2%)</b>	<b>6</b>	<b>5</b>	<b>24</b>	<b>4</b>	<b>7</b>
<b>Mushroom</b>	<b>2(1.8%)</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>




\* Denomination as a rejection reason is not included



5 Others

## Appeal : case 1




Variety / Species	"K" variety / radish
PVP examination result	Rejection
Reason of rejection	Not distinct (by note)
Appeal committee	Another DUS test in other institute
Trial against rejection ruling	Distinct (by t-test)

5 Others

## Appeal : case 2

Variety / Species	"B" variety / Chinese cabbage X Turnip
PVP examination result	Rejection
Reason of rejection	Not uniform
1 <sup>st</sup> Trial against rejection ruling	- Judgement against for applicant
2 <sup>nd</sup> Trial against rejection ruling	- Judgement against for applicant
Problem	Lack of uniformity guideline for interspecific variety

5 Others

**Appeal : case 3**

Variety / Species	"A" variety / Rose
PVP examination result	PVP Registration (Distinctness in 17 characteristics)
Appeal	Breeder of "S" variety
Reason of appeal	"A" is EDV of "S" ( "A" is selected from natural mutation of "S" )
Decision of appeal committee	Rejection of appeal ( EDV matter is not scope of responsibility of committee)

5 Others

**Seed Council**



Establishment	10-15 members in MIFAFF
Roles	<ul style="list-style-type: none"> <li>- Advice to development of seed industry, PVP, NL</li> <li>- Examination of arbitration decision on grant of non-exclusive license</li> <li>- <b>Arbitration of dispute of infringement between seed companies</b></li> </ul>
Arbitration committee	<ul style="list-style-type: none"> <li>- Three members</li> <li>- Arbitration within 1 year after arbitration application</li> </ul>

5 Others

## International cooperation

Host UPOV TWP session

Year	TWP	Venue
2004	38 <sup>th</sup> TWV	Seoul
2005	38 <sup>th</sup> TWO	Seoul
2006	10 <sup>th</sup> BMT	Seoul
2007	38 <sup>th</sup> TWF	Jeju
2008	26 <sup>th</sup> TWC	Jeju
2009	38 <sup>th</sup> TWA	

5 Others

## International cooperation



PVP Training program

O Contents

- PVP of Korea (Law, DUS)
- PVP under UPOV system

O Financial support : KOICA  
(Korea International Cooperation Agency)

Year	No. of countries	No. of trainees
2007	12	12
2008	13	17



[Annex IV follows]

**UPOV**

# **RECENT DEVELOPMENTS IN UPOV**

UPOV

## OVERVIEW

- UPOV Membership
- Time flexibility of UPOV sessions
- People & posts
- Distance learning / training trainers
- Symposium on contracts
- CBD letter
- Electronic application systems
- Explanatory notes (UPOV Convention)
- TC items beyond TWP agenda

UPOV

## MEMBERSHIP OF UPOV

**65 Members**  
(64 States and the European Community)

### New Members:

Turkey                      November 18, 2007

### Draft Laws examined    Council Session    Advice

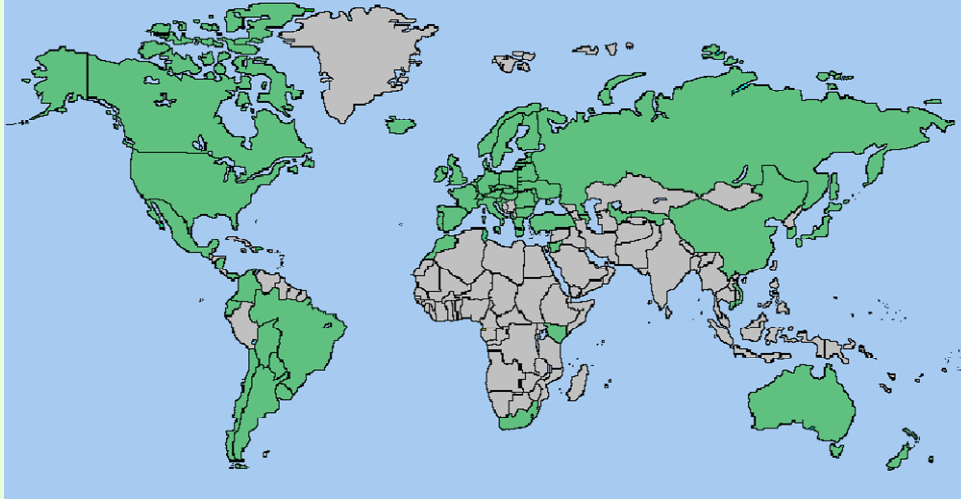
Montenegro	October 25, 2007	amended Law to be submitted to Council
FYR Macedonia	April 11, 2008	amended Law to be submitted to Council
Serbia	April 11, 2008	positive (amendments of draft law required)
Montenegro	April 11, 2008	positive (amendments of draft law required)
Costa Rica	April 11, 2008	positive



UPOV

## UPOV Membership/Territories covered

65 members

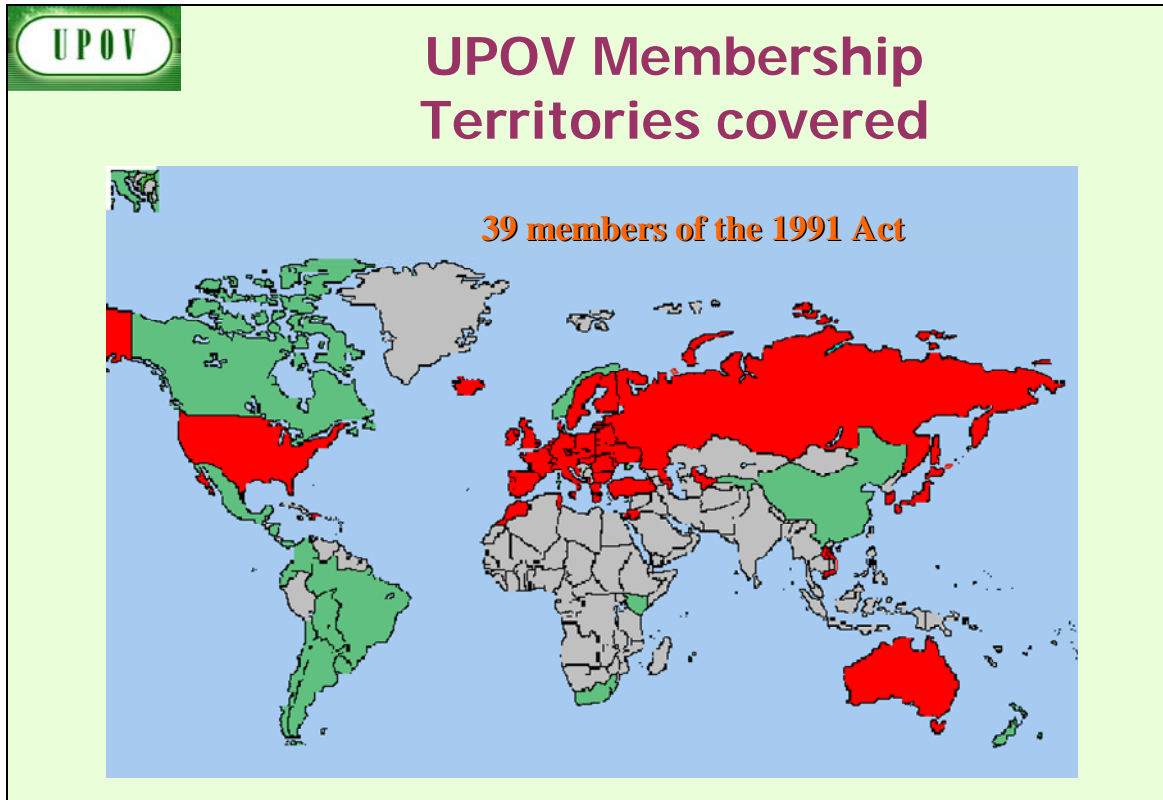


UPOV

## Members of UPOV (green) and initiating States and organizations (yellow)

Initiated the Procedure  
17 States  
1 intergovernmental organization





**UPOV**

## COUNCIL (October 2007)

The Council elected, in each case for a term of three years ending with the forty-fourth ordinary session of the Council, in 2010:

- (a) **Mrs. Carmen Amelia M. Gianni** (Argentina), **Chairperson of the CAJ** (Administrative and Legal Committee);
- (b) **Mr. Lü Bo** (China), **Vice-Chairman of the CAJ**; and
- (c) **Mr. Chris Barnaby** (New Zealand), **Chairman of the Technical Committee**.

In April, 2008, the Technical Committee *proposed to the Council* to elect:

**Mr. Joël Guiard** (France),  
**Vice-Chairman of the Technical Committee**.

UPOV

## **COUNCIL** (October 2007)

In recognition of his outstanding contribution to UPOV, the Vice Secretary General awarded to **Mr. Bernard Le Buanec**, Secretary General of ISF, a **UPOV Gold Medal**.

UPOV

## **Consultative Committee**

### **Efficiency, effectiveness and time flexibility of UPOV sessions**

- Time flexibility after approval of calendar of meetings
- Preliminary examination (CC) and examination of laws (C); observers invited to comment
- Mailing concerning UPOV sessions: invitations and reports by electronic means exclusively

UPOV

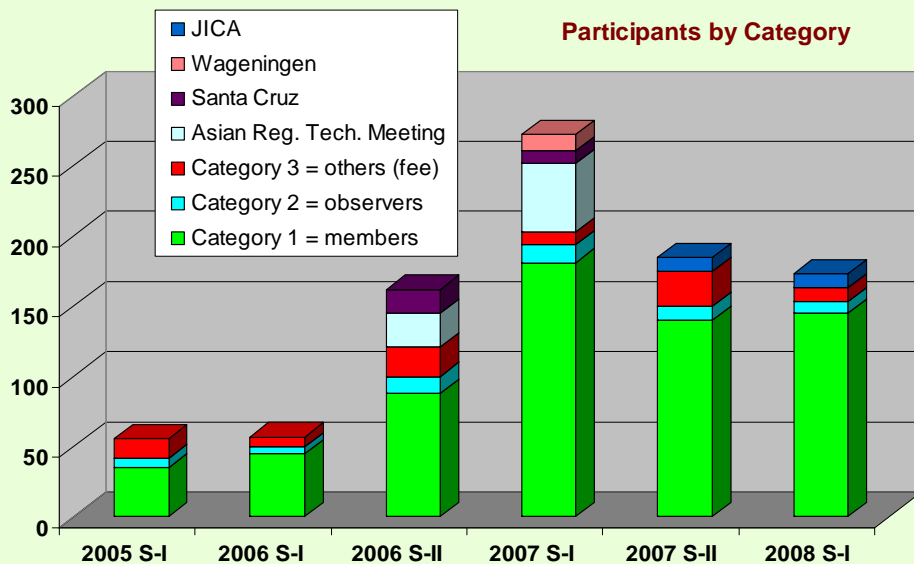
## Consultative Committee

### Distance Learning Course

noted the developments concerning the  
UPOV Distance Learning Course (DL-205)...

UPOV

## Distance Learning Courses



UPOV

## Consultative Committee

### Distance Learning Course

noted the developments concerning the UPOV  
Distance Learning Course (DL-205)  
and

endorsed the development of an advanced course  
**“Examination of Applications for Plant  
Breeder’s Rights”** and entrusted the Office of  
the Union to take the necessary actions to  
develop and implement that course  
(will be based on TGP documents)

UPOV

### Training of Trainers in Plant Variety Protection (PVP) USPTO, Washington, February 25 to 29, 2008

- 21 participants
- Purpose: provide training on the UPOV System of Plant Variety Protection, including presentation skills
- Enabling to act independently as trainer in seminars, workshops organized by UPOV and others using UPOV materials

UPOV

## Symposium on Contracts in relation to Plant Breeders' Rights

- Purpose: provide information to authorities and breeders on practices and experiences under different jurisdictions
- Date: October 31, 2008
- Venue: UPOV headquarters, Geneva

UPOV

## Letter to the Convention on Biological Diversity (CBD)

[...] the Council of UPOV [...] decided to:

“request the Conference of the Parties of the Convention on Biological Diversity (CBD), at its Ninth Meeting, to consider the inclusion of the following elements in a decision relating to [...] Access and Benefit-Sharing [...]:

“1. In the first page (considerations):

*Recognizing* that UPOV supports the view that the Convention on Biological Diversity (CBD) and the UPOV Convention should be mutually supportive.<sup>1</sup>

“2. In the guidance for further negotiation of an international regime on access to genetic resources and benefit-sharing:

Further instructs the *Ad Hoc* Open-ended Working Group on Access and Benefit-Sharing that any provisions which it develops for an international regime on access to genetic resources and benefit-sharing should ensure mutual supportiveness with the UPOV Convention.<sup>2</sup>”

<sup>1</sup> UPOV's reply of 2003 is included in document UNEP/CBD/WG-ABS/3/INF/1 and can be found at: [http://www.upov.int/en/news/2003/intro\\_cbd.html](http://www.upov.int/en/news/2003/intro_cbd.html). See paragraph 3 of UPOV's reply of 2003.

<sup>2</sup> See paragraph 16 of UPOV's reply of 2003.

UPOV

## CAJ

### ELECTRONIC APPLICATION SYSTEMS

Meeting (April 2008): two concrete proposals resulted from discussions:

- (a) **survey on "core" questions** in the UPOV Model Application Form; and
- (b) **pilot project**, for a small number of crops, consisting of a downloadable application form, with or without a technical questionnaire, for testing in cooperation with breeders' organizations and a number of authorities.

=>only **very limited interest**

on CAJ agenda October 2008 in order to review the situation


UPOV


## CAJ

### INFORMATION MATERIALS: EXPLANATORY NOTES ON THE UPOV CONVENTION

⇒ **Drafting guidance for Laws**

⇒ **Practical information for implementation**

 <h2 style="text-align: center;">Explanatory Notes</h2>		
Article (1991 act)	April 2008	Oct. 2008
Article 1(iv): <b>DEFINITION OF BREEDER</b> (only breeder eligible for protection) Article 1(vi): <b>DEFINITION OF VARIETY</b> (variety ≠ protected variety)		First draft for <b>CAJ-AG</b>
Article 6: <b>NOVELTY</b> (acts which may be considered <u>not</u> to result in the loss of novelty)	<b>CAJ</b>	<b>CAJ</b>
Article 11: Right of <b>PRIORITY</b>		correspondence
Article 12: <b>EXAMINATION OF THE APPLICATION</b>	No further work (see TGP)	
Article 13: <b>PROVISIONAL PROTECTION</b>		correspondence

 <h2 style="text-align: center;">Explanatory Notes</h2>		
Article (1991 act)	April 2008	Oct. 2008
Article 14(2): Acts in respect of <b>HARVESTED MATERIAL</b> / Article 16: <b>EXHAUSTION</b> of the Breeder's Right (authorization / permission: in UPOV member)	<b>CAJ-AG</b>	<b>CAJ-AG</b>
Article 14(5): <b>ESSENTIALLY DERIVED AND CERTAIN OTHER VARIETIES</b>	<b>CAJ</b>	CAJ to consider CIOFORA comments
Article 15: <b>EXCEPTIONS TO THE BREEDER'S RIGHT</b> (farm-saved seed)	<b>CAJ</b>	<b>CAJ</b>
Article 21: <b>NULLITY</b> Article 22: <b>CANCELLATION</b>		correspondence
Article 30(1)(i): legal remedies for the effective <b>ENFORCEMENT OF BREEDERS' RIGHTS</b> (list of possible measures)		<b>CAJ-AG</b>



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Developments at the 44th session  
(April 2008)  
of the

## TECHNICAL COMMITTEE

(not on the TWP agenda)

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*The Technical Committee proposed to the  
Council that it elect as:*

- TC Vice-Chairperson: Mr. Joël Guiard (France)

Chairpersons -

- TWA: Mr. Dirk Theobald (European Community)
- TWC: Mr. Gerie van der Heijden (Netherlands)
- TWF: Mrs. Bronislava Bátorová (Slovakia)
- TWO: Ms. Andrea Menne (Germany)
- TWV: Mrs. Radmila Safarikova (Czech Republic)
- BMT: Mr. Andy Mitchell (United Kingdom)

and the TC appointed as Chairman of the

- *Ad hoc* Crop Subroup on Mol. Tech. for Wheat and Barley:  
Mr. Michael Camlin (United Kingdom)

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## DUS-related software

- information on existence and availability of **software** for example, **databases of images / photographs, image analysis** to be more **accessible to members** of the Union
- present information, on an **annual basis in a TC document**
- TWC to formulate the structure and content of the document for consideration by the TC at its forty-fifth session.

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## Test Guidelines adopted by Technical Committee in 2008

Status	Document No.	English	Drafter	TWP
complete	TG/16/8 Annex	Rice: example varieties (North East Asia)	JP/KR/C N	TWA
TWF check	TG/22/10(proj.3)	Strawberry	JP	TWF
TWO check (Ex. Vars)	TG/24/6(proj.3)	Poinsettia	DK	TWO
published	TG/40/7	Blackcurrant	NZ	TWF
published	TG/46/7	Onion, Shallot	NL/FR	TWV
published	TG/50/9	Grapevine	ES/DE	TWF
published	TG/60/7	Beetroot	NL	TWV
published	TG/78/4	Kalanchoe	DE	TWO
published	TG/85/7	Leek	NL	TWV
published	TG/152/4	Chamomile	DE	TWV
published	TG/176/4	Osteospermum	CA	TWO

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## Test Guidelines adopted by Technical Committee in 2008

Status	Document No.	English	Drafter	TWP
published	TG/193/1	Lotus	UY	TWA
awaiting info	TG/AMARAN(proj.9)	Amaranth	MX	TWA
TWA/F check (*)	TG/COFFEE(proj.7)	Coffee	BR	TWA/F
published	TG/243/1	Festulolium	GB	TWA
published	TG/239/1	Hawthorn	MX	TWF/O
published	TG/240/1	Sea Buckthorn	SK	TWF
published	TG/241/1	Nemesia	GB	TWO
published	TG/242/1	Portulaca, purslane	JP	TWO/V
published	TG/244/1	Wild rocket	FR	TWV
published	TG/245/1	Garden Rocket	FR	TWV
published	TG/238/1	Tea	CN	TWA/O

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## Test Guidelines

- **249 Test Guidelines** adopted
- Further **62<sup>#</sup> to be discussed** in 2008  
(19 revisions / 43 new Test Guidelines)  
(29 "final" draft stage)

# plus 2 short-notice partial revisions and 2 corrections (TWO)



**THANK YOU**

[End of annex and of document]