



Disclaimer: unless otherwise agreed by the Council of UPOV, only documents that have been adopted by the Council of UPOV and that have not been superseded can represent UPOV policies or guidance.

This document has been scanned from a paper copy and may have some discrepancies from the original document.

Avertissement: sauf si le Conseil de l'UPOV en décide autrement, seuls les documents adoptés par le Conseil de l'UPOV n'ayant pas été remplacés peuvent représenter les principes ou les orientations de l'UPOV.

Ce document a été numérisé à partir d'une copie papier et peut contenir des différences avec le document original.

Allgemeiner Haftungsausschluß: Sofern nicht anders vom Rat der UPOV vereinbart, geben nur Dokumente, die vom Rat der UPOV angenommen und nicht ersetzt wurden, Grundsätze oder eine Anleitung der UPOV wieder.

Dieses Dokument wurde von einer Papierkopie gescannt und könnte Abweichungen vom Originaldokument aufweisen.

Descargo de responsabilidad: salvo que el Consejo de la UPOV decida de otro modo, solo se considerarán documentos de políticas u orientaciones de la UPOV los que hayan sido aprobados por el Consejo de la UPOV y no hayan sido reemplazados.

Este documento ha sido escaneado a partir de una copia en papel y puede que existan divergencias en relación con el documento original.

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL COMMITTEE

Twenty - seventh Session

Geneva, October 16 to 18, 1991

MATTERS ARISING FROM THE 1991 SESSIONS OF THE TECHNICAL WORKING PARTIES
TO BE DEALT WITH BY THE TECHNICAL COMMITTEE

Document prepared by the Office of the Union

This document summarizes, in its Annex I, matters arising from the 1991 sessions of the Technical Working Parties which have to be dealt with by the Technical Committee (hereinafter referred to as "the Committee"). They comprise: (i) questions presented by the Technical Working Parties to the Committee; (ii) important decisions taken by the Technical Working Parties and communicated to the Committee for information; (iii) matters dealt with by the Technical Working Parties on the instructions of the Committee or in preparation for discussions planned in the Committee under separate agenda items. The headings of the different items are listed on pages 1 and 2 of Annex I.

To shorten references to the various Technical Working Parties in this document, use is made of the following codes that designate their documents:

TWA - Technical Working Party for Agricultural Crops;
TWC - Technical Working Party on Automation and Computer Programs;
TWF - Technical Working Party for Fruit Crops;
TWO - Technical Working Party for Ornamental Plants and Forest Trees;
TWV - Technical Working Party for Vegetables.

[Annex I follows]

MATTERS ARISING FROM THE 1991 SESSIONS OF THE TECHNICAL WORKING PARTIES
TO BE DEALT WITH BY THE TECHNICAL COMMITTEE

<u>Table of Contents</u>	<u>Paragraphs</u>
Definition of Variety	1 - 5
- Expression of the Characteristic	1 - 2
- At Least One Characteristic	3 - 5
Essentially Derived Varieties	6 - 8
Programs Which Can Be Readily Assimilated into Other Plant Variety Computer Systems	9 - 10
Common Data Structure for Data from Electrophoresis Tests or Other New Methods	11 - 13
Computer Format for Variety Description Transfer	14 - 15
Standardized Variety Description	16 - 17
Similar Variety	18 - 20
Access to Data Bases of UPOV Member States and Central Computerized Data Base	21 - 27
Collection of Gazette Entries	28 - 29
Gazettes in Electronic Form	30 - 31
Review of Documents on Statistical Methods Discussed During Past Sessions of the TWC	32 - 33
Statistical Methods	34 - 35
Combined Over-Years Distinctness (COYD) Analysis	36 - 39
Long-Term Least Significant Difference (LSD)	40 - 41
Testing of Homogeneity in Self-Fertilized Plants and Vegetatively Propagated Varieties	42 - 45
Combined Over-Years Uniformity (COYU) Criterion	46 - 48
Quantity of Plant Material to Be Supplied by the Applicant	49 - 50
Plant Material from Tissue Culture	51 - 53

<u>Table of Contents (continued)</u>	<u>Paragraphs</u>
Submission of Plants From Seed Propagated Varieties	54 - 55
Notions of Rape Varieties	56 - 57
Variety Denomination Classes for Brassica	58 - 60
Umbrella Varieties	61 - 62
Order of Physiological Characteristics	63 - 64
Order of Grouping Characteristics	65 - 66
Obsolete Varieties	67 - 68
Varieties With Numerous Clones	69 - 70
Amended Technical Questionnaire and Variety Description Form	71 - 72
List of Reference Books and Documents	73 - 74
New Methods, Techniques and Equipment in the Examination of Varieties	75 - 89
- Color Observations	75 - 77
- Electrophoresis	78 - 83
- Image Analysis	84 - 85
- Polymorphism	86 - 87
- Other New Methods	88 - 89
Cooperation with Breeders in the Testing of Varieties	90 - 99
Minimum Distances Between Varieties	100 - 103
Definition and Testing of Hybrid Varieties	104 - 108

* * * * *

Definition of Variety

1. Expression of the Characteristic. With respect to the definition of variety in the 1991 text of the UPOV Convention, the TWO had difficulties with the words "defined by the expression of the characteristics ... resulting from a ... genotype ..." It wondered if they meant that two varieties which presented the same phenotype, but had a different genotype, would not be distinguishable and raised the question of how results from the use of RFLPs should be interpreted; did they indicate the expression of a genotype or the genotype itself? Several experts were of the opinion that with RFLPs an expression of the genotype was observed. The expert from Italy promised to prepare an explanation of that understanding.

(see TWO/24/12 Prov., paragraph 12)

2. The Committee is invited to note the above information and to consider possible steps to be taken.

3. At Least One Characteristic. The TWC had a general discussion on the meaning of the words "at least one characteristic" in the definition of the term "variety." The words would again open up the question of the use of multi-variate analysis for distinction purposes. Several experts expressed their view that multi-variate analysis of all characteristics might lead to something that could not be considered a predefined characteristic and might not be meaningful. A selection of certain characteristics, such as shape, which would be separated into several measured characteristics to be evaluated by multi-variate analysis, would make sense on the other hand. The TWC agreed that it should be left to the crop expert to decide. If the expert used multi-variate analysis to support differences determined visually (e.g. bulb form, leaf shape, etc.), that analysis would be a good tool. It further agreed that Dr. Weatherup (United Kingdom), in cooperation with Mr. Van der Heijden (Netherlands), should draw up by the end of the year a paper that went into the question in detail and gave some examples of meaningful characteristics.

4. The TWO discussed at length whether the words "distinguished ... by ... at least one ... characteristic" included the application of multi-variate analysis. The majority took the position that it was impossible to exclude that method from distinctness testing as the testing authorities would otherwise lose touch with reality. The application to predefined or derived characteristics like shape, observed through measurement of length and width, was not expected to create problems. The application to all observed characteristics, however, would require further study. The question was raised whether small differences in a number of characteristics could be sufficient to establish distinctness in the absence of a large difference in one single characteristic. The TWO agreed to continue the discussion on the basis of a document, to be prepared by experts from the United Kingdom (Mrs. Campbell), on varieties of chrysanthemum which would have been difficult to distinguish without multi-variate analysis and of another document to be prepared by experts from Germany.

(see TWC/9/12 Prov., paragraph 6, TWO/24/12 Prov., paragraph 13)

5. The Committee is invited to note the above information and to consider possible steps to be taken.

Essentially Derived Varieties

6. The TWF noted that in its field of competence the new criterion of "essentially derived variety" would have an important impact on the creation of new varieties. All depended on the way in which varieties were normally bred. The species that would be most affected were those in which mutation breeding was common, such as apples, where most new varieties were mutants of existing varieties and so in future might have to be considered essentially derived. That might carry the risk of any mutants found in future being just ignored and no longer leading to new varieties, as the finder would not be able to produce an independent variety, and society would be deprived of such improvements. Another open point would be how to prove that a new mutant was derived from a protected variety which itself was a mutant from an unprotected variety, but not from that which the applicant was claiming. The TWF finally agreed to collect information on apple varieties that at present were included in national lists, either protected or as candidates under test, and ascertain whether those varieties would have to have been considered essentially derived if the new criterion had already been in force. If so, the variety from which they had to be considered essentially derived should be indicated.

7. The TWO had mixed feelings as to the practical application of the new criterion of essential derivation and wondered in how far the national offices would be involved in checking whether the criterion had been fulfilled. Several experts insisted that the new criterion should not affect the present minimum distance and in particular should not be allowed to reduce that distance.

(see TWF/22/4 Prov., paragraphs 14 to 16, TWO/24/12 Prov., paragraph 14)

8. The Committee is invited to note the above information and to consider possible steps to be taken.

Programs Which Can Be Readily Assimilated into Other Plant Variety Computer Systems

9. The TWC will continue updating Annex VIII to document TWC/VI/13, containing an overview of the various programs.

(see TWC/9/12 Prov., paragraph 34)

10. The Committee is invited to note the above information.

Common Data Structure for Data from Electrophoresis Tests or Other New Methods

11. The TWC recalled document TWC/VIII/3 on a Common Data Structure for Electrophoretic Data, which raised two main points, namely (i) general principles for computer data base structures with respect to international harmonization and exchange of information; and (ii) a proposal for a data base design using a relational model for electrophoretic data. The document had been circulated to the members of the Technical Working Party for Agricultural Crops and the Technical Working Party for Vegetables, and also to the TWA Subgroup on Electrophoresis in Cereals for comments. The TWC was also informed of an ISTA paper on the statistical handling of electrophoretic data, and some other references which would be circulated to its members, via the UPOV Office, by the German and Dutch experts.

12. The TWA noted document TWC/VIII/3 and asked the Subgroup on Electrophoresis in Cereals to consider the document once it had completed the other more urgent tasks given to it.

(see TWA/20/9 Prov., paragraph 31, TWC/9/12 Prov., paragraphs 24 and 25)

13. The Committee is invited to note the above information.

Computer Format For Variety Description Transfer

14. The TWC noted the idea of using delineating characters in the transfer of variety descriptions in order to obviate the sending of the whole variety description form by making it possible to send only the answers. Several different delineating characters would be necessary, however, for instance to distinguish between the numbers of the questions, between the columns, between UPOV characteristics and other characteristics, and so on. Mrs. Campbell (United Kingdom) would prepare a paper on the subject by March 1992. The transfer of such data would also require only simple software to reprint the full variety description form. A further question left to the receiving office was how to read the information in its own data base.

(see TWC/9/12 Prov., paragraph 31)

15. The Committee is invited to note the above information.

Standardized Variety Description

16. The TWC noted the introduction given by Mr. Deneken (Denmark) to document TWC/9/10 on Between-Center Standardization of Variety Descriptive Scores Based on Continuous Measurements, drawn up on the basis of document TWC/VII/19, which outlined a method for standardizing between countries those variety descriptive scores that were based on continuous measurements in the cereal Test Guidelines at present under revision. In cooperation with Miss Rasmussen (Denmark), certain characteristics had been selected in order to produce an objective set of scores for varieties that two or more countries had in common, which could then be used in each country to estimate scores for new varieties that would be compatible between the countries. The method seemed to be acceptable only for some characteristics and crops, and needed further study before it could be recommended.

(see TWC/9/12 Prov., paragraphs 29 and 30)

17. The Committee is invited to note the above information.

Similar Variety

18. The TWV noted document TWC/VIII/15 on similar varieties. It agreed that the document was useful for experts wishing to apply it in the presence of numerous measured characteristics. In the TWV's field of competence it might be applied to certain species such as onions and carrots. For most other

species, it was seen to be of little use as few characteristics were measured and most would be assessed visually. The TWV would start from the other end in preparing the testing, in other words, instead of searching for similar varieties, it would delete from the list of varieties all those that were clearly dissimilar. It would work mainly with grouping characteristics and therefore deal with small groups which could be readily overseen. Consequently, the need for extensive computer programs was seldom felt.

19. The TWC noted document TWC/9/7 on the calculation of similarities between varieties using electrophoretic data. The calculation involved two different sets on potato varieties and on varieties of Lolium. For electrophoresis bands where no genetic information or physical interpretation was available, Gower's similarity index seemed to be a suitable tool, otherwise the phi-squared index might be used. There were different needs for the calculation of similar varieties, whether it was in order to find similar varieties to be grown alongside the candidate variety or to specify them in the final variety description. The TWC finally agreed to close the discussion on that subject unless the crop experts came up with well-formulated wishes or questions.

(see TWV/24/10 Prov., paragraph 11, TWC/9/12 Prov., paragraphs 27 and 28)

20. The Committee is invited to note the above information.

Access to Data Bases of UPOV Member States and Central Computerized Data Base

21. The TWC noted the results of the discussions held by the Technical Committee on the question of the access that the authorities of member States responsible for plant variety protection and testing could have to data held by the offices of other member States, which were reproduced in document TC/26/5, paragraph 20. The Technical Committee had recognized the usefulness of that kind of access, but had pointed out that some categories of information might present problems. It had asked the Technical Working Parties, as a first step, to study the possibilities for the exchange, in electronic form via diskettes, of published information between member States.

22. The TWC also noted document TWC/9/4, which reviewed the question of international access to data as dealt with by the TWC during the past four years. The document listed (i) the type of information that member States exchanged at present, (ii) the ways in which that information was transmitted (hard copy, fax, floppy disk or magnetic tape, international network or inter-rogation of international data bases), including advantages and disadvantages, (iii) the experience within UPOV and (iv) the way forward. A slightly revised version of that document is reproduced in document TWC/9/4 Rev.

23. The TWA emphasized that, in its area, it would be interested in the possibility of exchanging in electronic form lists of varieties under test, since they contained very useful information that would raise no problems for the authorities. It would also be of interest to put all published information into one single data base, together with a sorting mechanism that would allow access to information on a given crop provided by all member States. It therefore asked the Technical Working Party on Automation and Computer Programs to devote special attention to such an exchange or to a centralized data base.

24. The TWF discussed the possibilities of the international exchange in electronic form of data published in official gazettes, and repeated its wish for such an exchange, which would be an improvement on the present exchange on paper of the lists of varieties under test. The TWF would prefer to have the data collected and incorporated in a single data base, which would be done on an international basis by UPOV, as that would be cheaper than if each member State were to individually collect and transfer into its own data base all the information published in the various gazettes. The internationalization of plant variety protection would require member States to keep abreast of the international situation. It would be necessary to have easy access and combine all published information with respect to a given variety or species. That could be most easily ensured if all information were collected centrally. It could then be made available periodically via electronic mail or optical disk to all UPOV member States or via direct access to the data base. This kind of electronic exchange would enable the offices of member States to have faster and less labor-intensive access to data already published in the official gazettes. At present, national offices already received requests for information on particular varieties or species that were difficult, if not impossible, to satisfy.

25. The TWO noted document TWC/9/4 Rev. on International Access to Data. It had a long discussion on the usefulness of such international access. It realized that in the field of ornamental species there was a particular need to have access to data of other member States since many ornamental varieties were grown and protected in many States at the same time, contrary to other species where varieties often had only national or limited regional importance.

26. The TWO therefore proposed to the Technical Committee that UPOV should immediately start studying the usefulness of setting up a central computerized data base, as only such a central data base could overcome certain difficulties raised against direct access to individual national data bases. The study should include the questions of which savings such a data base could make, what other improvements it would bring, what kind of information it would have to store and whether an existing system could be adapted for use of that data base. In view of the urgency of the matter and in order to enable the Technical Committee to formulate during its October session a proposal to the Council--which would discuss the UPOV budget for the coming two years--the TWO decided to prepare a technical questionnaire (see Annex II) concerning a central computerized data base. The answers would be used to prepare a document for the Technical Committee, supporting the TWO's proposal. Mrs. Campbell (United Kingdom) offered to draft the final document (see document TC/27/7) on the basis of answers received to the questionnaire.

(see TWA/20/9 Prov., paragraph 12, TWC/9/12 Prov., paragraphs 32 and 33, TWF/22/4 Prov., paragraph 11, TWO/24/12 Prov., paragraphs 21 to 24)

27. The Committee is invited to take the necessary decisions.

Collection of Gazette Entries

28. The TWO noted the efforts made by some member States in collecting all data concerned with varieties of selected species. The main difficulties encountered at present were the fact that the information in question existed only on paper, that it was sometimes difficult to print out and sometimes difficult to obtain from certain UPOV member States. The experts therefore agreed to continue their efforts.

(see TWO/24/12 Prov., paragraph 26)

29. The Committee is invited to note the above information and to consider possible steps to be taken.

Gazettes in Electronic Form

30. As the study for a central computerized data base would take some time, the TWO proposed, as an intermediate step, to invite member States to offer the information published in the national gazettes in electronic form also (on floppy disk for instance) and to invite UPOV to work on a standardized system of exchange.

(see TWO/24/12 Prov., paragraph 25)

31. The Committee is invited to take the necessary decisions.

Review of Documents on Statistical Methods Discussed During Past Sessions of the TWC

32. The TWC would prepare lists of documents on statistical methods discussed during its past sessions, highlighting the most important documents on each subject and the most detailed description of a given method, and also including certain Technical Committee documents on the subject. It agreed on an index system to facilitate the tracing of documents. All future documents to be prepared for the Working Party would therefore be given keywords by their authors. The keyword would appear immediately after the title of a given document.

(see TWC/9/12 Prov., paragraphs 36 and 37)

33. The Committee is invited to note the above information.

Statistical Methods

34. The TWF considered that, at present, statistical methods did not play an important role in the fruit species area, as most observations were made visually and in many cases the number of plants observed was too small. With the application of new methods, the evaluation of results by statistical means would become necessary. It would therefore continue its discussions on that subject during its next session. The question was raised whether or not, in the testing of clones, each plant could be considered a replicate.

(see TWF/22/4 Prov., paragraphs 24 to 26)

35. The Committee is invited to note the above information.

Combined Over-Years Distinctness (COYD) Analysis

36. The TWC agreed to amend the abbreviations from COY to COYD and from COU to COYU to align the two abbreviations. The TWC agreed to adapt the computer program for use on a PC. In addition, the handling of missing data should be included as well as the possibility of combining the two-years and three-years

data sets. Dr. Weatherup (United Kingdom) would circulate the amended program by the end of November. During the TWC session it became apparent that at present COYD analysis was used only by five States for grasses, clover, rape, luzerne, sunflower, field beans and sugar beet. The TWC considered further possible steps to ensure broader use but saw no need for further action apart from the adaptation for use on a PC. At the national level, computer experts should approach crop experts and try to convince them to use COYD. Dr. Weatherup (United Kingdom) would additionally prepare a simpler and more user-friendly explanation of the method.

37. The TWF stated that for most fruit species COYD analysis did not apply because the measured characteristics were so few. For pineapple and banana, however, studies were under way that would take more time. The problems associated with clones and mutants in certain species might in future lead the Working Party to reconsider its position vis-à-vis certain species. The measuring of certain characteristics could lead to smaller minimum differences.

38. The TWV noted that no progress had been made with the application of the Combined Over-Years Distinctness (COYD) criterion. One of the reasons was that it required more statistical work to be done which, because of the few measured characteristics, had not been justified for vegetable species. In addition, a number of technical and organizational difficulties had been encountered, including a lack of the necessary hardware, a lack of software (only very few countries had software) and a lack of experts to operate it. The software was considered not to be user-friendly for experts who rarely had to handle measured characteristics. Finally, the Technical Committee was asked to review its past recommendation regarding the use of COYD analysis for vegetable species. In the meantime the TWV would continue to use the old UPOV criterion in those few cases of measured characteristics until a way out of the present difficulties was found after some more intensive studies.

(see TWC/9/12 Prov., paragraphs 7, 10 to 12, TWF/22/4 Prov., paragraph 10, TWV/24/10 Prov., paragraphs 12 and 13)

39. The Committee is invited to take the necessary decisions.

Long-Term Least Significant Distance (LSD)

40. The TWC recalled document TWC/VIII/10 on the estimation of COYD variance and long-term LSD, which addressed two problems, namely how to calculate LSD from a small number of varieties and the variation of characteristics which in many species depended on their expression. It finally agreed that experts from Denmark would study long-term LSD further on spring rape and perennial ryegrass, while experts from The Netherlands did the same on perennial ryegrass and Dr. Weatherup (United Kingdom) did so on ryegrass, and that experts from Germany would specify further the problems encountered so far. The studies should cover different methods in order that the best might be found by simulation from large data sets. In the meantime, for distinctness on small data sets, the old UPOV method should continue to be used.

(see TWC/9/12 Prov., paragraphs 8 and 9)

41. The Committee is invited to note the above information.

Testing of Homogeneity of Self-fertilized and Vegetatively Propagated Varieties

42. The TWA asked the Technical Working Party on Automation and Computer Programs to study the question of the rule of doubling the number of off-types from Table 11 in document TC/XXV/8 in the case of mainly self-pollinated varieties, according to the rules set out in the General Introduction to the Test Guidelines (see paragraph 29) in comparison with possible use of Table 10 or the possibility of also indicating in Table 11 sample sizes for intermediate figures of k (1.5; 2.5; 3.5 etc.), which could then be doubled for the above cases.

43. The TWC noted the problems encountered by the TWA with the tables in document TC/XXV/8 and those arising from the doubling of the number of off-types for mainly self-fertilized varieties according to the General Introduction to the Test Guidelines. It proposed to the Technical Committee that it amend the latter rule and recommend instead a change in the population standard (in most cases a doubling, but for certain species even a tripling). This would give the rule a statistically sounder basis.

44. The TWC cleared up a misunderstanding concerning the recipients of document TC/XXV/8. The tables had been compiled to facilitate the Technical Working Parties' task of choosing the most appropriate sample size for each species, which should then be included in the individual Test Guidelines and complied with by all member States. The TWC felt the need to explain to the crop experts, in a more detailed and easily understandable manner, how to devise a sampling scheme and the meaning of the various parameters, and would prepare a paper to that purpose.

(see TWA/20/9 Prov., paragraph 13, TWC/9/12 Prov., paragraphs 22 and 23)

45. The Committee is invited to take the necessary decisions.

Combined Over-Years Uniformity (COYU) Criterion

46. The TWC recalled the reasons behind the program for the testing of uniformity using the Combined Over-Years Uniformity (COYU) criterion, and the basic principle of the analysis, which was to compare the candidate variety with the most similar varieties during the testing of uniformity. On the basis of information exchanged during the session, the TWC agreed to experiment during a period of two years (1991 and 1992) on grasses with the following three probability levels:

rejection after three years	0.1%	0.2%	0.5%
rejection after two years	0.1%	0.2%	0.5%
acceptance after two years	1 %	2 %	5 %

Rejection after two years would not be mandatory for all member States. Member States already wishing to apply the levels indicated in the center column for decisions on uniformity would be free to do so, while those having problems with the levels could still use the old uniformity criterion. The TWC confirmed that all characteristics used for distinctness purposes should also be checked for uniformity. It noted that some member States used a larger number of characteristics for distinctness purposes than others and that in those States the risk of rejecting a variety for lack of uniformity was greater. That was also the reason why those States found it more difficult to accept higher levels.

47. The TWA agreed to study the COYU criterion and apply it as soon as the significance level had been fixed by the TWC.

(see TWA/20/9 Prov., paragraph 14, TWC/9/12 Prov., paragraphs 13 to 21)

48. The Committee is invited to note the above information and to consider possible steps to be taken.

Quantity of Plant Material to be Supplied by the Applicant

49. The TWA noted paragraph 43 of document TC/26/5 on the differences in the indication in the Test Guidelines of the quantity of plant material to be supplied by the applicant (either per year or for the total testing period). It agreed that, whatever wording was used, it would have to ensure that the first submission would constitute the reference sample which had to be used to identify the variety and test uniformity. The TWA preferred an indication of the total amount of seed or plant material needed for testing and for the reference sample. For agricultural crops, one single seed submission would normally be required, but the situation could change according to the species dealt with. In future, the TWA would be more specific in the Test Guidelines, fixing species by species whether one only or several seed submissions would be recommended. The TWV preferred to indicate the quantity needed for each year of testing, as the length of the test could not be definitely determined on the date of application. The TWF and TWO saw no problems as plant material would in general be requested only once in their fields of competence.

(see TWA/20/9 Prov., paragraph 7, TWF/22/4 Prov., paragraph 9, TWO/24/12 Prov., paragraph 9, TWV/24/10 Prov., paragraph 8)

50. The Committee is invited to note the above information and to consider possible steps to be taken.

Plant Material From Tissue Culture

51. The TWF noted paragraph 34 of document TC/26/5, and the request from the Technical Committee to report back to it on any problems involved with the different methods of propagation and their possible effect on testing. It considered that, when this propagation was properly done, the mutation rate was no higher than with other methods of propagation and so no increase in sample size was necessary. In addition, any effect that propagation by tissue culture might have on fruits with a much longer testing period would be lost after a few years and therefore would not interfere with the test results.

52. The TWO noted that in the United Kingdom no variation was found in Chrysanthemum between plants from in-vitro culture and those from conventional propagation. Plants from tissue culture would only be used as mother plants for the production of plants for testing, however. So far, no rejuvenating effect had been observed. The TWO finally reconfirmed the position taken during its previous session that developments in this area should be closely followed. Whenever possible, it would ask the applicant to send in plant material which did not come from micropropagation and, in case of doubt, would do its own propagation.

(see TWF/22/4 Prov., paragraph 8, TWO/24/12 Prov., paragraphs 30 and 31)

53. The Committee is invited to note the above information.

Submission of Plants From Seed Propagated Varieties

54. In connection with the discussions on the Test Guidelines for Prunus Rootstocks, the TWF addressed the problem of the submission of plants of seedlings of a seed-propagated rootstock. The seed of rootstock varieties would need to be sown as fresh seed, immediately after harvesting. It was not possible, therefore, to ask for seed to be sent in for testing. When selecting seedlings and marketing his variety, the applicant would obviously choose more homogeneous plants and so the sample sent in for testing would be a representative sample of the variety marketed, but not of the variety as a whole. However, the TWF saw no alternative to accepting the submission of plant seedlings.

55. The Committee is invited to note the above information and to consider possible steps to be taken.

Notions of Rape Varieties

56. The TWA noted the outcome of the meeting of the Subgroup on Rape which had distinguished the following three groups of varieties:

(i) line varieties and narrowed populations resulting from the same progenies but differing by two generations;

(ii) hybrid varieties (to be available in about three years from controlled cross-pollination);

(iii) synthetic varieties (constituted from defined components and a fixed number of multiplications).

The Subgroup had not been able to solve the question of how to test uniformity and whether to require unthreshed plants. It had been agreed that each member State would indicate its procedure and the tolerances for uniformity. In addition, a ring test was foreseen with material of three varieties at present under application in several countries. In this ring test, varieties would be tested under two systems: (i) as line varieties with unthreshed plants and (ii) as allogamous varieties (with relative uniformity). The Subgroup agreed to observe glucosinolate only on seed harvested from the plots as the content might otherwise be open to manipulation by the breeder. It was planned to hold the next meeting in France in October. At that meeting, the Subgroup would have to study the data collected on the assessment of uniformity, try to find a solution for synthetic varieties, go through the Table of Characteristics and study the uniformity requirements for hybrid varieties, which might have to be twice those for self-pollinated varieties.

(see TWA/20/9 Prov., paragraphs 41 to 43)

57. The Committee is invited to note the above information.

Variety Denomination Classes for Brassica

58. The TWA noted Circular U 1681 containing proposals for grouping of species of Brassica for purposes of variety denomination and finally decided that it could not endorse the proposal. In addition, it pointed out that the agricultural varieties and the vegetable varieties were split into different markets and, in the present situation, no great risk of confusion existed. It therefore proposed to keep the present classes as mentioned in Annex 1 to the UPOV Recommendations on Variety Denominations (document UPOV/INF/12).

59. The TWV noted Circular U 1681, which contained proposals for grouping species of Brassica, and Circular U 1725, which opposed the changes. In an effort to find a solution for the species Brassica chinensis and Brassica pekinensis, the TWV proposed including these species in class 5 for market reasons and excluding them from class 6 in case taxonomists should decide to attribute them to Brassica rapa.

(see TWA/20/9 Prov., paragraph 32, TWV/24/10 Prov., paragraph 17)

60. The Committee is invited to take the necessary decisions.

Umbrella Varieties

61. Dr. Valvassori (European Communities) reported to the TWV that the EC had identified 111 old vegetable varieties to be re-entered by splitting them, in principle, into different varieties. Since then the Commission of the European Communities (Decision 90/639/EEC - OJ NL 348, 12.12.1990) had specified the names to be borne by the derived varieties. Member States planning to renew the acceptance of such varieties had to ensure that the varieties bore the names specified at Community level. Four had already begun to implement the Community Decision (supplement to the Common Catalogue of Varieties of Vegetable Species - OJ C 96A, 12.04.1991).

(see TWV/24/10 Prov., paragraph 10)

62. The Committee is invited to note the above information.

Order of Physiological Characteristics

63. The TWV had a general discussion on the correct place for physiological characteristics in the Table of Characteristics. It eventually concluded that they should continue, as at present, to be indicated at the end of the Table of Characteristics. Moreover, all characteristics of a given organ would be grouped together, irrespective of the time of observation.

(see TWV/24/10 Prov., paragraph 24)

64. The Committee is invited to note the above information and to consider possible steps to be taken.

Order of Grouping Characteristics

65. The TWV had a general discussion on the order of grouping characteristics in the Technical Notes. It finally agreed to indicate the characteristics in the order of their appearance in the Table of Characteristics, irrespective of the fact that the value of the characteristics might be different for grouping purposes, and that in general qualitative characteristics would be used in the first instance even if listed at the end.

(see TWV/24/10 Prov., paragraph 23)

66. The Committee is invited to note the above information and to consider possible steps to be taken.

Obsolete Varieties

67. The TWA discussed the question of how to proceed with older varieties for which seed was no longer available on the market, where no maintainer existed and a seed sample might only be available in a gene bank or other seed collection. The TWA questioned whether such a variety should still form part of the varieties of common knowledge and be compared to each new candidate variety. When setting up its reference collection, a State normally took a practical approach and only included those varieties likely to be grown or have a market in its area. It never attempted to collect all varieties from all over the globe, thus running a small risk of overlooking a variety existing in a remote country or area. The TWA therefore took the position that this balance between the risk taken in not considering a possible existing variety on one side and unjustified efforts to avoid it on the other would, as long as national law would allow, also have to apply to varieties for which seed was no longer available. However, the situation would have to be decided species by species. A decision for vegetatively propagated species, roses for example, would be completely different from that for wheat or other agricultural seed propagated species.

(see TWA/20/9 Prov., paragraph 46)

68. The Committee is invited to note the above information and to consider possible steps to be taken.

Varieties With Numerous Clones

69. The TWO noted the problem of the numerous existing clones of Norway Spruce and the fact that the present draft Test Guidelines did not allow a separation of those clones. One of the reasons for the large number of clones was the fact that legal requirements prescribed the use of many different clones for new forest plantings. Since only single clones were eligible for plant breeders' rights, the present draft document needed considerable amendment. The TWO therefore decided to enquire with the forest sector which characteristics and methods they used to distinguish the numerous clones, it being understood that many of the characteristics indicated might not fulfil the present requirements for acceptance of new characteristics. Once the characteristics were known, the issue would have to be discussed within UPOV whether this particular case of numerous clones--which was not only limited to Norway Spruce but concerned many other forest species--would justify a deviation from the present rules.

(see TWO/24/12 Prov., paragraph 15)

70. The Committee is invited to note the above information and to consider possible steps to be taken.

Amended Standard Technical Questionnaire and Variety Description Form

71. The TWO noted document TC/26/6 reproducing the amended UPOV standard technical questionnaire and the UPOV Variety Description Form. It considered the latest change--a footnote reading: "In the case of identical states of expression of both varieties, please indicate the size of the difference"--to be unfortunate, as it might be difficult to understand by applicants who would then leave that part of the Technical Questionnaire blank.

(see TWO/24/12 Prov., paragraph 7)

72. The Committee is invited to note the above information.

List of Reference Books and Documents

73. The TWO noted document TC/27/4 reproducing an updated version of the list of reference books and documents for the testing of varieties. It finally agreed to request the countries which had prepared working papers for the drafting of Test Guidelines to verify the information for the ornamental species concerned.

(see TWO/24/12 Prov., paragraph 10)

74. The Committee is invited to note the above information.

New Methods, Techniques and Equipment in the Examination of Varieties

Color Observations

75. The TWF noted the results of a subgroup meeting on color measurements, held in The Netherlands in the presence of experts from France, the United Kingdom, Germany and The Netherlands (see document TWO/24/7). The experts had concluded that color measurements might be a reliable way of assessing colors. Some equipment needed further checking, however. The assessment was based on the three-coordinates system. A link to the visible system of color charts would still have to be established. It was not intended that the minimum distance in colors should be reduced, but only that the assessment should be made more objective. The TWF concluded that the measuring of colors in its field of competence was of less importance than in the field of ornamental species. For fruit species image analysis might be more important, especially for example to separate apple mutants.

76. The TWO noted document TWO/24/7 containing the report from the subgroup meeting on color measurements held in Wageningen, The Netherlands, on January 23 and 24, 1991. It agreed to distribute the report to the other Technical Working Parties, drawing their attention to the work being done and inviting experts interested to attend the next session of the subgroup (scheduled for January 1992 in Hanover, Germany) to contact the German expert.

(see TWF/22/4 Prov., paragraph 22, TWO/24/12 Prov., paragraph 28)

77. The Committee is invited to note the above information.

Electrophoresis

78. The TWA discussed the electrophoresis method in connection with the revision of the Test Guidelines for Wheat, Barley, Oats and Maize. It considered that at present it had no other new methods to discuss, but that during its coming session it would also discuss the measuring of colors. The TWA noted a report on the subgroup meeting on electrophoresis which took place in Surgères, France, on October 16 and 17, 1990 (see Circular U 1674). It stressed that in the acceptance of electrophoretic characteristics it was very important to agree on avoiding the use of different techniques and to adopt one single standardized method. That method should be strictly applied and it should be ensured that everybody used the same material of the example varieties, if possible by setting up a centralized bank with seed samples of those varieties. The acceptance of the use of bands should be made in common, either all member States would use a given band for distinctness purposes or they would all reject it. The TWA was aware that other bands could be observed, especially in using other methods, but these should only be accepted by common agreement among all member States and not individually by one member State. The uniformity requirements would apply not only to the band needed for distinctness vis-à-vis another variety, but the whole diagram of accepted bands needed to be homogenous.

79. The TWA had lengthy discussions on the principle of the introduction of characteristics of electrophoresis and on the possible consequences of such an introduction on the notion of distinctness. The introduction of electrophoresis might be an opening for accepting any further new methods of DNA technology which could lead to accepting finally any difference between two varieties. The problems of minimum distance might thus be moved to the notion of essential derivation and left to the courts to decide. A further difficulty existed in that so far only little knowledge of the genetics and the relation of given bands to certain features was available. The possible consequences for the distinctness criterion would therefore have to be studied further during the next session on the basis of a document to be prepared by the expert from France.

80. Starting from the position taken during its previous session to use electrophoretic characteristics for Wheat, Barley and Oat varieties only as non-routine characteristics and as a last resort if other characteristics failed to establish distinctness, the TWA took the following intermediate position:

(i) electrophoretic characteristics should be included in the Table of Characteristics and not in an Annex to the Test Guidelines;

(ii) the characteristics should not have an asterisk;

(iii) it had to be studied further whether the characteristics could be used alone or only in combination with another traditional characteristic and whether a difference in one band alone would be sufficient to establish distinctness. The following possible combinations could be considered:

- (a) combination of several bands,
- (b) combination of several proteins,
- (c) combination with traditional characteristics.

The TWA considered that, as long as the above points had not been solved within UPOV, an electrophoretic characteristic alone should not be used to establish distinctness.

81. The Subgroup on Electrophoresis in cereals would have to meet on October 8 and 9, 1991, in Hanover, Germany, to study the points remaining open. All UPOV member States should receive an invitation specifying that, besides experts in electrophoresis, experts with full knowledge of the UPOV system should also participate. The Subgroup would have the following tasks:

- (i) to complete the technical work;
- (ii) to involve other laboratories in examining new material;
- (iii) to agree on one single acceptable method for each species;
- (iv) to agree on acceptable bands; and
- (v) to advise the Working Party on whether to use single bands, multiple bands or patterns.

82. The TWA noted the explanation given by the expert from France regarding electrophoresis in maize. It also noted that the use of electrophoresis for maize was under study in Germany and Spain. For the time being it was too early to take a decision of principle on the use of electrophoresis. Therefore, the TWA could only agree that it would work towards the incorporation of electrophoresis in the Test Guidelines for Maize.

(see TWA/20/9 Prov., paragraphs 11, 21 to 29, 36)

83. The Committee is invited to note the above information and to consider possible steps to be taken.

Image Analysis

84. The TWO noted that in the United Kingdom plans existed to study leaf shapes by means of image analysis. In The Netherlands similar plans existed in connection with Gerbera and in France the plans concerned roses.

(see TWO/24/12 Prov., paragraph 29)

85. The Committee is invited to note the above information.

Polymorphism

86. The TWF noted a report from Mr. R. Monet (France) on polymorphism of morphological characteristics and isoenzymes in peach. He presented the main morphological characteristics deriving from natural mutations that had been preserved in peach populations. If a mutation produced two distinct phenotypes, n mutations allowed $P = 2^n$ phenotypes to be distinguished in the population. Isozymes arose also from natural mutations, in which case the mutation affected the physical properties (e.g. electric charge) of the enzyme, the catalytic property remaining unaffected. If an enzyme solution migrated

within an electric field, a separation would occur owing to differences in electric charges. In this way it was possible to visualize different isozymes of a same enzyme. The isozyme pattern was a genotypic characteristic and could be used to differentiate cultivars.

(see TWF/22/4 Prov., paragraph 21)

87. The Committee is invited to note the above information.

Other New Methods

88. The TWF further noted short reports on the study of electrophoresis, image analysis, RFLPs and color measurements in some of the member States. It agreed to improve that information, in that all member States would send a summary to the Chairman with information on their studies on the above or any other methods by the end of October 1991 for the preparation of a document for the next session.

(see TWF/22/4 Prov., paragraph 23)

89. The Committee is invited to note the above information.

Cooperation with Breeders in the Testing of Varieties

90. Examination in the United States of America. The TWA noted document TWA/20/7, prepared by the experts from the United States of America, which explained the system applied in the United States of America, as well as explanations given by experts on the following subjects:

- (i) History of the Plant Variety Protection System;
- (ii) Procedures for Processing Plant Variety Applications;
- (iii) Data Collection and Storage;
- (iv) Information Resources of the Plant Variety Protection Office;
- (v) Examples of a Search for Novelty.

Summaries of these explanations will be annexed to document TWA/20/9.

91. Examination of Maize Varieties in France. The TWA noted document TWA/20/6 prepared by the experts from France on the system with respect to maize. Under this system the applicant was asked to supply the results of one year's test and the Plant Variety Protection Office carried out another year's test, comparing its own data with those supplied by the applicant. Mr. Guiard (France) explained that the system's aim was to obtain from the breeder a predescription of the variety that allowed the Office to take a decision on the variety after only one year of official tests in two different locations. The decision on the variety would be based on the data from the official test alone. At the outcome of one year's experience, the system looked very promising. It was, however, restricted to maize lines only and extension to other species was not planned at present.

92. Examination in New Zealand. The TWA noted a report from the expert from New Zealand on the change in his country from a government growing test system to a breeders' growing test system with respect to agricultural and vegetable species. The expert concluded that the change had not been an easy one as in the beginning breeders had not been able to describe varieties so that procedures, test guidelines and training courses had had to be prepared to make the system work but now, three years after the change, it was working satisfactorily. One other difficulty had been the non-existence of any descriptions of the varieties of common knowledge. For rye-grass, the Office had had to go back to official growing tests. Thus, in general, New Zealand had a mixed system comprising both official growing tests and breeders' growing tests.

93. Examination in Canada. The TWA also noted a report from the expert from Canada on Canada's intention to build up a system of breeders' growing tests comparable to that already applicable in Australia, where the examiner would look at the plants at the premises of the breeder. As the system would be completely new in Canada, one difficulty would be the setting up of a test of varieties of common knowledge and the selection of similar varieties with which a candidate variety would have to be compared.

94. In the discussions that followed the above-mentioned reports, the TWA noted that the member States at present applying solely a government growing test system would also have to consider partial acceptance of a breeders' growing test system, especially in view of the planned opening of the protection system to the whole plant kingdom. The higher cost of testing and the covering of cost increasingly demanded by governments would also lead to greater involvement of the breeder in the testing. Among the different examples noted, there was, however, a large range of different possibilities for breeders' growing tests, ranging from cases where the breeder received detailed instructions on how to execute the tests and establish the test report and the variety description to very liberal cases leaving details of how to execute tests and establish the description entirely to the responsibility of the breeder.

95. Having noted the results of the discussion on cooperation with breeders in the testing of varieties held within the Technical Committee and other Technical Working Parties, the TWF discussed the possibilities for the species in its field of competence. It finally concluded that it was important for offices not to align themselves with specific breeders in order to remain independent. The possibilities of cooperation depended on the species. For many species it was dangerous to leave testing to the breeders, and only official growing tests would be acceptable. For certain other species, the breeder or applicant could be contacted for details or additional knowledge on the species concerned or for the indication of comparable varieties. In its field of competence, the TWF did not expect many applications for varieties of new species as a result of the extension of protection to the whole plant kingdom. Growing tests done by breeders would not necessarily be cheaper for breeders.

96. The TWO noted paragraph 47 of document TC/26/5 on the last session of the Technical Committee and a short report on the discussions held in the Technical Working Party for Agricultural Crops on cooperation with breeders in the testing of varieties practiced in the United States of America, New Zealand and France and the plans in this respect in Canada. The experts then shortly reported on cooperation with breeders in their respective countries. In Japan national breeding institutes accepted test data of two years of published data

for the decision of distinctness; in other cases, an on-site inspection was made once a year, with the rest of the data being supplied by the applicant, in yet other cases, tests were laid out in governmental stations. In all other States represented during the TWO session, growing tests were mainly done in government trials and only exceptionally on the premises of the breeder/applicant or in other collections of varieties. The observations of the plants were in almost all cases made by government offices, however.

97. The TWO considered that at present there was no need for involving the applicant/breeder in the observations. Most breeders/applicants would be unable to perform the observations and the reliability and the high standards of the test results would suffer. Breeders tests, compared to the present situation, would in all likelihood lead to higher costs for the total testing. In the case of a further increase in the workload, a centralization of the testing should be aimed at before involving the applicant/breeder. Only if that were not enough, should the possibility of involving applicants/breeders be considered species by species and with extreme caution.

98. The TWV noted document TWA/20/6, which explained a system at present under study in France, whereby for maize inbred lines the applicant and the national office did one year of DUS testing each. If the results of both series of tests agreed, the decision to grant variety protection could be made on the basis of the official test results of one year in two locations. The breeder thus saved one year. The Working Party agreed to follow that study.

(see TWA/20/9 Prov., paragraphs 16 to 20, TWF/22/4 Prov., paragraph 12, TWO/24/12 Prov., paragraphs 32 to 34, TWV/24/10 Prov., paragraph 14)

99. The Committee is invited to note the above information and to consider possible steps to be taken.

Minimum Distances Between Varieties

100. The TWA had some difficulty in understanding documents TWC/VIII/9 Rev. and TWC/VIII/14, particularly with regard to the separation between minimum distance and LSD, as well as apparently discrepant statements in the documents in respect of cases in which the minimum distance was smaller than the unit of measurement.

101. The TWC noted documents TWC/VIII/9 Rev. and TWC/VIII/14, on minimum distances and LSD, and the difficulties that the TWA had had in understanding their contents, in particular the different meaning of minimum distance between varieties and the minimum difference between characteristics. It was noted that in the past experts had often used the wrong terms when referring to certain differences. In future, the use of the exact terminology should be ensured, and experts from the TWC should attend sessions of other Technical Working Parties in their countries to explain the meanings of the various terms to the crop experts. It was agreed that it was up to the crop expert to fix the minimum distance, and that he would do so normally in his decision on the layout of the test and the choice of interpretation of the results. There was no link between the recording unit and the LSD, and it should therefore play no role in the definition of the minimum difference in a given characteristic. The TWC agreed to prepare a description of the various terms, including their interrelationship and how they were used in decisions on distinctness, for better understanding on the part of the crop experts.

102. The TWV noted document TWC/VIII/9 Rev. It further noted that the TWC had asked for the document to be studied by the Technical Working Parties and for any comments on it to be presented to that Working Party. The TWV also took note of document TWC/VIII/14, which explained the relation between least significant difference and minimum distance. It noted that the documents required more statistical work to be done, which, because of the few measured characteristics, had not been justified for vegetable species.

(see TWA/20/9 Prov., paragraph 15, TWC/9/12 Prov., paragraph 35, TWV/24/10 Prov., paragraphs 12 and 13)

103. The Committee is invited to note the above information and to consider possible steps to be taken.

Definition and Testing of Hybrid Variety

104. The TWA noted the system of testing of maize hybrids in France where, in the first instance, the lines and the formula of the hybrid were studied. The lines would be checked by automatic comparison by computer. If one line in the formula was different, it could be assumed that the hybrid variety would also be different. If two lines were too close, the hybrid varieties would be compared with each other. With this procedure, 90% of the hybrid varieties could be distinguished on the basis of their lines. The experts from France considered that the large number of 300 to 400 applications of hybrid varieties did not leave the office any other choice. The experts from Germany and Spain reported that, in contrast to France, in their countries the decision on distinctness was based on the comparison of the hybrid varieties themselves. There was indeed a large probability that, in the case of a difference in the lines, the hybrid variety would also be different, but exceptions were also possible and so far they had not wished to take that risk since for them it was too high. The risk, however, might be smaller in electrophoretic characteristics.

105. Classification of Characteristics for Maize. The TWA noted the system of classification of characteristics of maize applied in France. The experts from France would prepare a paper on that classification, including a definition of hybrid variety, and distribute it before the next session of the Technical Committee so that advice could be obtained from the Technical Committee. The basic principle of that classification was that the characteristics were separated into three groups depending on their genetic determination and reliability, and were then given different weights for the determination of distinctness. Group 1 consisted of polygenetic characteristics (e.g. earliness, height of plant, attitude of panicle) which were very useful and not difficult to assess. This was the most important group and a clear difference in one characteristic was enough to establish distinctness. Group 2 consisted of monogenetic characteristics (e.g. color of silk, color of cob) in which differences could be seen easily but which were due to only one gene. For distinctness purposes, a clear difference in at least two of these characteristics was required. Group 3 consisted of other characteristics which were difficult to assess with precision or which showed large fluctuations. A clear difference in three of these characteristics was needed to establish distinctness.

106. Letter from the Maize Section of ASSINSEL. The TWA also noted a letter dated May 15, 1991, from ASSINSEL containing comments from the Maize Section of ASSINSEL on minimum distances and hierarchical determination of characteristics. In view of the above agreed procedure, it was too early to enter into detail regarding those comments which will, however, be considered by the Subgroup on Maize.

107. Subgroup on Maize. The TWA agreed to set up a Subgroup on Maize which would meet at La Minière, France, from February 18 to 20, 1992. Government experts and breeders should be invited to the meeting in order to ensure good discussions and useful results. The bases for discussion during the meeting should be documents TWA/20/6 and TWA/20/8, the methods for electrophoresis on maize prepared by experts from France, the list of deleted and newly-included characteristics and the comments received thereon, and the comments of the Maize Section of ASSINSEL.

(see TWA/20/9 Prov., paragraphs 37 to 40)

108. The Committee is invited to note the above information.

[Annex II follows]

ANNEX II

QUESTIONNAIRE ON THE USEFULNESS OF A CENTRAL COMPUTERIZED DATA BASE OF UPOV
(as distributed to the members of the TWO under cover of circular U 1741)

1. Please state whether you would use such a facility

- 1. to access information Yes/No
- 2. to supply information Yes/No

2. Please state precisely what information you would find useful:-

Species (please list)

.....

Administrative information

.....

Technical information

.....

3. Quantify how you would use the information to make cost savings:

Time savings per annum (rough costs) per species

.....

Elimination of retests caused by inadequate information

.....

Elimination of unnecessary parallel test

.....

Any other cost saving? Please specify

.....

4. If such a system were to be provided, please state your preference:-

Tick one box

- a) central computer system in Geneva
- b) dispersed computer system with different countries holding different species
- c) central computer system in one Member State

At present some countries send and receive information about varieties on floppy disk. Please state if you already participate in such a scheme - and give details

Yes	No
-----	----

Details (if yes)

5. Please give rough estimates of the following costs:-

5.1 Development of appropriate software (this may be an adaptation of an existing system).

.....

5.2 Entry of back data (assuming that, at least 50% will be sent in electronic format).

.....

Annual maintenance charge for upkeep of database and maintenance of software.

.....

5.4 Cost of computer with appropriate links to international networks.

.....

6. Are there any other benefits of a central computerised system which have not been mentioned already? Please specify.

.....