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UPOV

TWC/IV/13
ORIGINAL: English
DATE: June 12, 1987

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Fourth Session
Hanover, Federal Republic of Germany, May 21 to 23, 1986

REPORT

adopted by the Technical Working Party on Automation and Computer Programs

Opening of the Session

1. The fourth session of the Technical Working Party on Automation and Computer Programs (hereinafter referred to as "the Working Party") was held in Hanover, Federal Republic of Germany, from May 21 to 23, 1986. The list of participants is reproduced in Annex I to this report.

2. Dr. D. Böringer, President of the Bundessortenamt at Hanover, welcomed participants to the Office. The session was opened by Mrs. V. Silvey (United Kingdom), Chairman of the Working Party.

Adoption of the Agenda

3. The Working Party adopted the agenda for its fourth session, which is reproduced as document TWC/IV/1.

Report on Subjects of Special Interest to the Working Party Raised During the Twenty-first Session of the Technical Committee and on Questions Raised by Other Technical Working Parties

4. Dr. M.-H. Thiele-Wittig reported on the main subjects of interest to the Working Party raised during the last session of the Technical Committee, referring to the full report on that session reproduced in document TC/XXI/7 for further information.

5. He also referred to document TWV/XIX/24 on statistical methods used at present to compare data on vegetable varieties, which was the result of a technical questionnaire prepared by experts from the United Kingdom and distributed to members of the Technical Working Party for Vegetables. The Working Party agreed to await the outcome of the discussions in the Technical Working Party for Vegetables before going into further detail concerning the above-mentioned document.

Over-Years-Analysis

6. Discussions were based on document TC/XX/5 and on the results of a study made with the COY program and reproduced in documents TWC/IV/5, TWC/IV/6, TWC/IV/7 and TWC/IV/8.

7. The Chairman reminded the Working Party that paragraph 6 of document TWC/III/13 had identified the following practical problems for study and solution before adopting the COY analysis:

(i) the present differences between countries in estimating the standard error based on the analysis of variance of single plants or plots,

(ii) the need to keep the continuity of distinctness decisions when introducing the COY analysis, and

(iii) the need to maintain the present possibility of deciding on distinctness after two years of tests.

8. The Technical Committee had called for final discussions on the application of the COY analysis at its recent session. Experts from five member States had in recent years applied the COY analysis to sets of data using a computer program supplied by Dr. Weatherup (United Kingdom). The results of that application of the COY analysis and comments thereon were presented in the above-mentioned documents.

9. Dr. Weatherup summarized the outcome by indicating that the differences shown resulted partly from the fact that:

(i) some member States used the variation between plants rather than plots,

(ii) in some member States, the high variety x year interaction resulted in rather high values of λ.

Dr. Weatherup estimated that the 2x1% test based on plant variation is approximately equivalent to a 2x10% test based on plot variation. To ensure continuity with the previous decision, taking standards based on plant variation, member States might at the beginning have to use a COY criterion of 10%, gradually tightening up the standard over the years.

10. During the subsequent discussions, the Working Party agreed that the plot variation was statistically the correct and valid basis for the present UPOV tests on distinctness (2x1%, t-score).

11. Measures to control and reduce the variety x year interaction should be applied whenever possible. These included the grouping of varieties according to major characteristics associated with high λ -values, e.g. maturity date. Dr. Laidig (Federal Republic of Germany) proposed the application of the "Modified Joint Regression Analysis (M.J.R.A.) for incomplete variety x environment data" as reported by P. Digby, in the "Journal of Agricultural Sciences 93," Cambridge, 1979, pages 81 to 86. The Working Party agreed that this technique was an appropriate one to use.

12. The Working Party concurred that it was necessary to maintain some continuity with the past decision level. It therefore agreed that, for an initial period of three years, there should be some flexibility in the probability levels which member States used when taking distinctness decisions. A 5% level should, in general, be achieved for three years data. Mr. Hutin (France) proposed to base the decision on significant variety differences of more than one characteristic. The Working Party noted that the procedure affects the probability of wrongly accepting a variety as distinct. The over-all probability level depends upon the number of characteristics included and the degree of mutual correlation. That procedure would alter the COY analysis of using only one characteristic considerably.

13. Mr. Baltjes (Netherlands) proposed that distinctness decisions using the COY analysis should take account of the specific variety x year effect for varieties under consideration. Where the variety difference was significant at the probability level α and the specific varieties x years interaction, as measured by the ratio F_3, was significant at the same probability level, Mr. Baltjes considered that the evidence for distinctness was not sufficient (see TWC/IV/7).

14. The Working Party agreed that the calculations of F_3 and associated probabilities should be clearly presented in the computer output from the COY analysis. Dr. Weatherup (United Kingdom) agreed to amend the output as necessary and to provide a user description of the way to use and interpret the COY results. The Working Party agreed that this program and documentation should be supplied to all member States and used by them to provide statistics for later use by agronomists taking decisions on distinctness.

15. The Working Party recommended to the Technical Committee that for grass species, where experience had already been accumulated, the COY analysis should be used to assess distinctness and the test results would be presented in the form shown in Annex IV to this report. The Working Party recognized that high varieties x years interaction can make distinctness more difficult to achieve when using the COY analysis rather than the present UPOV distinctness criteria (2x1%, t-score). The Working Party suggested that variety differences should, in general, achieve at least the 5% level of significance for distinctness in a minimum of one characteristic.

16. The Working Party also suggested to the Technical Committee that, for a three-year initial period, member States should use the COY analysis and consider whether or not it was appropriate to require that differences between varieties should achieve the 1% level of significance in order to be accepted as distinct. During the next three years, experience in applying the COY analysis to grass species and other cross-fertilized species will indicate how best to refine the technique in order to specify more precisely the UPOV distinctness criterion based on the COY analysis, for subsequent use.

Testing of Homogeneity in Cross-Fertilized Plants

17. During the third session of the Working Party, a new criterion for the testing of homogeneity in cross-fertilized plants had been introduced (see document TWC/III/10). The program described in that document had in the meantime been distributed to experts from several member States for study. The results of this study are reproduced in document TWC/IV/10 and were explained by Mr. Talbot (United Kingdom). In addition, Dr. Fuchs and Dr. Laidig (Federal Republic of Germany) introduced several tables with further data.

18. As a result of the discussion on the above information, it was agreed to rediscuss the subject during the next session of the Working Party on the basis of the results of an amended version of the program which included the possibility of taking decisions after two years of testing. The new version of the program would be circulated by Mr. Talbot (United Kingdom) at the beginning of July 1986. Results are to be sent to Mr. Talbot before February 1987 and a summary will be circulated to the Working Party in April 1987. The Working Party expressed the hope that more member States than in the past would be able to apply the program and send their results for comparison. Attention was also drawn to the need to check the probability level required to approximate the results obtained using the present UPOV criteria for homogeneity.

Testing of Homogeneity in Self-Fertilized Plants

19. Dr. Weatherup (United Kingdom) introduced the summary of the results of the questionnaire on the testing of homogeneity in self-fertilized plants reproduced in document TWC/IV/9, as well as two updated tables distributed during the current session of the meeting. He noted corrections to the tables and prepared further updated tables which are reproduced in Annex II to this report.

20. The Working Party noted that although a large part of the harmonization had already been achieved and member States were abiding by the decisions reproduced in the General Introduction to Test Guidelines (document TG/1/2), there were nevertheless differences caused by the various sample sizes used and the different maximal number of off-types accepted, which affected the probability of acceptance of lots with different numbers of off-types.

21. The Working Party would therefore invite the Technical Committee to discuss the need for further harmonization, bearing in mind in particular the possibility of calculating nominal standards for the incidence of off-types. A short note prepared by the chairman in collaboration with Mrs. Campbell for presentation to the Technical Committee is reproduced in Annex III to this report.

Annual List of Varieties Under Test

22. Mr. Duyvendak (Netherlands) said that he had not yet received the 1986 versions of the annual list of varieties under test, therefore there was nothing new to report. The Working Party noted that the list from France also contained decisions on varieties which had been included in the previous year's list. This information was considered to be very helpful and other member States were asked to study the possibility of including similar information in their lists.

23. Mr. Bar-Tel (Israel) wanted easier cross referencing of varieties in the various issues of the gazettes of one and the same member State and also of those of other member States. Before November 1986, he will prepare a summary of the difficulties encountered for distribution to members of the Working Party.

Description of Varieties

24. Discussions were based on documents TWC/IV/12, TWC/III/13, Annex III and TC/XX/6, Annex II.

25. Mr. Law (United Kingdom) introduced document TWC/IV/12 containing a summary of the results of a questionnaire on the description of varieties which had been distributed during the current session of the Working Party.

26. From the answers given in writing or during the session, it appeared that all experts agreed that the UPOV example varieties should define the 1 to 9 score of the characteristics. In practice, however, member States would make more use of the varieties of their own reference collections.

27. Different practices were used depending on the member State and also on the species with regard to the adjustment of missing data and the conversion of data of measured characteristics into the 1 to 9 scale within each year or only for the over-years means. To obtain a better overview of the present practice, the Working Party agreed that each member State would apply its practice to a given set of data distributed during the present session and would send the results, including a short explanation of the practice to Mr. Law (United Kingdom) before the end of November 1986 so as to prepare a summary before the end of December 1986 for the next session of the Working Party. In member States where different methods of calculation are applied to different species, that member State should apply each of the different methods to the set of test data supplied to the Working Party, and submit explanations of each method and a list of the species for which the methods are used, together with information on whether final descriptions or annual data are used. Before the beginning of July, Mr. Baltjes (Netherlands) would supply additional details (LSD) on the data already distributed.

28. The Working Party noted that in some member States it was not normally possible to change a variety description, while in others amendments or corrections were possible. It was agreed, however, that it was not admissible to modify the description where a variety had changed significantly. In such cases, the variety lost its protection as it no longer conformed to the original description established at the time of granting protection. A non-significant shift was admissible, provided that previous or further shifts did not amount to a significant difference from the original description.

29. The Working Party agreed that fairly comprehensive information on each characteristic observed should be included in an exchange of variety descriptions between member States. Most experts considered that it would not be useful to include all states of expression in the form used for that purpose as it would become too long.

30. Dr. Fuchs (Federal Republic of Germany) introduced document TC/XXI/6, which contained proposals for the revision of the UPOV Model for a Report on Technical Examination. The Working Party also noted paragraphs 43 to 45 of document TC/XXI/7, giving a summary of the discussions held on that subject

during the last session of the Technical Committee. In paragraph 45, the Technical Committee had asked the Technical Working Parties to comment on the draft.

31. Having examined the above-mentioned documents, the Working Party finally agreed to recommend the following to the Technical Committee:

(i) At the top of the table of characteristics, information on the following should be requested:

- species (latin and common name)
- breeder's reference
- variety denomination
- application number
- reference number assigned by the testing authority
- testing authority
- testing place
- period of testing (19.. to 19..)
- date of preparation of the documents
- UPOV Test Guidelines (document no. and date)
- space for national Test Guidelines (date)
- applicant

It would have to be decided whether items that are not fixed (applicant, application number of requesting authority) should be placed on a different sheet or at the very top of the form.

(ii) In the Table of Characteristics of Annex II to document TC/XXI/6, the following should be amended:

- There should be a small column for brief remarks or for a reference to longer remarks to be contained in a footnote.

- National numbers of characteristics should be placed in a separate column and do not need to be specially marked.

- Additional national characteristics should not be placed after the UPOV characteristics, but in the natural sequence, as the main use of the form would still be for national purposes.

- States should not have a box which could simply be marked

- The asterisks from the UPOV Test Guidelines should be repeated in the form.

- The grouping characteristics should also have their characteristic number if it exists.

- Characteristics not observed should not be mentioned.

- Most experts thought that characteristics not applicable should nevertheless be mentioned.

Some experts warned against overloading the form with too much information.

Intercommunication Network

32. The Working Party noted document TWC/IV/11 containing an updated summary of possible computer center communications prepared by Mr. Talbot (United Kingdom). A further updated version of that summary is reproduced in document TWC/IV/11 Rev. Mr. Baltjes (Netherlands) and Mr. Talbot will try to exchange the table of data distributed during the current session via electronic mail. Mr. Talbot will also initiate an electronic exchange of information with other member States and will report on its outcome to the next session of the Working Party.

Exchange of Software

33. Guidelines for Programming. Mr. Talbot (United Kingdom) introduced document TWC/IV/2, which contains guidelines for programming. Under item 4 (Program Structure), the Working Party included a request for a clearly definable input module of the program. The updated version of these guidelines is reproduced in document TWC/IV/2 Rev.

34. Mr. Talbot (United Kingdom) agreed to prepare guidelines for the next session of the Working Party on the production of programs which could be readily assimilated into other plant variety computer systems.

35. Exchangeable Programs used on Mini- or Main-Frame Computers by Member States. Mrs. Campbell (United Kingdom) introduced document TWC/IV/4, which contained a summary of the information received on exchangeable programs used on mini- or main-frame computers by member States, as well as on procedures using the statistical package (SAS) and programs written for microcomputers. The information given on page 4 of that document was completed by stating that the programs "DATASTAR" and "MICROSTAT" were programs which had to be purchased, and the program "SAS-IBEN" was corrected into "SAS-IBAN." On page 2, in addition to Mr. A. van der Burgt, Mr. H. Schuitemaker was mentioned.

36. Survey on Hand-Held Data Capture Devices. Mrs. Campbell introduced document TWC/IV/3 containing updated information on hand-held data capture devices. The information was amended for the HUSKY HUNTER by the indication "microcomputers" in the column "INTERFACE WITH."

Updating of the Summary on Hardware and Software of Currently Used Main-Frame Computers.

37. In connection with the Survey on Hand-Held Data Capture Devices, the Working Party felt the need to update the information on hardware and software of currently used main-frame computers. Mrs. Campbell (United Kingdom) will prepare a questionnaire by the end of July 1986 to be completed by member States by the end of November 1986.

38. Mr. Duyvendak (Netherlands) agreed to contact experts of the individual member States with a view to obtaining and preparing a summary on the basic structure of existing data bases in the UPOV member States before the end of December 1986.

List of Reference Books or Other Documents Useful in Connection with the Testing of Varieties

39. The Working Party noted that the Office of the Union had received no information from experts in the Working Party regarding document TC/XXI/4 containing the draft list of reference books and documents distributed to the Technical Committee during its twenty-first session in November 1985. It was recalled that, during its last session, the Technical Committee had asked the various experts to check the list once again for content and any corrections still to be made or additional information to be added. The Working Party therefore asked all its members to re-check the list and to inform the Office of UPOV of any corrections or additional information before the end of July 1986. It also noted that the Technical Committee had decided to update the list annually. The Working Party consequently asked its members to indicate to the Office of the Union any new information which they might consider it worthwhile to include in the list.

Chairmanship

40. The Working Party noted that the three-year chairmanship of Mrs. Silvey would end with the closing of this year's ordinary session of the Council. The terms of office of the chairmen of all the other Technical Working Parties would end in 1987. The Working Party was very satisfied with the present chairmanship and proposed to the Technical Committee that it should recommend that Council should appoint Mrs. Silvey as chairman for one more year.

Future Program, Date and Place of Next Session

41. The Working Party agreed to hold its fifth session at Copenhagen, Denmark, from June 10 to 12, 1987. The meeting would start at 9 a.m. on June 10 and close at 1 p.m. on June 12, 1987. During its session, the Working Party would continue discussion or start new discussion on the following items:

(i) Report on subjects of special interest to the Working Party raised during the twenty-second session of the Technical Committee and on questions raised by other Technical Working Parties.
(Discussions will depend on the results of those to be held in the Technical Working Party for Vegetables.)

(ii) Over-years-analyis (COY).
((a) Before the end of July 1986, Dr. Weatherup (GB) will prepare an amended version of document TC/XX/5 for presentation to the Technical Committee, together with the recommendation mentioned in paragraphs 15 and 16 of this report. The results of the discussions in the Technical Committee will be reported to the Working Party.

(b) Experts from member States will report to the Working Party on their experience with the application of the COY analysis, especially with regard to cross-fertilized species other than grasses.)

(iii) Testing of homogeneity in cross-fertilized plants.
(By the beginning of July 1986, Mr. Talbot will prepare a new version of the program for circulation. Comments must be sent back to him by the beginning of February 1987, for the preparation of a summary before April 1987.)

(iv) Testing of homogeneity in self-fertilized plants.
(The result of the discussion in the Technical Committee on the updated tables and drawings, together with the short note reproduced in Annex III to this draft report, will be discussed).

(v) Logical order of states of expression in Test Guidelines (Dr. Laidig (DE) will prepare a document before the end of January 1987).

(vi) Description of varieties.
((a) Before the beginning of July 1986, Mr. Baltjes will supply additional details (LSD) to the data distributed. Member States will send their practices applied to the distributed data to Mr. Law (GB) before the end of November 1986 for the preparation of a summary by him by the end of December 1986.

(b) Before the end of September 1986, Mr. Duyvendak (NL) will prepare a program for the translation of numerical notes into words and distribute the tape to the States present during the session.

(c) The results of the discussions in the Technical Committee on the revision of the UPOV model for a report on technical examinations will be discussed.)

(vii) Harmonization of Gazette Entries.
(Before November 1986, Mr. Bar-Tel (IL) will prepare a summary of the difficulties encountered when checking cross references of varieties in the different national gazettes).

(viii) Progress report on electronic information exchange.
(Mr. Law (GB) will inititate the exchange and report on its outcome).

(ix) Updated summary on hardware and software for currently used main-frame computers.
(The updating of the information will be prepared by Mrs. Campbell (GB) through a questionnaire to be prepared by the end of July 1986 with answers to be sent to her by the end of November 1986).

(x) Report on the structure of existing data bases.
(Mr. Duyvendak (NL) will prepare a summary before the end of December 1986).

(xi) Guidelines for the production of programs which can be readily assimilated into other Plant Variety Computer Systems.
(Mr. Talbot will prepare guidelines before the end of the year)

(xii) Reference books and documents
(The experts will supply the Office of the Union with further updated information on the list of reference books and documents).

Visits and Demonstrations

42. In the afternoon of the first day of the session, the Working Party visited the facilities of the headquarters of the Bundessortenamt, including its computer center. In the afternoon of the second day, it was given an explanation and practical demonstration of the operation of the computer system and visited the Testing Station at Scharnhorst.

43. This report was unanimously adopted by the Working Party at its fifth session on June 10, 1987.

[Four annexes follow]

ANNEX I

LIST OF PARTICIPANTS AT THE FOURTH SESSION OF THE TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS, HANOVER, FEDERAL REPUBLIC OF GERMANY, MAY 21 TO 23, 1986

I. MEMBER STATES

DENMARK

Mr. K. KRISTENSEN, Dataanalytisk Laboratorium, Lottenborgvej 24, 2800 Lyngby (tel. 02 870631)

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UNITED KINGDOM

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Mr. J.R. LAW, National Institute of Agricultural Botany, Huntingdon Road, Cambridge CB3 0LE (tel. 0223 276381)

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Mr. M. TALBOT, Agricultural and Food Research Council (AFRC), Unit of Statistics, University of Edinburgh, The Kings Buildings, Mayfield Road, Edinburgh EH9 3JZ (tel. 031 667 1081)

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II. OFFICER

Mrs. V. SILVEY, Chairman

III. OFFICE OF UPOV

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[Annex II follows]

TWC/IV/13

ANNEX II

Summary of replies to questionnaire regarding uniformity standards for vegetatively propagated and truly self-fertilizing varieties in member states

Replies were received from Federal Republic of Germany, France, Netherlands, Spain, Denmark, Republic of Ireland and the United Kingdom. These are summarised with respect to ear row evaluation and single plant evaluation in Tables 1 and 2 respectively.

With regard to ear row testing the acceptance probabilities for the sampling schemes used in different states are provided in Table 3 and given graphically in Fig. 1. This shows some differences in the standard being applied in these countries.

Also individual plants are used differently. In some cases a maximum number of off-types is specified and in other cases the results from individual plants are only used to draw attention to possible difficulties which are then examined in more detail in the ear rows. Table 4 provides acceptance probabilities for individual plant sampling schemes where they have been specified and Fig. 2 shows these probabilities graphically. It can be seen that these represent a much stricter standard than for rows with a very low probability of accepting more than 0.5% off types.

S T C Weatherup
Department of Agriculture for N. Ireland

2 September 1986

Table 1: Sampling schemes for cereal uniformity testing in operation in member states

SAMPLE UNITS : ROWS

Crop: Spring Barley

Member state	Germany	France	Ireland	UK			Spain	Denmark		Netherlands
				Year 1	Year 2	Total		Year 1	Year 2	
Sample size	100	100	135	150	150	300	100*	100	100	100
Maximum number of off-types	3	3	3	4	4	6	3	3	3	3
Nominal standard	-	-	-		2%		2%	-	-	-
Actual number of off-types recorded	-	2%	-		2.5%		1%	-	-	-

Crop: Spring Oats

Sample size	100	100	135	150	150	300	100*	100	100	100
Maximum number of off-types	3	3	3	4	4	6	3	3	3	3
Nominal standard	-	-	-		2%		2%	-	-	-
Actual number of off-types recorded	-	5%	-		2.1%		1%	-	-	-

Crop: Wheat

Sample size	100	100	135	150	150	300	100*	100	100	100
Maximum number of off-types	3	3	3	4	4	6	3	3	3	3
Nominal standard	-	-	-		2%		2%	-	-	-
Actual number of off-types recorded	-	5%	-		2%		1%	-	-	-

* Standard must be attained in 2 years out of 3. Variety rejected if ≥10 off-types in any year.

Table 2: Sampling schemes for cereal uniformity testing in operation in member states

SAMPLE UNITS : PLANTS

Crop: Spring Barley

Member state	Germany			France			Ireland		UK		Spain	Netherlands
	Year 1	Year 2	Year 3	Year 1		Year 2	Year 1	Year 2	Year 1	Year 2		
				Seed lot	VCU	VCU						
Sample size	3000	2000	2000	2000	1000	1000	2000	2000	5000	5000	2000*	2000
Maximum number of off-types	7	5	5	-	-	-	5	5	-	-	5	5
Nominal standard	-	-	-	2.5%	6%	4%	-	-	2%		2%	-
Actual number of off-types recorded	-	-	-	5%	1%	1%	-	-	-		0.2%	-

Crop: Spring Oats

Member state	Germany			France			Ireland		UK		Spain	Netherlands
	Year 1	Year 2	Year 3	Year 1		Year 2	Year 1	Year 2	Year 1	Year 2		
				Seed lot	VCU	VCU						
Sample size	3000	2000	2000	2000	1000	1000	2000	2000	5000	5000	2000	2000
Maximum number of off-types	7	5	5	-	-	-	5	5	-	-	5	5
Nominal standard	-	-	-	2.5%	6%	4%	-	-	2%		-	-
Actual number of off-types recorded	-	-	-	10%	1%	1%	-	-	-		-	-

Crop: Wheat

Member state	Germany			France			Ireland		UK		Spain	Netherlands
	Year 1	Year 2	Year 3	Year 1		Year 2	Year 1	Year 2	Year 1	Year 2		
				Seed lot	VCU	VCU						
Sample size	3000	2000	2000	2000	1000	1000	2000	2000	5000	5000	2000	2000
Maximum number of off-types	7	5	5	-	-	-	5	5	-	-	5	5
Nominal standard	-	-	-	2.5%	6%	4%	-	-	2%		-	-
Actual number of off-types recorded	-	-	-	10%	3%	3%	-	-	-		-	-

* Standard must be attained in 2 years out of 3. Variety rejected if >10 off-type plants in any year.

Table 3: Acceptance probabilities for sampling schemes in use in Member states for cereal uniformity testing

	Sample Unit : Rows					
Scheme	1	2	3	4		
				Year 1	Year 2	Total
Sample size	100	130	135	150	150	300
Maximum no of off-types	3	3	3	4	4	6
% Variants						
0.5	0.998	0.996	0.995		0.998	
1.0	0.982	0.958	0.953		0.950	
1.5	0.936	0.867	0.854		0.795	
2.0	0.859	0.737	0.715		0.562	
2.5	0.759	0.591	0.563		0.340	
3.0	0.647	0.451	0.421		0.180	
3.5	0.535	0.329	0.301		0.085	
4.0	0.430	0.232	0.208		0.037	
4.5	0.337	0.159	0.139		0.015	
5.0	0.258	0.106	0.090		0.006	
5.5	0.194	0.069	0.057		0.002	
6.0	0.143	0.044	0.036		0.001	
7.0	0.074	0.017	0.013		0.000	
8.0	0.037	0.006	0.005		0.000	

Table 4: Acceptance probabilities for sampling schemes in use in member states for cereal uniformity testing

Sample Unit - Plants

	State			
% Variants	Netherlands	Germany	Ireland	Spain
0.05	0.999	0.999	0.999	1.000
0.10	0.983	0.956	0.967	0.999
0.15	0.916	0.767	0.839	0.977
0.20	0.785	0.459	0.616	0.866
0.30	0.446	0.064	0.199	0.369
0.40	0.191	0.003	0.037	0.065
0.50	0.067	0.000	0.005	0.006

FIGURE 1

Acceptance sampling curves for various row sampling schemes

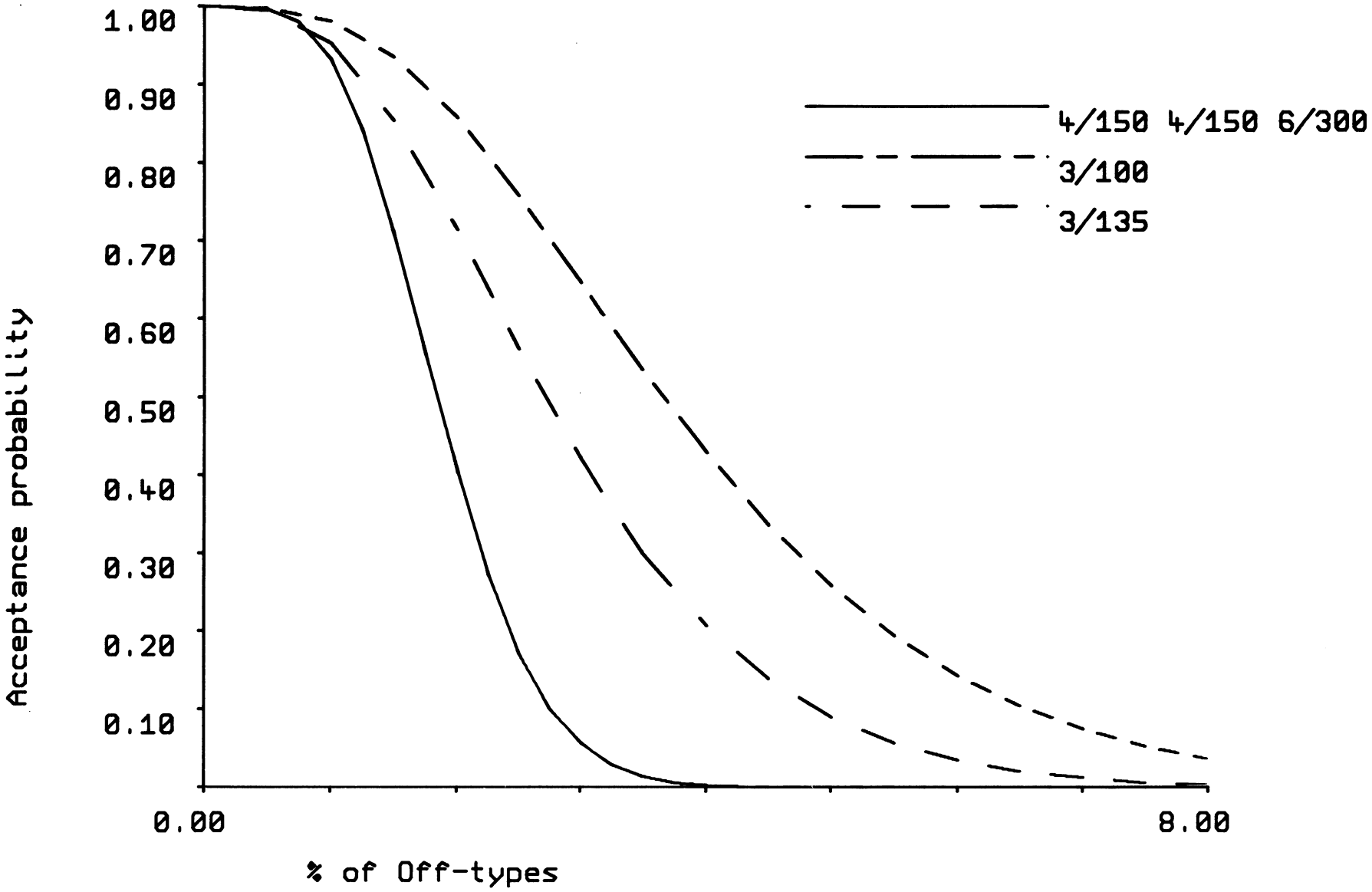
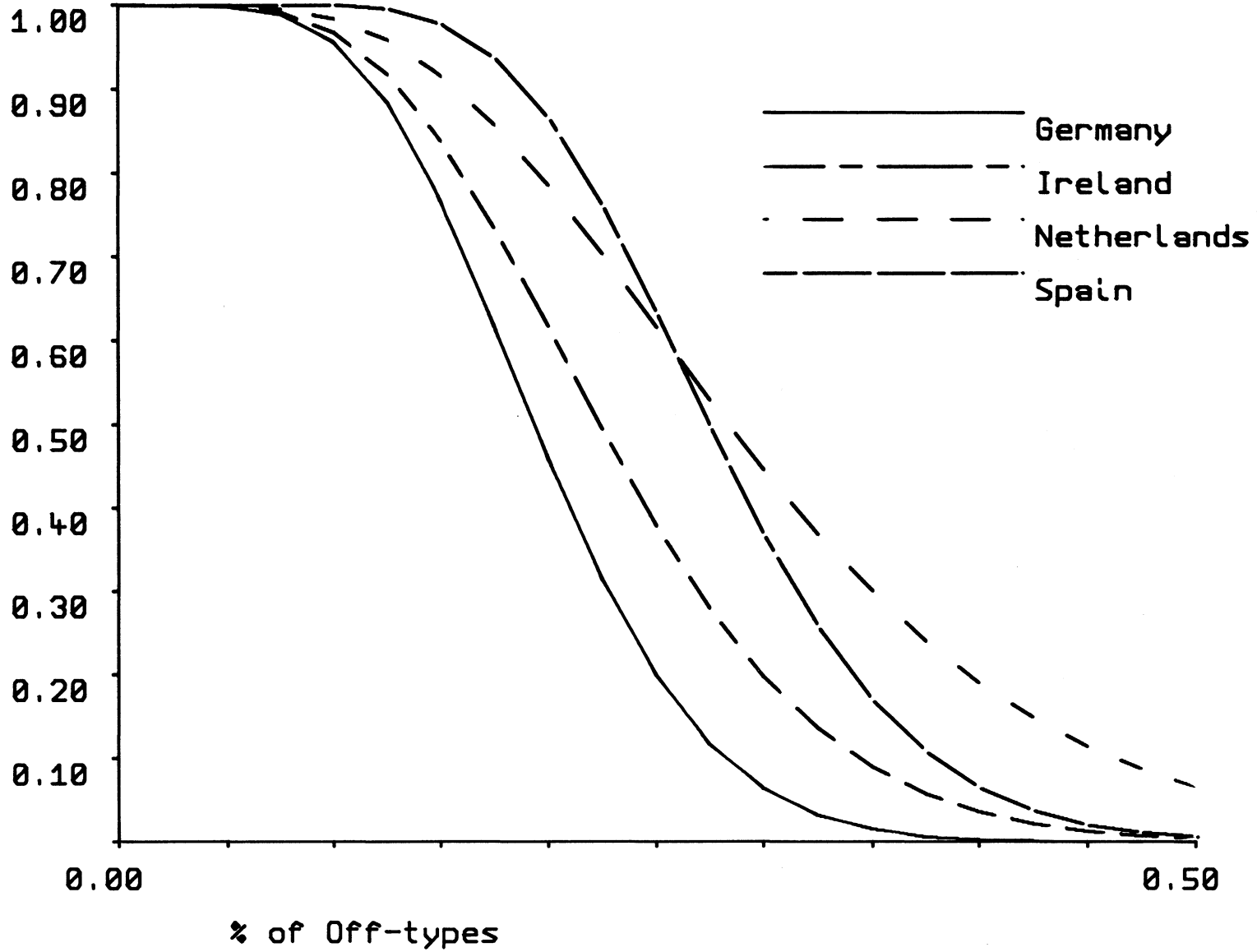


FIGURE 2

Acceptance sampling curves for various plant sampling schemes



[Annex III follows]

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ANNEX III

Standards used in testing homogeneity of self-fertilised plants

1. Working standards for testing homogeneity are described in UPOV document TG/3/8 which states in paragraph 5

'For homogeneity.....3 in 100'

Document TC/XII/6 sets out maximum acceptable numbers of off-types in samples of various sizes.

2. Tables 1 and 2 of Annex II shows that the most commonly used standards in the 7 countries listed are 3 off-types in 100 ear-rows and 5 off-types in 2000 plants.

3. In reporting current practice some countries also quoted a 'nominal standard' which seemed to be close to, or less than, the maximum permitted percentage of off-types. There are different interpretations of 'nominal standard' and some discussion is needed to clarify this.

The statistician usually defines a nominal standard as that percentage of off-types in the population (of ears or plants) which would result in a 50% probability of samples being accepted under a given sampling scheme.

As the graphs presented in Annex II show, the sampling schemes used in different countries have different nominal standards corresponding to the 50% (P = 0.50) acceptance probability. This also implies that the sampling schemes differ in the risks they carry of making wrong decisions - that is risks of wrongly accepting non-homogeneous lots or of rejecting sufficiently homogeneous lots.

The statisticians suggest that the schemes in use should be examined and the nominal standards and associated risks of wrong decisions should be defined.

oOo

[Annex IV follows]

ANNEX IV

USE OF F_3 STATISTIC WITH THE COY CRITERION

The F_3 statistic for a particular variety pair on a specified character is defined as:

$$\frac{\text{varieties x years mean square specific to the variety pair}}{\text{varieties x years mean square for all varieties}}$$

The Technical Working Party considered that this statistic was useful in identifying variety pairs which although distinct using the COY criterion show sufficient inconsistencies over years compared with other varieties of the same species to indicate that their apparent distinctness may not be reproducible in later years. Attached is a copy of the TVAL output modified to include a significance test for F_3. Critical values for F_3 are obtained from the F table with (NY-1) and (NY-1) (NV-1) degrees of freedom where NY and NV are the numbers of years and varieties respectively. The Working Party agreed that a significant COY result with a non significant F_3 value could be accepted as evidence of distinctness without further investigation. However it considered that a variety pair having a significant COY result and also a significant F_3 value could not be immediately accepted as distinct due to the possibility that the COY result may not be reproducible. The Working Party agreed that such a result should be examined in more detail before accepting the pair as distinct. Such an examination might take into account the actual

significance levels of the COY test and the F_3 value. Thus a just significant F_3 value might be neglected if it occurred in conjunction with a highly significant COY result. The critical levels for significance of F_3 and the COY criterion will be subject of consideration by the Working Group over the next 3 years. As an example using the comparison of variety A v variety B from the attached output, this pair may be declared distinct on character 10 HGTATEE (COY $P<0.1\%$, F_3 $P<5\%$) but not on character 14 FLAGLGTH (COY $P<0.1\%$, F_3 $P<0.1\%$) due to the very large variation in the within year differences, given by t values, in the case of the latter character.

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5 September 1986

PRG(DIP) LATES 1982,1983 , 1984

COMPARISONS BETWEEN 42 VAR A AND 33 VAR B
T VALUES POSITIVE IF VAR A LARGER THAN VAR B

		SIGNIFICANCE LEVELS YEARS				COMBINED ANALYSIS			T VALUES YEARS			T SCORE	F3	
		82	83	84		T	PROB	SIG	82	83	84			
4	ANGLEYOS	+	+1	-	ND	1.32	18.880	NS	0.89	2.97	-0.95	2.97	2.00	NS
5	SPRNGHT	-	+5	-1	ND	-1.36	-17.744	NS	-0.44	2.28	-6.42	-1.09	5.39	**
8	DATEOFEE	-1	-1	-1	D	-6.83	0.000	***	-4.02	-6.26	-6.17	-10.11	1.04	NS
10	HGTATEE	-1	-1	-1	D	-7.24	0.000	***	-3.96	-4.20	-7.71	-10.11	3.78	*
11	WDTHATEE	-	-	-5	ND	-1.76	-8.140	NS	-1.06	-1.00	-2.14	-2.14	0.15	NS
14	FLAGLGTH	-1	-	-1	D	-6.56	0.000	***	-5.30	-1.78	-11.04	-6.74	9.27	***
15	FLAGWDTH	-1	-1	-1	D	-8.34	0.000	***	-8.98	-3.24	-7.73	-9.98	5.13	**
17	SLTEEE30	-1	-1	-1	D	-8.69	0.000	***	-9.28	-3.59	-7.43	-10.11	2.69	NS
19	HEAD/PLT	+	+5	+	ND	1.63	10.599	NS	0.32	2.33	0.00	2.33	1.73	NS
20	HGT AFT	-1	-	-1	D	-4.58	-0.001	***	-4.65	-0.30	-5.44	-6.74	4.95	**
24	EARLGTH	-1	-1	-1	D	-9.75	0.000	***	-10.30	-3.57	-10.25	-10.11	5.07	**
31	SP/SPK	+2	+2	-	D	2.11	3.731	*	2.53	2.38	-0.69	4.91	2.37	NS
32	FLT/SPK	-	+2	-5	ND	-0.92	-35.786	NS	-1.80	2.48	-2.13	0.36	3.49	*
34	GLUMELGT	-1	-1	-1	D	-7.67	0.000	***	-6.68	-5.34	-4.28	-10.11	0.48	NS
35	SPK-AWN	-1	-	-1	D	-5.64	0.000	***	-5.33	-1.12	-5.35	-6.74	4.84	*

COMPARISONS BETWEEN 42 VAR A AND 34 VAR C
T VALUES POSITIVE IF VAR A LARGER THAN VAR C

		SIGNIFICANCE LEVELS YEARS				COMBINED ANALYSIS			T VALUES YEARS			T SCORE	F3	
		82	83	84		T	PROB	SIG	82	83	84			
4	ANGLEYOS	+	+5	-	ND	0.94	34.866	NS	0.13	2.12	-0.06	2.12	0.79	NS
5	SPRNGHT	+	-	-1	ND	-2.18	-3.147	*	0.61	-0.94	-7.10	-3.37	4.54	*
8	DATEOFEE	-1	-1	-1	D	-7.02	0.000	***	-4.57	-6.37	-5.98	-10.11	0.57	NS
10	HGTATEE	-1	-1	-1	D	-6.76	0.000	***	-4.55	-3.95	-6.42	-10.11	1.56	NS
11	WDTHATEE	-1	-	-2	D	-3.35	-0.119	**	-3.48	-1.78	-2.40	-5.77	0.73	NS
14	FLAGLGTH	-1	-1	-1	D	-4.80	-0.001	***	-2.68	-3.59	-6.94	-9.42	2.28	NS
15	FLAGWDTH	-1	-	-1	D	-3.41	-0.097	***	-2.90	-0.41	-4.94	-6.27	2.50	NS
17	SLTEEE30	-1	-1	-1	D	-8.66	0.000	***	-7.96	-4.65	-7.28	-10.11	0.51	NS
19	HEAD/PLT	+	+5	+	ND	2.59	1.124	*	1.72	2.33	0.00	2.33	1.71	NS
20	HGT AFT	-1	-	-1	D	-5.13	0.000	***	-4.64	-1.69	-5.48	-6.74	3.02	NS
24	EARLGTH	-1	-1	-1	D	-7.73	0.000	***	-8.05	-3.68	-7.20	-10.11	1.37	NS
31	SP/SPK	+	+1	+	ND	3.19	0.193	**	1.92	3.67	1.01	3.37	1.25	NS
32	FLT/SPK	+	+1	-	ND	1.58	11.836	NS	0.62	4.69	-0.69	3.37	3.47	*
34	GLUMELGT	-1	-1	-1	D	-7.66	0.000	***	-6.28	-4.53	-5.08	-10.11	1.35	NS
35	SPK-AWN	-1	+	-1	D	-3.23	-0.173	**	-2.86	0.30	-3.94	-6.23	4.11	*

[End of Annex IV and of document]