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UPOV

TWC/V/8
ORIGINAL: English
DATE: November 20, 1987

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Fifth Session
Copenhagen, Denmark, June 10 to 12, 1987

REPORT

adopted by the Technical Working Party on Automation and Computer Programs

Opening of the Session

1. The fifth session of the Technical Working Party on Automation and Computer Programs (hereinafter referred to as "the Working Party") was held in Copenhagen, Denmark, from June 10 to 12, 1987. The list of participants is reproduced in Annex I to this report.

2. Mr. K. Kristensen (Denmark) welcomed participants to the Laboratory for Data Analysis of the Danish Research Service for Plants and Soil Science at Lyngby, Denmark. 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 fifth session, which is reproduced in document TWC/V/1.

Adoption of the Draft Report on the Fourth Session

4. The Working Party adopted the report on its fourth session, reproduced in document TWC/IV/13 Prov., after having agreed to the proposed amendments contained in the Annex to circular U 1158, with the exception of the words "... cannot be stated a priori because it ..." which should be deleted in the first proposal.

Reports 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

5. 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/XXII/7 for further information.

Combined Over-Years (COY) Analysis

6. The Working Party, having noted the decision of the Technical Committee to replace the previous distinctness criteria for varieties of grass species by the combined over-years (COY) analysis, exchanged views to find out how far that decision had already been implemented by the different member States. While in the United Kingdom the COY analysis had been used for sets of two years and three years of results ending 1987 (at 0.1% and 1% levels of significance respectively), in Denmark, the Federal Republic of Germany and the Netherlands, the COY analysis would only be used parallel to the previous UPOV criteria as of 1987. In France, it may be used parallel to the previous UPOV criteria as of 1988. In the Netherlands, the COY analysis had already been used for some 1986 data on red fescue varieties. It appeared that there was no need to make corrections for high F_3 values in these calculations, but this may change from species to species. In Spain and Israel, there are no tests of grass species varieties taking place. Experts in these countries would however study the possibility of applying the COY analysis to other species, for example, lucerne or chick pea. In Denmark, a study to apply the analysis to beet varieties has already been started.

7. The Working Party noted that, whenever possible, UPOV criteria should be used for the exchange of test results from one member State to another. If criteria in two States differed, bilateral agreements on the exchange of test results would, as in the past, regulate at the bilateral level which criteria should be used for the exchange of such results.

8. The Working Party agreed to collect further information on the application of the COY analysis to rye grass varieties and comments thereon for its next session. The information should be sent to Dr. S.T.C. Weatherup (United Kingdom). Mr. K. Kristensen (Denmark) would prepare a comparison of results of the application of the COY analysis to varieties of species other than grasses.

9. The Working Party noted that the information needed to apply the COY analysis was at present given in document TC/XX/5, in Annex IV of document TWC/IV/13, as well as in the documentation on the COY program and its users' guide which also included magnetic tapes distributed by Dr. Weatherup (United Kingdom) to certain interested States. As UPOV had now adopted these criteria

for grass varieties, the information should be combined in one document which could be updated at the same time. Dr. Weatherup (United Kingdom) offered to prepare an updated version as a form of guideline on use of the COY analysis for distribution to all member States. However, he would only circulate magnetic tapes upon special request.

10. Dr. Weatherup (United Kingdom) introduced document TWC/V/5 giving an evaluation of the application of the COY analysis to two-year and three-year data in the United Kingdom. The document confirmed the decision by United Kingdom experts to use, for the conditions prevailing in their country, the significance level of 0.1% for results of two years and of 1% for results of three years. Other member States will have to obtain more information so as to determine whether they could reach the same level of confidence or whether a level of 5% for results of three years would be applicable under their particular conditions. Several experts warned, however, that it might be difficult to explain to applicants and breeders that different yardsticks would be used in various member States to test the distinctness of one and the same variety.

11. Mr. M. Talbot (United Kingdom) reported on an investigation to reduce the broad range of variation in a given characteristic by comparing only the varieties close to the candidate variety. The investigation was based on data of spring height and date of ear emergence of red fescue varieties and these characteristics in all varieties were placed in order. He would continue the study to find out whether this method could be used as a supplement to the COY analysis to improve the possibilities for distinction in cases where varieties could not be distinguished otherwise. He would also study whether a different order of varieties would be necessary for each characteristic or whether one order for a single characteristic (e.g. ear emergence) could be fixed for the testing of all characteristics.

12. The Working Party agreed to include the modified joint regression analysis as an option in the COY program to be distributed. It could thus be used by member States which envisage difficulty in achieving the 1% level of significance to reduce the variation in certain characteristics.

13. Having noted the reluctance of experts in some Technical Working Parties to study the COY analysis, the Working Party agreed to discuss the use of statistical methods, as well as the reason and need for their application, at its next session. Mr. H.J. Baltjes (Netherlands) offered to prepare a discussion paper. In addition, Mrs. A. Campbell (United Kingdom) would prepare a questionnaire to collect information on the extent to which member States apply basic statistical methods. The questionnaire should be addressed to members of the Technical Working Parties for Agricultural Crops and Vegetables (or the Technical Committee).

14. In order to promote the use of the COY analysis in the field of vegetables, the Working Party asked Mr. Baltjes (Netherlands), Mr. B. Bar-Tel (Israel), Dr. F. Laidig (Federal Republic of Germany), Mr. S. Gregoire (France) and Dr. Weatherup (United Kingdom) to try to apply the COY analysis --if possible--to data on vegetable varieties such as onion, carrot or leak, and to send their results to the Office of the Union for further circulation, together with comments on the difficulties encountered or the reasons why it had not been possible to apply the analysis. Using this procedure in conjunction with direct contacts at the national level between the experts of this Working Party and of the Technical Working Party for Vegetables, it was hoped that vegetable experts could be encouraged or convinced to study or apply the

COY analysis to species in their field of competence as well. At the same time, the Working Party noted, however, that for most species handled by the Technical Working Parties for Ornamental Plants and Forest Trees and for Fruit Crops, there were fewer possibilities of applying the method because only a few characteristics were measured.

Testing of Homogeneity in Cross-Fertilized Plants

15. Mr. Talbot (United Kingdom) introduced document TWC/V/6 distributed during the current session which contained an evaluation of the over-years uniformity criterion presented to the Working Party at its previous session. The Working Party made several critical remarks on the method, especially on whether it was right to use a curvilinear adjustment or whether a linear adjustment should be used. This question would require further study. The Working Party endorsed the proposals for changes to the program as outlined on page 4 of document TWC/V/6, with the addition of the words "or varieties" after the words "the reference variety" in the last sentence of paragraph 1. It also agreed no longer to link the two-year test with the three-year test, but to establish them separately, as proposed on page 3 of the document. It is intended to incorporate the method as amended above in the program of the COY analysis as a subroutine within the whole package. Mr. Talbot (United Kingdom) will prepare a revised version of the program and a short explanation of the method to be included in the package. In this way, the combined over-years-analysis for distinctness and the over-years uniformity criterion could be applied to the same data and provide a means of evaluating the proposed new homogeneity criterion.

16. Some experts stated that standards should be studied so as to ensure that application of the method did not open the way to more and more heterogen varieties. Others stressed that a further study was necessary to ensure continuity of results compared to application of the present homogeneity criteria.

Testing of Homogeneity in Self-Fertilized Plants

17. The Working Party noted the information contained in paragraph 49 of document TC/XXII/7 and in Annex II of document TWC/V/13 Prov. It also noted the table contained in paragraph 28 of the General Introduction to Test Guidelines (TG/1/2) and asked how the table with the number of off-types tolerated for various sample sizes was established. Dr. Weatherup (United Kingdom) agreed to try to calculate the maximum number of off-types for several sample sizes not covered by the table but used by the member States (e.g. 1,000, 2,000, 3,000, 4,000 and 5,000) which will give the same nominal standard. Otherwise, however, the Working Party proposed to leave it to the other Technical Working Parties to raise questions on the subject.

Logical Order of States of Expression in Test Guidelines

18. Dr. Laidig (Federal Republic of Germany) introduced document TWC/V/4 on the logical order of states of expression in Test Guidelines. The Working Party noted that several virtually quantitative characteristics which are presented in the Test Guidelines by using qualitative expressions, for example, shapes, could sometimes be improved in their order of states of expression,

especially when a computer could help to screen varieties in these characteristics. The Working Party was aware of the fact that shape especially was a mixture of different characteristics and in certain cases different logical orders were possible. It recommended that the Technical Working Parties should consider breaking down those characteristics as far as possible into different characteristics or, if this was not possible, should ensure that the states of expression were always presented in a logical order. For this purpose, the experts could contact their computer experts at the national level. In addition, Dr. Laidig (Federal Republic of Germany) offered to check first drafts of Test Guidelines at the stage of their presentation to the professional organizations for comments to see whether the order of states of certain characteristics could be improved. The Working Party also stressed that the characteristic with the states "absent (1)" and "present (9)" should only be used in cases where there was a clear absence. Otherwise it recommended that the 1 to 9 scale should be applied with the first state reading "absent or very weak."

Description of Varieties

19. The Working Party noted document TWC/V/3 on the adjustments and final scores for red fescue data sets, as well as additional information received from Denmark and the Federal Republic of Germany and distributed during the session. Mrs. Campbell (United Kingdom) introduced the paper and highlighted the similarities and discrepancies between the methods used in various member States. She emphasized that there were certain similarities between the methods used in the United Kingdom and in Denmark, as well as between those used in the Netherlands and the Federal Republic of Germany, while in Israel different methods were used. In the discussion which followed this introduction, the experts from individual member States explained in more detail how they adjusted their missing data, what was the basis for the calculation of the LSD, whether they used calculations within the year or over the years, the number of years involved, how the methods stabilized the data over the years, and how they intended in future to arrive at more harmonized calculations. A summary of the main important points will be prepared by the chairman and circulated to the participants who will be asked to inform Mrs. Campbell (United Kingdom) of any corrections they would like to make to that summary, as well as of any similar additional information for methods used for species other than grasses. A revised summary would then be circulated to the members of the Working Party for discussion at the coming session.

20. In addition, Dr. Weatherup (United Kingdom) will prepare a document on the methods for the definition of the term "most similar variety."

21. Mr. Talbot (United Kingdom) will distribute a copy of the program for the calculation of variety scores from continuous measurements, as explained in document TWC/V/3, to the experts from Denmark, France, the Federal Republic of Germany, the Netherlands and Spain for their further study.

Harmonization of Gazette Entries

22. The Working Party postponed discussion on this item until its next session, awaiting the preparation of a document by Mr. Bar-Tel (Israel).

Progress Report on Electronic Information Exchange

23. Mrs. Campbell (United Kingdom) introduced the information given in a document distributed during the session and reproduced in Annex II to this report. The Working Party noted that it would only be worthwhile transmitting certain information by electronic mail, for example, information needed quickly or information requiring further data processing. For information which did not require further processing, transmission by facsimile could be envisaged. The experts were asked to inform the Office of the Union on the possibilities available (including the telefax number) in their offices. The Working Party also noted the warning that these new methods of transmitting information could lead to problems since information not transmitted through the normal routine channels could be lost or end up with persons other than the intended expert. The Working Party also noted the results of the transmission of the entire contents of the Danish Gazette to the United Kingdom and its return. The following problems arose during that process: lines were transposed, the special accented letters in Danish as well as those in French and German were distorted and pages were displaced.

24. The Working Party noted that, through bilateral agreements such as that concluded between the United Kingdom and France, it was now possible to have direct access to data on certain trials through the computer in Northern Ireland.

25. Mr. Talbot (United Kingdom) distributed document TWC/V/7 containing an updated list of computer center communications. The list is also reproduced in Annex III to this report.

Updated Summary on Hardware and Software of Currently Used Mainframe Computers

26. Mrs. Campbell (United Kingdom) distributed information on the existing hardware and on computer languages used in the member States, which had been compiled by her on the basis of information received from replies to the questionnaire distributed under circular U 1191. She reported that, in the table, she had only included information on main computers, which in almost all member States, with the exception of Hungary, were mainframe computers. The information is reproduced in Annex IV to this report. The Working Party noted in addition that most member States used FORTRAN as a language, the majority using FORTRAN 77.

27. The Working Party felt that more information should be collected on the Data Base Management Systems (DBMS) used by offices in the member States. Mrs. Campbell agreed to prepare a questionnaire on the software package, the design and the kinds of use, to be circulated to member States.

Report on the Structure of the Existing Data Base

28. The Working Party agreed to postpone discussions on this item until its next session when replies to the questionnaire mentioned in the previous paragraph had been distributed to experts in the member States.

Guidelines for the Production of Programs which can Readily be Assimilated Into Other Plant Variety Computer Systems

29. The Working Party noted document TWC/V/2 on the development of a library of software for variety evaluation, which was introduced by Mr. Talbot (United Kingdom). The Working Party agreed to the proposals made in the document and to receive a routine report on the development at each of its subseqent sessions. The Working Party asked Mrs. Campbell (United Kingdom) to prepare a draft list of information to be circulated for updating on the basis of document TWC/IV/4 on the exchangeable programs used on mini- or mainframe computers by member States prepared for the last session of the Working Party. The Working Party experts were asked to give Mrs. Campbell information on their software in sufficient time before the above-mentioned date so as to have it included in the draft to be circulated.

Future Program, Date and Place of Next Session

30. At the invitation of the expert from the United Kingdom, the Working Party agreed to hold its sixth session at Edinburgh, United Kingdom, from June 7 to 9, 1988. The meeting would start at 9 a.m. on June 7 and close at 1 p.m. on June 9, 1988. 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-third session of the Technical Committee and on questions raised by other Technical Working Parties (oral reports).

(ii) Combined over-years (COY) analysis:

(a) Dr. Weatherup (GB) to prepare updated guidelines for the use of the COY analysis by the end of July 1987 containing all necessary information in one single document. The experts to send to Dr. Weatherup by March 10, 1988, the output and comments of the updated program as applied to data of grass varieties for the preparation of a summary by May 1, 1988.

(b) Mr. Kristensen (DK) to report by May 1, 1988, on the application of the updated COY program to varieties of species other than grasses.

(c) The experts from NL, FR, GB, DE and IL to apply the COY analysis to certain data on vegetable varieties and to send the results and comments to the UPOV Office for distribution by March 10, 1988.

(d) Mr. Talbot (GB) to prepare a new paper on the ranking of varietes and the use of close varieties, if possible, by the end of April 1988.

(iii) Review of statistical practices:

(a) Mrs. Campbell (GB) to prepare a questionnaire on the randomization of plants and plots by the end of August 1987. The experts to send answers to Mrs. Campbell by the end of November 1987 for the preparation of a summary before the end of January 1988.

(b) Mr. Baltjes (NL) to prepare a paper on the reason and need for application of statistical methods by March 1, 1988.

(iv) Testing of homogeneity in cross-fertilized plants:

Mr. Talbot (GB) to prepare, by the end of the year, an updated version of his program and information for inclusion in the COY package prepared by Dr. Weatherup (GB). The experts to send their output and comments on that program to Mr. Talbot by March 10, 1988, for a summary to be prepared by April 25, 1988.

(v) Testing of homogeneity in self-fertilized plants:

Dr. Weatherup (GB) to calculate maximum tolerable off-type numbers for sample sizes of 1000, 2000, 3000, 4000 and 5000 with the same nominal standard as that used for the table in document TG/1/2, paragraph 28.

(vi) Description of varieties:

(a) The experts to send to Mrs. Campbell (GB) in October additions to the summary on the description of varieties (see paragraph 19 above), especially on methods used for varieties of species other than grasses for a revised version to be prepared by the end of the year.

(b) Dr. Weatherup (GB) to prepare a paper on the definition of the term "similar variety" by March 1, 1988.

(vii) Harmonization of gazette entries:

Mr. Bar-Tel (IL) to prepare a paper by the beginning of March 1988.

(viii) Report on existing data base management systems:

Mrs. Campbell (GB) to prepare a questionnaire on Data Base Management Systems by the end of August 1987. The experts to answer the questionnaire by the end of the year. A summary to be prepared by Mrs. Campbell by the end of February 1988.

(ix) Programs which can readily be assimilated into other plant variety computer systems:

The experts to give Mrs. Campbell (GB) informaton on exchangeable software by the end of the year. Mrs. Campbell to prepare a draft list for distribution and commenting by March 1, 1988. The experts to comment on that list before April 15, 1988.

(x) Progress report on machine vision techniques for variety identification:

The experts from the United Kingdom and the Netherlands to report on new developments.

(xi) Non-parametric methods:

Mr. Baltjes (NL) to prepare a paper by March 1, 1988.

(xii) Questions raised by other UPOV Technical Working Parties.

Chairmanship

31. As the chairmanship of Mrs. V. Silvey (United Kingdom) will end with the closing of the next ordinary session of the Council in October 1987, the Working Party unanimously proposed to the Technical Committee that it should recommend to the Council the election of Dr. F. Laidig (Federal Republic of Germany) as the new Chairman of the Working Party for the coming next three years.

Lectures, Visits and Demonstrations

32. On the afternoon of June 11, the Working Party heard a lecture by Mrs. Silvey (United Kingdom) on the research carried out at the National Institute of Agricultural Botany (NIAB), Cambridge, United Kingdom, with respect to the measurement of new characteristics for variety identification in wheat by using machine vision. During the lecture, special reference was made to the article by P.D. Keefe and S.R. Draper on "The Measurement of new Characters for Cultivar Identification in Wheat Using Machine Vision" published in Seed Science and Technology, No. 14, pp. 715-724, 1986. The lecture was followed by an intensive discussion on the potential application of machine vision for species identification as well as variety identification. The Working Party noted that experts in the United Kingdom were currently establishing a catalogue of wheat varieties and were investigating the use of machine vision for carrots and chrysanthemum leaves as well. The Working Party noted that research in the same direction was also taking place in the Netherlands. Because of the importance of the above-mentioned method, the Working Party agreed to include a special item on this subject in the agenda of its coming session.

33. On the morning of June 11, the Working Party heard a short introduction on the layout of the laboratory for data analysis; it visited the facilities available at the laboratory and saw demonstrations of the various programs. On the afternoon of June 10, the Working Party visited the trials field of the Experimental Station for Plant Varieties at Roskilde, attended an illustrated talk on the DUS trials done at the station of Tystofte and the use of hand-held data terminals.

34. This report has been adopted by correspondence.

[Four Annexes follow]

ANNEX I

LIST OF PARTICIPANTS
AT THE TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS
COPENHAGEN, DENMARK, JUNE 10 TO 12, 1987

I. MEMBER STATES

BELGIUM

Mr. D. REHEUL, Ministerie van Landbouw, Dienst tot Bescherming van de Kweekprodukten, 14e verd., Bolwerklaan, 21, 1000 Brussels (tel. (02) 2117211)

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Mr. A. JENSEN, Statens forsoegsstation, Tystofte, 4230 Skaelskoer (tel. 03-596141)

Mr. K. KRISTENSEN, Dataanalytisk Lab., Lottenborgvej 24, 2800 Lyngby (tel. 02 87 06 31, telefax (02 87 08 76)

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Mr. P. GAUTHIER, INRA/GEVES, La Minière, 78280 Guyancourt (tel. 30.83.36.00)

Mr. S. GREGOIRE, INRA/GEVES, La Minière, 78280 Guyancourt (tel. 30.83.36.00)

GERMANY, FEDERAL REPUBLIC OF

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Dr. F. LAIDIG, Bundessortenamt, Osterfelddamm 80, 3000 Hanover 61 (tel. 0511-57041)

ISRAEL

Mr. B. BAR-TEL, Department of Seed Research, Agricultural Research Organization, Volcani Centre, P.O.B. 6, Bet Dagan 50250 (tel. 03/980485)

NETHERLANDS

Mr. H.J. BALTJES, RIVRO, Postbus 32, 6700 AA Wageningen (tel. 08370-79111/79250)

Mr. G. VAN DER HEIJDEN, RIVRO, Postbus 32, 6700 AA Wageningen (tel. 08370-79111/79318)

SPAIN

Mr. M. DEL FRESNO ALVAREZ-BUYLLA, Registro de Variedades, INSPV, 56, José Abascal, 28003 Madrid (tel. 01-4418199, telefax: Instituto Relaciones Agraris (IRA) 4.42.86.12 with the mention "Por favor transmitir a Sr. (name of addressee))

SWITZERLAND

Mrs. M. JENNI, Leiterin des Büros für Sortenschutz, Bundesamt für Landwirtschaft, Mattenhofstrasse 5, 3003 Bern (tel. 031 612524)

UNITED KINGDOM

Mrs. A. CAMPBELL, National Institute of Agricultural Botany, Huntingdon Road, Cambridge CB3 0LE (tel. 0223 276381)

Mrs. V. SILVEY, Head of Seeds & Services Division, National Institute of Agricultural Botany, Huntingdon Road, Cambridge CB3 0LE (tel. 0223 276381)

Mr. M. TALBOT, Scottish Agricultural Statistics Service, University of Edinburgh, James Clerk Maxwell Building, The King's Buildings, Mayfield Road, Edinburgh EH9 3JZ (tel. (031) 667-1081, telefax (031) 667 7983)

Dr. S.T.C. WEATHERUP, Biometrics Division, Department of Agriculture for Northern Ireland (DANI), Newforge Lane, Belfast BT9 5PX (tel. 0232 661166)

II. OFFICER

Mrs. V. SILVEY, Chairman

III. OFFICE OF UPOV

Dr. M.-H. THIELE-WITTIG, Senior Counsellor, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland (tel. 022 999152, telefax (041-22) 33 54 28)

Mr. M. TABATA, Associate Officer, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland (tel. 022 999297, telefax (041-22) 33 54 28)

[Annex II follows]

ANNEX II

PROGRESS REPORT ON ELECTRONIC INFORMATION EXCHANGE

Following minute 41(viii) relating to the 4th TWP Meeting an exchange of information was initiated using electronic mail. The subject of the data transmitted from the UK was an extract from the Plant Varieties and Seeds Gazette Number 264 - dated January 1987.

The circulation initially involved TWP members with Micromail electronic mail user addresses as listed in document TWC/IV/II, prepared by Mike Talbot (UK). This restricted the circulation to Denmark, Eire and Netherlands, as well as between centres in the UK.

The purpose of the exchange was to acknowledge the receipt of the document; transmit a similar document to the list of Micromail users and to submit comments, from technical staff, as to the usefulness of such a method of transmission.

To date, mid-May, acknowledgement has been received from Denmark together with a full Gazette transmitted by Micromail.

Comments from technical staff within NIAB, UK, as to the usefulness of such a method of transmission for routine DUS/VCU tests; indicate that the receipt of a posted copy kept in the library for reference when needed, is satisfactory. It is acknowledged that the transfer of more time-dependent material could be more efficiently exchanged by electronic methods.

In conclusion, it is technically possible to transmit documents to UPOV member states, given suitable hardware and software, but the identification of which documents could benefit from such treatment is outside the scope of this TWP.

J R Law
NIAB, UK

[Annex III follows]

TWC/V/8

ANNEX III

COMPUTER CENTRE COMMUNICATIONS

The tables below summarise the present position on the principal routes for passing information in computer-readable form between national variety testing agencies. If there are corrections or additions can these be inserted in the table and brought to the TWP meeting in Copenhagen for collation and exchange?

M. Talbot
20 May 1987

LINKS TO ELECTRONIC MAIL

Country	Department	User number	Carrier
DK	DATAANALYTISK LAB., Lyngby	71: DKA003	DATABOKS
IRL	DEPT. OF AGRIC., Dublin	74: EIM205	EIRMAIL
NL	RIVRO, Wageningen	27: NLX021	MEMOCOM
GB	NIAB, Cambridge	81: MMU414	TELECOM GOLD
GB	DAFS/SASS	81: MMU283	TELECOM GOLD

LINKS TO PACKET SWITCHING

Country	Department	Computing Centre	Operating System	Comms. Protocol	Network User Address
DK	DATAANAL. LAB	UNI.C LYNGBY	MVS/VM	X25	238242127000
				X21/V24	
				EARN-RSCS	DALKSK02 @ EARN.NEUVM1 or AN05002 @ EARN.NEUMVS1
FR	GEVES	La MINIERE	VAX/VMS	X25	178061571
NL	RIVRO	LANDBOUW-HOGESCHOOL		EARN-RSCS	HWALHW5 @ EARN.HEARN
GB	DAFS/SASS	ERCC	EMAS	X25	234231354354
				EARN-RSCS	%UK.AC.EDINBURGH

ACCEPTABLE MAGNETIC TAPE FORMATS*

Country	Department	Block Size	Records Block	Label	ASCII EBCDIC	Additional Constraints
D	BUNDESSORTENAMT			no label	either	one file only
DK	DATAANALYTISK LAB.			no label or IBM stand	either	
ES	INSPV				EBCDIC	
FR	INRA/GEVES	2000	25	no label	ASCII + EBCDIC	
IRL	DEPT. OF AGRIC.			no label	EBCDIC	
NL	RIVRO				either	
GB	NIAB				EBCDIC	
	DANI				EBCDIC	
	DAFS/SASS				EBCDIC	fixed length blocks with block size a multiple of record size

[Annex IV follows]

Information of the Existing Hardware and on Computer Languages used.

COMPUTER HARDWARE	DK	ES	FA	JP	NL	GB Eng	GB SCOT	GB N.I.	D	Ireland	Hungary	Sweden	NZ	SA
Main Computer														
Company	IBM	BURROUGHS	DEC	HITACHI	DEC	PRIME	PRIME	DIGITAL	SIEMENS	IBM	COMMODORE	Carl Lamm System AB	DIGITAL	BURROUGHS
Model	3081 (MVS/TSO)	A-3	11/750	HITAC M-240H	PDP11/44 +Micro VAX II	2250	550	VAX 11/750	7 530-M	4361-5	64	Zilog 8000/130	VAX 750 (not used at present)	B7900
Internal memory (Mb)	6	6	8	8	1.5 (+9)	4	2	8	6	4	0.064	4	16	-
External memory (Mb)	>10,000	1000	450	4200	512 (+456)	630	240	698	2000	12	1	337	400	-
Tape														
Bits per inch	1600-6250	800-1600	1250/6250	1600-6250	1600	1600	800-1600	1600	1600-6250	1600-6250	-	6250	-	-
Protocols supported	IBM 3270 2780 3780	IBM 2780 IBM 3780	X25 DECNET (ETHERNET)	HDLC HNA HSC	DECNET	IBM 2780 IBM 3780	PRIMOS	ASCII EBCDIC	-	BTAM/VTAM	-	3270 2780 SNA VT 100 3780 VT 220	-	-
Languages	FORTRAN PL/1 PASCAL ALGOL	FORTRAN PL/1 ALGOL COBOL	FORTRAN BASIC	FORTRAN PL/1 COBOL	FORTRAN BASIC	FORTRAN PL/1 PASCAL PMA BASIC	FORTRAN RATFOR PASCAL BASIC	FORTRAN BASIC	FORTRAN ASSEMBLER RPG 	FORTRAN ASSEMBLER GUEST RPG II COBOL	 BASIC	FORTRAN ASSEMBLER PASCAL C BASIC DIBOL COBOL	FORTRAN PASCAL 	FORTRAN ASSEMBLER PASCAL C BASIC CANDE COBOL
Access Modes	-		Local Dial up	VSAM SAM DAM	Direct Sequential	Batch Interactive	Batch Interactive	Batch Interactive	SAM ISAM	CICS	- -	Batch	- -	- -
DBMS used	SIR	DMS II	RDB DTR	ADABAS PDM II	ORACLE	INFORMATION + SIMPLE	CVT	DATATRIEVE	SESAM + SQL	DL/1 VSAM	-	INFORMIX UNIPLEX	RDB	In-house
Access to International Comms. Networks	EARN	-	TRANSPAC	None	MEMOCOM	IPSS	IPSS EARN	JANET	None	EIRPAC	None	UNIX networks	DECNET	Yes

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[End of Annex IV and of document]