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**TECHNICAL WORKING PARTY
FOR
AGRICULTURAL CROPS**

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QUESTIONNAIRE ON MANAGEMENT OF REFERENCE COLLECTION

Document prepared by experts from Denmark

SURVEY ON MANAGEMENT OF REFERENCE COLLECTION

The "Questionnaire on Management of Reference Collection" was elaborated during the autumn-winter 1999-2000. It was circulated to all UPOV member States in March 2000. In the UPOV 1991 Convention, Article 7, it is written:

"Distinctness

The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application. In particular, the filing of an application for the granting of a breeder's right or for the entering of another variety in an official register of varieties, in any other country, shall be deemed to render that other variety a matter of common knowledge from the date of the application, provided that the application leads to the granting of a breeder's right or to the entering of the said other variety in the official register of varieties, as the case may be."

Furthermore the reference collection is mentioned several times in TC/36/7 (the new General Introduction) e.g.:

TC/36/7 – page 28 - end of 1st paragraph

"The robustness of the rights awarded depends, in particular, on the existence of as complete a collection as possible of the known varieties of the species concerned, from which the new variety must be sufficiently different."

TC/36/7 – page 31 – last paragraph

"Conclusion

The availability of the largest possible reference collections of well known varieties is essential to ensure the true efficacy of the system for granting plant breeders' rights certificates. In addition to its efforts to produce guidelines for the harmonisation of testing, UPOV must, as it develops, propose solutions for the effective constitution and management of such collections. This challenge is continually increasing due to the globalisation of varietal creation and the resulting exchanges of plant material, and debate concerning conservation and the appropriation of biodiversity."

TC/36/7 – page 34 - 2.

"2. REFERENCE COLLECTIONS

Theoretically, the full reference collection to be used for comparison purposes for any candidate variety is the known world-wide collection of varieties of the same species and crop. However, in practice, the number of varieties which has been included in a growing test can often be reduced by the careful selection of those reference varieties only from similar

environmental regions and of the same crop type. *The selection can usually be further narrowed down to only the most closely similar varieties by using the variety description and the information on the most similar varieties supplied by the breeder in the Technical Questionnaire.* This information allows the testing authority or crop expert to use the grouping characteristics set out in the relevant UPOV Technical Guideline to limit the number of varieties from the reference collection which must be used as control varieties in the growing test. This significantly reduces workloads and the attendant costs.”

Unless the last mentioned paragraph (especially the sentence written in italics) a heavy burden is put on the shoulders of the testing authorities. The aim of this questionnaire is to gather relevant information on the composition of reference collections in the DUS-testing in the different member States. There are questions of a general nature in relation to DUS-testing, but to have a clear picture of the method and to be very specific most questions are directly related to the composition of the reference collection of barley. Furthermore an empirical survey on the actual reference collection of the year 2000 was conducted. To evaluate the efficiency of desk research, pregrouping or pre-screening, two unknown varieties are presented by their technical questionnaire and the official elaborated description. The desk research used to pre-screen the reference collection based on the official description is a check on the harmonisation of the state of expressions of the individual characteristics between member States.

Thirteen countries have answered the questionnaire Questions 1 to 11 and ten countries have given answers to Question 12. The replies of the answering countries regarding Questions 1 to 11 are quite heterogen and because of this they are presented fully grouped by the questions on the following pages.

QUESTIONNAIRE ON MANAGEMENT OF REFERENCE COLLECTION

1. Information on the expert who has answered this questionnaire

Country	Name of answering person:	Address
AR	Marcelo Daniel Labarta	Av. Paseo Colón 922 – 3° office n° 347 (1063) Buenos Aires
AT	Fuernweger Barbara	Bundesamt und Forschungszentrum für Landwirtschaft Spargelfeldstraße 191 A-1220 Vienna, Austria
CA	Christine Irving/Valerie Sisson	59 Camelot Drive, Nepean, Ontario, K1A 0Y9, Canada
CH	R. Guy	Station fédérale de recherches en production végétale de Changins, Case postale 254, CH-1260 Nyon 1, Switzerland
DE	Beate Rücker	Bundessortenamt, Osterfelddamm 80, 30627 Hannover, Germany
DK	Erik Lawaetz	Department of Variety Testing, Teglværksvej 10, Tystofte, DK-4320 Skælskør, Denmark
FR	Marie-Noël MISTOU	GEVES, La Minière, 78285 Guyancourt CEDEX, France
NL	Henk Bonthuis	Plant Research International (former CPRO-DLO), P.O.Box 16, 6700 AA Wageningen, The Netherlands
NZ	Mr. P.J. Rhodes	Plant Variety Rights Office, PO Box 130, Lincoln, Canterbury, New Zealand
PT	Maria Teresa Carrilho	Edifício II - Tapada Da Ajuda, 1349-018 Lisboa, Portugal
RU	Mrs. Tatiana Makeeva	State Commission of the Russian Federation for Selection Achievements Test and Protection, 1/11 Orlicov per. Moscow 107139, Russian Federation
SK	Mrs. Bronislava Bátorová	Slovakia Central Agricultural Control and Testing Institute, , Matuskova 21, SK-833 16 Bratislava
UK	Peter Button	MAFF, Plant Variety Rights Office / Seeds Division, White House Lane, Huntingdon Road, Cambridge CB3 0LF, UK
ZA	Mrs. H. Grobler	Dept. of Agriculture, Directorate Genetic Resources, Private Bag X 974, Pretoria 0001, South Africa

2. Management of collections of propagating material in general

Q1. Does your testing authority establish and maintain collections of propagating material of varieties?

Yes, collections of propagating material of varieties have been established for various species. (Please proceed to Q2).

AT; DE; DK; FR; NL; NZ; PT; RU; SK; UK; ZA;

No, Please explain shortly your testing system and way of evaluation in relation to the examination of the DUS-requirements (max 4-5 lines)

AR; CA; CH;

AR:	No, in Argentina we adopted the "breeder system" for the examination of the DUS requirements. Only for some species we establish and maintain collections of propagating material: <i>soybean, wheat, barley, oats and rape</i> .
CA:	Canada has a breeder testing system. The breeder conducts trials for DUS and completes the variety description based on test guidelines provided by our office. An examiner from our office visits all tests sites
CH:	We don't make examinations ourselves.

Q2. Please fill in the (approximate) numbers of varieties maintained by those collections of propagating material of varieties in each genus and species of agricultural crop.

Number of varieties	AR	AT	DE	DK	FR	NL	NZ	PT	RU	SL	UK	ZA
Barley	14	76	160	245+112	750	24	12	18	37	145	349	10
Bent		-	22		32	36	3		2	11	n/a	-
Broad Bean, Field Bean		17	25	30	106	-	0		2	17	28	-
Cocksfoot		-	15		88	-	6	3	2	23	n/a	4
Common Vetch		11	12		79	-	0	4	6	-	n/a	-
Cotton		-	--		-	-	0		-	-	n/a	33
Durum Wheat		12	13		170	-	1	36	14	17	n/a	3
Flax, Linseed		7	18 ^{*)}		149	(110*)15	1		4	10	45	-
Fodder Beet		-	34	49	90	13	0		5	7	n/a	4
Groundnut		-	--		-	-	0		-	-	n/a	16
Kentucky Bluegrass		-	67		80	108	0		5	27	n/a	-
Lucerne		-	14 ^{*)}		269	-	3	4	10	-	n/a	38
Lupins		-	26		59	-	0	5	2	-	n/a	30
Maize		370	432		3833	-	0	110	30	360 Hybrids, 200 Lines	n/a	503
Meadow Fescue, Tall Fescue		-	40	36	117	12	7		2	14	n/a	16
Oats	10	26	47	125	280	9	11	28	15	95	71	21
Peas		26	70	171	10	(240*)12	26		30	44	Field Pea 725 Pea 2075	47
Potato		85	260		-	325	(32)		30	250	1070	18
Rape Seed	30	-	530	137+402	522	(294*)15	8		5	155	185	6
Red Clover		-	58		80	-	3		10	41	n/a	4
Rice		-	--		9	-	0	5	22	-	n/a	3
Rye		48	52		125	-	1		18	66	n/a	17
Ryegrass		-	230	327	813	662	42	5	6	67	900	43
Safflower		-	1		-	-	0		-	-	n/a	-
Sheep's Fescue, Red Fescue		-	165	178	296	152	2		2	17, 74	n/a	-
Sorghum		3	9		591	-	0	10	8	-	n/a	16
Soya Bean	160	-	6 ^{*)}		177	-	1		-	16	n/a	70
Sunflower		-	26 ^{*)}		2024	-	0	80	1	124 Hybrids, 63 Lines	n/a	98
Swede		-	3 ^{*)}		9	-	4		-	-	200	2
Timothy		-	31	67	25	83	1		-	25	64	-
Triticale		10	45		128	-	1	16	5	101	n/a	15
Turnip, Turnip Rape			8 ^{*)}		15	-	0		-	-	625	4
Wheat	50	72	190	74+273	1115	23	28	58	113	139	184	68
White Clover		-	17 ^{*)}		50	-	17		4	16	99	8
<i>Bromus</i>		-	--		39	-	6			-	n/a	2
Fodder Radish		6	46		15	-	0			-	n/a	-
<i>Lotus</i>		-	9		21	-	2			-	n/a	-
Subterranean Clover		-	2		1	-	0	2		-	n/a	-
Sugarcane		-	--		-	-	0			-	n/a	-
Tobacco		-	16		-	-	0			-	n/a	29
White Mustard		10	53	72	78	-	0			-	n/a in past 5 years	-
Others:				129		32	27					
Poppy		5										
Marrow for oil		5										
Phacelia		4										
Buckwheat		4										
Chick pea								4				
Layhyrus cicera								2				
Sugar Beet				204				8				
Borage											4	
Watercress											6	
Total:			2239	2631		2123	213	398				1333

DE: **) DUS is not tested in Germany; Maintenance of standard samples for protected/listed varieties

NL: **Note:** these are collections which are actively maintained. (* figures between brackets refer to collections which are maintained in stock – that is not actively maintained). Next to these collections we “maintain” database collections of variety descriptions for desk research.

3. Collection for barley

Q3. Please indicate the size of the collection of propagating material of barley, the composition of the collection and the number of varieties to be used in the evaluation of the DUS-purpose preferably in the year 2000.

	AR	AT	DE	DK	FR	NL	NZ	PT	RU	SK	UK	ZA
1) the current number of spring barley varieties in the collection of propagating material (including candidate varieties)	14	Spring barley 103	144	245	368	49	12	18	82	145	163	10

2) the composition of the reference collection of propagating material (e.g., all varieties protected and listed in the national list, all varieties in OECD catalogue and candidate varieties)

<p>AT:</p> <ul style="list-style-type: none"> • All varieties protected and listed • All candidate varieties • Example varieties (UPOV-TG, example varieties of other countries)
<p>DE:</p> <ul style="list-style-type: none"> • all varieties protected and/or listed in Germany • foreign varieties which are multiplied and certified in Germany • candidate varieties with priority
<p>DK:</p> <ul style="list-style-type: none"> • all varieties protected and/ listed in Denmark • varieties listed in DE, GB, SE, FR, IR, NL and EU (CPVO) • varieties listed and/or protected in countries we have bilateral agreements with • example varieties (if available)
<p>FR:</p> <ul style="list-style-type: none"> • Candidate varieties • Protected and registered varieties in France • Protected and registered varieties in EU • OECD catalogue (countries with similar type of agriculture and climate)
<p>NL:</p> <ul style="list-style-type: none"> • all varieties listed in the national list • reference varieties based on TQ of the breeder • reference varieties based on a var-description from our own research, that is in the database collection • varieties in VCU-research (but not for DUS) in the Netherlands • candidate varieties

<p>NZ:</p> <ul style="list-style-type: none"> • 8 varieties with PVR, • 4 varieties that are grown commercially that do not have PVR. • New Zealand does not have a system of national listing. Any free (non-protected) variety can be grown by anyone at any time.
<p>PT:</p> <ul style="list-style-type: none"> • Varieties listed in the National list and • some of the Common Catalogue, others than the ones listed in Portugal, and • the candidate varieties, when they are presented.
<p>RU:</p> <ul style="list-style-type: none"> • all varieties protected and • listed in the national list – 37; candidate varieties – 45
<p>SK:</p> <ul style="list-style-type: none"> • all varieties protected and listed in the national List • - some of the varieties in OECD catalogue • - candidate varieties • - example varieties from UPOV TG
<p>UK:</p> <ul style="list-style-type: none"> • all varieties with UK PBR or on the UK National List (including "export only" and "hybrid parent" varieties); • all candidate varieties including those being tested on behalf of other EC Member States; • all varieties on the EEC Catalogue of which seed is marketed in the UK; • all varieties listed or protected in other EC Member States and which are known to be similar to the candidate variety; • all varieties nominated by the applicant as close controls to candidate varieties currently being tested • readily available varieties nominated by another authority where tests are being carried out on their behalf; • readily available UPOV "example varieties" which are necessary to establish states of expression of some characters; • readily available varieties listed or protected in a UPOV member state which is within the environmental area appropriate to the varietal type and which are known to be similar to the candidate varieties currently being tested; • all varieties that completed tests in 1999 on which a decision on the award of UK PBR and/or UK National Listing has yet to be made; • x. all new candidate varieties in DUS test years 1 and 2.

	AT	DE	DK	FR	NL	NZ	PT	RU	SK	UK
3) the number of barley varieties (excluding candidate varieties) in the collection which were sown or planned to be sown for evaluation purposes in the year 2000 along with candidate varieties	27	59	207	141	27	na since 1997	18	31	105	129

Q3. (cont.)

	AT	DE	DK	FR	NL	NZ	PT	RU	SK	UK
4) the number of candidate varieties of barley which were sown or planned to be sown for evaluation purposes in the year 2000	50	85	38	63	3 CV DUS 13 CV VCU (DUS outside NL)	nil	n/a	45	40	131

Q4. Please identify the management method of the collection for barley

- All or almost all varieties in the reference collection are cultivated in the field for the DUS purpose
AT; DE; DK; SK; ZA;
- Only varieties similar to candidate varieties are selected from the collection and are cultivated in the DUS trial together with candidate varieties.
FR; NZ; PT; RU; UK;
- All propagating material in the reference collection is only stored as standard material of varieties (= No varieties are grown by the testing authority in the field)
- Others (please indicate)
AR; DE; DK; FR; NL;

AR:	All propagating material in the reference collection is only stored as standard material of varieties (No varieties are grown by testing authority in the field).
DE:	Because of the high number of candidate varieties and the limited possibilities for grouping almost all varieties are similar to some candidates.
DK:	Because of the high number of candidate varieties and limited possibilities for grouping almost all varieties are similar to some candidates.
FR:	Varieties in the reference collection are cultivated in the field for 3 years when we receive seeds, for description.
NL:	All varieties on the national list, varieties similar to the candidate varieties (indicated by TQ and/or OECD/EU variety list) and all varieties in VCU test are cultivated in the field for DUS purposes

Q5. Please indicate the method used in general for obtaining(/renewing) propagating material of barley varieties protected only in the other countries.

- Request the breeder/maintainer to provide a sample
AR; DK; FR; NL; PT; RU; SK;
- Request the national authority in charge of the DUS-testing to provide a sample
AT; DE; SK; UK;
- Others (please indicate)
NZ, UK, ZA;

NZ:	Only barley varieties commercially available in New Zealand are included in DUS tests
UK:	The National Authority requests material direct from the maintainer; material is then forwarded to the Examination Office (NIAB)
ZA:	We don't use other countries' varieties.

Q6. Please explain the practice of checking the identity of a new sample provided by the maintainer/breeder upon the request from the national office to renew the stock of propagating material for barley.

AR:	The breeder/maintainer is responsible for the sample. If the sample was checked by the national office and it was found out that both descriptions were not coincident, the National Seeds Act in its Section N° 30 – Reglamentary Decree 2183/1991 – Seed Act N° 20247, establish: “ The Property Title of a variety shall expire according to the following reasons: item d) When the owner shall not provide a live sample of the protected variety, with the same characteristics as the original variety...”.
AT:	Cultivation in the field for DUS-testing together with the old sample and in comparison with the UPOV-description of this variety
DE:	The new sample is grown in the field side by side with the old standard sample. The identity is checked visually.
DK:	Varieties for/on the national list: The new sample is grown in the field side by side with the old standard sample. The identity is checked visually. Varieties for reference collection The new sample is just replacing the old standard sample. There are no identity check.
FR:	The new sample provided by the maintainer is compared to the original seed sample (6 rows. 2 locations)
NL:	By growing the original identity sample next to the new sample.
NZ:	New sample should fit the description of the variety previously grown and described.
PT:	The new sample is sown alongside the original one. For subsequent renewals, the new material is sown alongside the previous sample and then they are compared between them.
RU:	Еще не запрашивали. Посев рядом старого и нового образца. Yet did not request.
SK:	checking of the information from the maintainer/breeder National elaborated description
UK:	The new sample is compared to the original stock in a single comparison of side-by-side cultivated field plots
ZA:	Not applicable.

Q6-2. Please explain the practice of checking the identity of a sample provided for foreign reference varieties for the first time.

AT:	Cultivation in the field for DUS-testing and comparison with the UPOV-description
DE:	The identity of a sample of a foreign variety provided by the breeder is checked in a field test against an official sample requested from the national authority in charge of the DUS-test.
DK:	There are no identity check – it is the breeder/maintainers responsibility to provide the right sample of the variety in order to protect his rights.
FR:	No check for foreign reference varieties for the first time .The conformity is upon the responsibility of the maintainer
NL:	Material (provided by the breeder) is not checked on identity
NZ:	n.a.
PT:	We proceed to the regular description of the variety, according to the appropriate guideline, and then compare it to the description provided by the original authority.

RU:	Посев в поле и сравнение с описанием. Crop in a field and comparison with the description.
SK:	checking of the characteristics for which the variety is recommended
UK:	The variety is grown in a cultivated field plot and compared to its description provided by the National Office. (At the same time the identity of stocks entered for Value for Cultivation and Use (VCU) performance trials may be grown and checked in side-by-side cultivated field plots)
ZA:	Not applicable.

Q7. Please indicate the main difficulties encountered in the management of reference collection for barley as well as the practices taken for overcoming them.

AR:	Our DUS system is based on information declared by the applicant (affidavit). If the variety was not described properly, it would be difficult to decide about the application. Accordingly, the national office brings the breeder technical support in order to make an adequate application.
AT:	A lot of UPOV-example varieties are not cultivated in Austria, the use of them would extend the trials to the number of candidate varieties -the fast change of varieties in the NLI -> predominant use of national protected and listed varieties
DE:	The size of reference samples provided by other authorities is often too small. The minimum sample size we need is 200 g.
DK:	In the management of our barley reference collection we ask breeders of foreign varieties for 3 kg of their variety, and we have no problems to get what we ask for. ID-check of many foreign reference varieties is very laborious. It is in the breeders interest to submit us with his protected material – we assume that he gives us the requested genotype Example varieties are difficult to collect/receive
FR:	Difficulties to get seeds from certain countries (new and old varieties) and from certain maintainers (old varieties)
NL:	Control on observation data from different sources Non-harmonised data Computer program for distinction analyses is only used for local (own) data.
NZ:	Seed germination can decrease over time. Periodic checks are made to ensure germination is of a minimum level – when it falls below the minimum fresh seed of the variety is requested from the maintainer.
PT:	The problems found in the management of our reference collection are of field growth nature, but we try to solve them with suitable technical procedures.
RU:	Работа по созданию коллекции сортов-эталонов находится на начальном этапе. Размер коллекции пока недостаточен. Имеются материальные трудности. The work on creation of reference collection is on the initial stage. The size of a collection while is insufficient. There are material difficulties.
SK:	the renewing of the stock of propagating material to obtain the example varieties (some of them are no more available)
UK:	<ol style="list-style-type: none"> 1. Obtaining replacement stocks of varieties in time for sowing. Stocks arriving too late are held over for sowing in side-by-side cultivated field plots in the following year. 2. Obtaining seed and descriptions of varieties of foreign varieties in time for sowing. Varieties arriving too late are held over for sowing in side-by-side cultivated field plots in the following year. 3. Obtaining “most similar” reference varieties or descriptions of them cited by the applicant on the TQ. Varieties arriving too late are held over for sowing in side-by-side cultivated field plots in the following year or a description only entered onto the computer data base. 4. Obtaining UPOV example varieties which may no longer be easily available.
ZA:	No problems.

4. Identification of varieties similar to a candidate variety of barley

Q8. Who first chooses similar varieties (reference varieties) for a candidate variety in the case of barley.

National Office
AT; DE; DK; FR; NL; NZ; RU; SK; ZA;

Applicant
UK;

then, the similar varieties (reference varieties) are checked by the national office

FR; UK;

reference varieties proposed by the applicant are accepted
NL; SK;

-- What kinds of information is available to applicants if they first choose similar varieties.

AR:	The applicant first chooses similar varieties for a candidate variety. Then, the similar varieties are checked by the national office. The national office may give to the applicant the description of the registered varieties only, because the information about varieties in registration is confidential.
CA:	Applicant, reference varieties proposed by the applicant are essentially accepted but the national office may question some choices of similar varieties. If they are not deemed appropriate we would require that the applicant choose other reference varieties.
NL:	not applicable
PT:	In Portugal, the reference collection for barley is a relatively small one, so almost all the varieties are sown for DUS purposes year after year. The similar varieties indicated by the applicant are always included in the trial and its design takes into account the closeness between the similar varieties mentioned by the applicant and those chosen by the examination office and the candidate variety.
SK:	Description according to the UPOV Guideline
UK:	1. Their own descriptive information based upon the knowledge of their own varieties. 2. Variety descriptions published by NIAB.

Others (please indicate)
PT;

PT:	In Portugal, the reference collection for barley is a relatively small one, so almost all the varieties are sown for DUS purposes year after year. The similar varieties indicated by the applicant are always included in the trial and its design takes into account the closeness between the similar varieties mentioned by the applicant and those chosen by the examination office and the candidate variety.
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Q9. Which varieties are included in the database/collection of variety description of barley used for identifying varieties similar to a candidate variety ? (multiple choice)

- Varieties protected in the country
AT; DE; DK; FR; NL; RU; SK; UK; ZA;
- Varieties listed in the national list in the country
AT; DE; DK; FR; NL; PT; RU; SK; UK; ZA;
- Varieties protected in foreign countries
AT; FR; NL; PT; SK; UK;
- Origin of the description in the database/collection
- original elaborated description
AT; PT;
- National elaborated description
NL; PT; SK; UK;
- Varieties listed in foreign countries
AT; DE; DK; FR; NL; PT; SK; UK;
- Origin of the description in the database/collection
- original elaborated description
AT; DE; PT;
- National elaborated description
DE; NL; PT; SK; UK;
- Other data (please indicate)
AR, CA, NZ; UK

AR:	In our database collection of varieties description of barley used for identifying similar varieties to a candidate variety, we include varieties protected in the country and varieties listed in our National List.
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CA:	We do not have a database/collection of variety descriptions. In theory, applicants must take into consideration all varieties worldwide but in practice it is usually only varieties on our national list. The description of the candidate variety is published in our Plant Varieties Journal for other interested parties to review. If there are any objections, e.g. that the most similar variety was not grown in comparison, then the applicant may be required to do further tests using the said similar variety.
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NZ:	All varieties grown commercially in New Zealand at the time of application for the candidate variety are considered as a comparator for the candidate. A variety will only be eliminated as a comparator if it has been previously grown in DUS trials and there is absolutely no doubt that it is distinct on the basis of information supplied by the breeder about the candidate variety and the information known about the comparator. Generally most if not all varieties are included as comparators in case the information supplied by the breeder about the candidate variety is not accurate.
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UK:	See also answer to Q2 above
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Q10. What kinds of information are used for the selection of similar varieties for barley.

- [x] All characteristics in the national Test Guidelines for barley
FR; SK;
- [x] Technical questionnaire in UPOV Test Guidelines
AT; DE; DK; FR; NL; NZ; RU; UK;
- [x] - Lower leaves: hairiness of leaf sheaths (characteristic 2)
DE; FR; NZ; UK;
- [x] - Time of ear emergence (first spikelet visible on 50% of ears)
(characteristic 7)
AT; FR; NZ; PT; RU;
- [x] - Awns: anthocyanin coloration of tips (characteristic 8)
AT; DE; FR; NZ; UK;
- [x] - Plant: length (stem, ear and awns)(characteristic 12)
AT; FR; NZ; RU;
- [x] - Ear: number of rows (characteristic 13)
AT; DE; DK; FR; NL(4); NZ; PT; RU; UK;
- [x] - Grain: rachilla hair type (characteristic 22)
AT; DE; DK; FR; NL(2); NZ; PT; RU; UK;
- [x] - Grain: hairiness of ventral furrow (characteristic 26)
AT; DE; DK; FR; NL(3); NZ; PT; RU; UK;
- [x] - Seasonal type (characteristic 29)
AT; DE; DK; FR; NL(1); NZ; RU; UK;
- [x] Other criteria and information to be used for grouping or pre-screening
AR, AT, CA, FR; NL, UK, ZA

AR: Firstly we make a pre – screening operation considering the following characteristics:

- Hairiness of leaf sheaths;
- Flag leaf: anthocyanin coloration of auricles;
- Ear: number of rows;
- Ear: shape;
- Ear: glaucosity;
- Ear: position;
- Ear: density;
- Awn: presence;
- Awn: anthocianic color;
- Steril spikelet: presence;
- Grain: rachilla hair type.

If the variety was similar to another variety, after the pre – screening operation, it must be checked for all the characteristics in the national descriptor for barley, including the UPOV characteristics marked with asterisk.

AT: Information on the origin of the variety

CA: The main grouping characteristics would be ear: number of rows and seasonal type.

FR:
<ul style="list-style-type: none"> • Awn : spiculation on central nerve • Rachis : segments attitude (in mid third of ear) • Rachis : convex surface of the rachis segment (in mid third of ear) • Rachis in mid third of ear : inner basal hairiness • rachilla : length relative to grain • rachilla : length relative to rachis segment • grain : spikulation of outer lateral nerves of dorsal side at lemma • grain : width of the ventral furrow • kernel: coloration of aleurone layer after HCL reaction
NL: Relationship (based on information from the breeder).
UK: Any special distinguishing characteristics of the new variety declared by the applicant on the TQ. The characteristics of the parents, if known, given on the TQ.
ZA: We plant all varieties on the National Variety List.

Q11. Please explain the method of identifying varieties similar to a candidate variety of barley (pre-screening or grouping method). In particular, if you answer “All characteristics in the national Test Guidelines for Barley” in Q10, please explain in detail how to determine similar varieties (reference varieties).

AT:	<p>In the first year of VCU we make DUS-testing only for internal information. Grouping of the material according to the breeder's information in the technical questionnaire.</p> <p>There will be a main reduction of the candidate varieties after the first year of VCU-testing (because of the VCU results).</p> <p>First year of DUS-testing (second year of VCU), prescreening of the material with the assistance of Dbase IV (in future use of ACCESS).</p> <p>Cultivation of similar varieties and candidate varieties in the field according to the DUS-results of first year VCU and results of the computer prescreening.</p> <p>The DUS-testing (according to the UPOV-TG) starts in the second year of VCU-testing and shall be finished in the third year of VCU.</p>
DE:	<p>The descriptions for the reference varieties are stored in a database. Based on the grouping characteristics (Char. 2, 8, 13, 22, 26, 29) indicated in the Technical Questionnaire of the candidate varieties similar reference varieties are selected from the database. Additionally Plant height and Time of flowering can be taken into consideration (varieties are considered to be similar if the difference is lower than 3 notes). Usually in cereals almost all reference varieties are similar to at least one candidate and therefore all varieties have to be grown.</p>
DK:	<p>The grouping (see Q10.) from the Technical Questionnaire are stored in a database. The candidates and reference varieties are sorted into these groups. If there are any groups without candidates the reference varieties in this group are not seeded in the field</p>

FR: Qualitative characteristics :

Each candidate variety is compared to each reference variety by a morphological distance.

For each characteristic we have defined a distinction matrix containing the weights attributed to each difference observed between the candidate variety and the reference variety.

The weight **p** is between 3 and 15 for spring barley.

For example :

	1	2	3	4	5	6	7	8	9	(note var candidate)
(ref var)1	0	0	0*	3	15	15	15	15	15	
2		0	0	0	3	5	15	15	15	
3			0	0	0	3	15	15	15	
4				0	0	0	3	5	15	
5					0	0	0	3	5	
6						0	0	0	3	
7							0	0	0	
8								0	0	
9									0	

(*1 is not considered different from 3.

**5 is considered different from 2 with a weight of 3.)

- A distinction threshold is defined , called **S** (S=15 for spring barley)
- The weight's Sum (Σp) obtained for all characteristics is compared to the threshold level :

1- $\Sigma p < S$ quantitative traits are then analysed.

2- $\Sigma p =$ (or $>$) S the candidate variety is considered as distinct from the reference variety.

Quantitative traits

Time of ear emergence and height are used only if measurements were registered the same year at the same location.

Means comparisons are done (Newman Kheuls, Scheffe contrasts)

Varieties which are similar (qualitative and quantitative traits) will be cultivated in the field side by side.

NL: Based on the Technical Questionnaire and other information from the breeder (formulas of crossings etc) the determination of reference varieties is done by hand - as we have a relatively small reference collection only. (Bigger collections like our collections for grasses are screened/grouped with the help of a computer program). Selection is based on the main characteristics (seasonal type, grain characteristics like: rachilla hair type and hairiness of the ventral furrow and number of rows in the ear). From the second year varieties are grouped based on the first year's results.

NZ: If the breeder claims the candidate variety has, for example, late time of ear emergence, then all barley varieties with medium to very late time of ear emergence will be included in the test – only those known to have very early or early ear emergence will be excluded from the test. If the breeder claims the candidate has medium time of ear emergence, only those known to have very early or very late ear emergence will be excluded. A new variety that becomes available commercially will always be included in the test as there is usually very little reliable descriptive information about these varieties.

SK: All varieties are in the database. The computer program compares the descriptions and then it chooses the most similar varieties.

- UK:
- Test Year 1
- Grouping method
- Candidate variety is grown alongside the most similar variety cited by the applicant on then TQ and/or grown in a “group” of other varieties sharing the same UPOV grouping characters given on the TQ.
- The candidate variety may be grown next to its female parent variety in a group as above.
- The morphological characters in the UPOV guidelines for barley are recorded by field observations on the plots and from laboratory examinations of representative harvested sub-samples to create a Test Record based on the UPOV numerical states for each character. (These observations and examinations are also part of the test for Uniformity.)
- These Test Records are put onto a data base of reference collection variety descriptions which contains all candidates and varieties in Question 2 above.
-
- Test Year 2
- Screening Method
- The Test Records of the candidate varieties from the first year of DUS tests are compared to each other and to the reference collection of variety descriptions. Candidate varieties that cannot be distinguished are grown next to any non-distinct varieties or the most similar.
The UPOV morphological characters are routinely recorded in the second DUS test year as in the first year.
- The second set of Test Records are entered onto the data base. These are compared to the first Test Records; the records are checked for errors and inconsistencies. The character scores are averaged to produce a Variety Description based upon the two DUS test years.
- The Variety Descriptions of the candidate varieties are then compared to each other and to the variety descriptions of the reference collection varieties on the computer data base.
- A difference of 1 for grouping characters and 2 or 3 (“minimum distance”) for non-grouping characters is used to distinguish varieties.
- If the new (candidate) variety is not distinct based upon this sequence the following procedure is carried out to confirm distinctness in consultation with the National Office:
- all characters in the current UPOV Test Guidelines for barley are compared to establish Distinctness;
- if not clearly distinct the National Office is informed;
- the applicant is consulted for advice on character differences; any suggestions are checked for confirmation by the Examination Office;
- the new variety is compared with the non-distinct reference variety(ies) using the remaining characters on the UK National Test Guidelines for barley;
- if no differences are found the candidate variety is declared not distinct;
- if differences are observed but are not considered sufficient to make the candidate variety clearly distinct the National Office is consulted for approval to conduct an electrophoresis test;
- subject to the agreement of the applicant an electrophoresis test is carried out according to the current UPOV Test Guidelines for barley.
- if electrophoresis is inconclusive the candidate variety may proceed into:

(cont. on next page)

- | |
|---|
| <ul style="list-style-type: none"> • 1. a third DUS test year to resolve Distinctness; this test year may involve growing the candidate in side-by-side cultivated field plots with the non-distinct varieties; • 2. a special test to examine claims made by the applicant e.g. disease resistance/susceptibility • 1 and 2 are subject to the agreement of the National Office and the applicant. • The results for Question 12.2 are given as if the two candidates, Variety 1 and Variety 2, have completed DUS tests and distinctness has been assessed using the final elaborated description. • Variety 1 was found to be DISTINCT • Variety 2 was found to be NOT DISTINCT from spring barley Century |
| <ul style="list-style-type: none"> • ZA: Not applicable. |

Summary of empirical survey on the composition of the reference collections of spring barley

Two candidates' varieties have been selected

Variety 1 - one well-known variety registered in several countries.

Variety 2 - one 1998-registered variety. Furthermore, the information given by the breeder at the time of application (TQ) and the elaborated description are enclosed.

Please list all varieties of the Questions 12.1 and 12.2 in the enclosed spreadsheet. One variety pr. question equalises one record (one line in the spreadsheet). Please use only upper case letters in the "answers" spreadsheet.

Question 12.1

Please list all varieties of the current collection of barley in your country (spring barley)

Question 12.2

List the varieties which are grown or planned to grow in the field to establish distinctness in relation to Variety 1 and 2. The selection of varieties can be based either on the information provided by the applicant (technical questionnaire) and/or on the final elaborated description

QUESTION 12.1

From all received varieties (candidates (CV), national reference (NRV) and foreign reference varieties (FRV)) a unique variety identifier is created. All different varieties are counted (793 varieties) and in Table 1 (below) the number of varieties represented in 1, 2, 3, 4, 5, 6 or 7 countries are shown.

Table 1: Number of varieties mentioned in 1, 2, 3, 4, 5 or 6 countries

Varieties included in reference collection(s) of	Number of varieties (CV, NRV & FRV)	Number of varieties (only CV)
1 country	542	294
2 countries	156	21
3 countries	54	3
4 countries	23	1
5 countries	12	
6 countries	5	
7 countries	1	
Total	793	319

542 varieties are present in the reference collection of only one country (68%), 156 varieties in 2 countries and so on. One variety is present in the reference collection of 7 countries (Barke). No variety is present in the reference collection of more than 7 countries. By doing the same counting only for the candidate varieties the figures show that 294 varieties are present in only one country (equal to 92 %), 21 varieties in 2 countries, 3 varieties in 3 countries and only one variety in 4 countries (CSBA 5138-2). No candidate variety is present in more than 4 countries.

Table 2: Summary of the size and composition (CV, NRV and FRV) of the national reference collection in relation to the national reference collection and in relation to all varieties

	Number of varieties in national reference collections				% varieties of nat ref-col			Total ref-col	% varieties out of all varieties in reference collections in 10 countries (total "reference collection")			
	Ref-col	CV	NRV	FRV	CV	NRV	FRV		ref-col	CV	NRV	FRV
AR	32	.	32	.	.	100	.	793	4	.	4	.
AT	101	50	40	11	50	40	11	793	13	6	5	1
DE	144	85	48	11	59	33	8	793	18	11	6	1
DK	245	38	54	153	16	22	62	793	31	5	7	19
FR	366	63	150	153	17	41	42	793	46	8	19	19
NL	49	3	34	12	6	69	24	793	6	0	4	2
NZ	12	.	9	3	.	75	25	793	2	.	1	0
PT	11	.	4	7	.	36	64	793	1	.	1	1
RU	82	45	37	.	55	45	.	793	10	6	5	.
UK	163	65	70	28	40	43	17	793	21	8	9	4

A full summary of the size and composition of the national reference collections of all countries is given in Table 2. In the second column the total number of varieties in the

national reference collection of the individual member State is given. Columns 3 to 5 give the number of varieties grouped by variety type (CV=candidate variety, NRV=national reference variety, FRV=foreign reference variety) of each member State. In columns 6-8 the relative distribution in percent of the CV, NRV and FRV in relation to the size of the national reference collection is given. In column 9 the total number of varieties (“reference collection”) of all answering countries is given. Finally the relative distribution (percent) of the sum of all three types of varieties (national reference collection) and the number of CV, NRV, FRV of each member state in relation to the total “reference collection” is given.

The size of the national reference collection varies between 11 (PT) and 366 (FR) varieties. As an average of all member States the national reference collection has a size of about 120 varieties. Only 4 out of 10 countries are above this mean size. The number of varieties in testing varies from no application (AR, NZ, PT) over 3 (NL) varieties up to 85 varieties (DE).

The amount of foreign reference varieties in relation to the national reference collection is for most countries at a very low level. Except from DK, FR and PT the share of FRV in relation to the size of the national reference collection is below 30 %. For PT the high ratio is a consequence of the very small size of the national reference collection (11 varieties). The share of RV in relation to the total reference collection is very low. Only DK and FR have a share of FRV of more than 10 %. The volume of the national reference collection in relation to the total reference collection is greatest in FR (46 %).

Table 3: Summary of the size of the 'reference collection' between two member States, the number of varieties in common between two member States and the relative number of common varieties between two member States in percent (CV, NRV and FRV).

Country	AR	AT	DE	DK	F	NL	NZ	PT	RU	UK
Total of varieties in the reference collections between two member States										
AR	.	127	173	271	392	78	44	42	113	193
AT	127	.	223	307	435	140	110	107	178	250
DE	173	223	.	339	465	181	154	153	223	276
DK	271	307	339	.	468	268	255	253	323	345
F	392	435	465	468	.	385	373	370	445	458
NL	78	140	181	268	385	.	61	60	131	196
NZ	44	110	154	255	373	61	.	23	94	173
PT	42	107	153	253	370	60	23	.	93	172
RU	113	178	223	323	445	131	94	93	.	244
UK	193	250	276	345	458	196	173	172	244	.
mean:										225
Number of varieties in the intersection of the reference collection of two member States										
AR	.	4	3	6	6	3	0	1	1	2
AT	4	.	20	37	30	8	1	3	3	12
DE	3	20	.	50	45	12	2	2	3	31
DK	6	37	50	.	143	26	2	3	4	63
F	6	30	45	143	.	30	5	7	3	71
NL	3	8	12	26	30	.	0	0	0	16
NZ	0	1	2	2	5	0	.	0	0	2
PT	1	3	2	3	7	0	0	.	0	2
RU	1	3	3	4	3	0	0	0	.	1
UK	2	12	31	63	71	16	2	2	1	.
mean:										15
% varieties in the intersection of the reference collection of two member States in relation to the reference collection of the member States in question										
AR	.	3	2	2	2	4	0	2	1	1
AT	3	.	9	12	7	6	1	3	2	5
E	2	9	.	15	10	7	1	1	1	11
DK	2	12	15	.	31	10	1	1	1	18
F	2	7	10	31	.	8	1	2	1	16
NL	4	6	7	10	8	.	0	0	0	8
Z	0	1	1	1	1	0	.	0	0	1
PT	2	3	1	1	2	0	0	.	0	1
RU	1	2	1	1	1	0	0	0	.	0
UK	1	5	11	18	16	8	1	1	0	.
Mean of intersection i procent (CV, NRV, FRV):										4.6
Mean of intersection i procent (NRV, FRV):										6.2

The summary of Table 3 is a hypothetical aspect in relation to the composition of the reference collection. Suppose UPOV only consists of two member States, in that case the theoretical reference collection is the union of the 'known' varieties of both member States. In Table 3 the counting of varieties in pairs of member States is done. The average size of all pairs of member States is 225 varieties in total and 15 varieties in the intersection. The average of common varieties between two member States (intersection) in relation to the theoretical size of the reference collection of the two member States (union) in question is 4.6 %.

In Table 3 the counting is done on the basis of all types of varieties (CV, NRV and FRV). If the same counting is done only on the basis of the NRV and FRV, thus eliminating the CV, the average of the intersection is 6.2 %. The highest number of varieties in the intersection is found between DK and FR (143 varieties out of 468 varieties, equal to 31%). From the 143 varieties in common only 2 varieties are candidate varieties.

In Table 3 it is possible to evaluate the difference between the reference collections within and between geographical regions. The number of varieties in the intersection between AR, NZ and RU and the countries of the European Union is quite low, but within the countries of the European Union the number of varieties in the intersection is only slightly higher. Russia as a new member State of UPOV is aware of this problem (stated in their reply to Question 7), but none of the “older members” have included the Russian varieties in their reference collection. It is possible to evaluate the varieties in the intersection between two countries in the Annex to this document.

Table 4: Countries including the questioned varieties in their national reference collection

Variety		Countries
1	Alexis	AT, DE, DK, FR, PT, UK
2	Century	DK, FR, UK

Only six countries (AT, DE, DK, NL, NZ and RU) answered this question on the basis of the information coming from the technical questionnaire. The aim of Question 12.2 (technical questionnaire (TQ)) is to evaluate the completeness of the reference collection and the efficiency of desk research, grouping and pre-screening.

In Table 4 the countries including Variety 1 (Alexis) and 2 (Century) in their national reference collection are listed. In Table 5 the result of the grouping based on the information given by the TQ is shown. First of all Table 5 shows the efficiency of the grouping characteristics as they reduce the relevant reference collections. But as stated by countries in their answers to Questions 1 to 11 these characteristics have no reducing effect as applications in both groups (mostly the case) forces the DUS-performing authority to establish trials including all varieties of all groups. Variety 1 (Alexis), as one of the biggest malting barleys of the last decade, is included in the reference collection as a similar variety Variety 2 (Century), which is less widely distributed, is only selected by one answering country.

QUESTION 12.2

Table 5: Number and composition of the similar varieties based on the *technical questionnaire* and the size of the reference collection of the answering countries

	RC	% of NAT.RC	CV	FRV	NRV	REF.COL
Variety 1						
AT*	78	77	35	9	34	389
DE*	127	88	78	11	38	389
DK*	220	89	34	138	48	389
NL	27	55	3	13	11	389
NZ	9	75	.	1	8	389
RU	27	33	11	.	16	389
Variety 2						
AT	13	13	11	1	1	73
DE	12	27	5	2	5	73
DK**	25	10	4	15	6	73
NL	27	55	3	13	11	73
NZ	5	42	.	5	.	73

* Alexis included in the national reference collection

** Century included in the national reference collection

Table 6: Number and composition of the similar varieties based on the *official elaborated description* and the size of the reference collection of the answering countries

	RC	% of NAT.RC	CV	FRV	NRV	REF.COL
Variety 1						
DK*	220	89	34	138	48	288
FR*	129	35	14	43	72	288
NL	27	55	3	13	11	288
PT	4	36	.	4	.	288
UK***	NC					
Variety 2						
DK**	25	10	4	15	6	54
FR**	4	1	.	2	2	54
NL	27	55	3	13	11	54
PT	3	27	.	3	.	54
UK**	ND (1)					

* Alexis included in the national reference collection and selected

** Century included in the national reference collection and selected

*** Alexis included in the national reference collection and not selected

Question 12.2 based on the official description is only answered by DK, FR, NL, PT and partly UK. The aim of this question is to evaluate the efficiency of the state of harmonisation of the official descriptions. The description of Variety 1 (Alexis) is produced by DK and the British authorities produced the description of Variety 2 (Century).

In the French reply Alexis together with 128 varieties was selected as similar varieties to Variety 1 (Alexis). Furthermore Century was selected together with 4 varieties as similar varieties to Variety 1 (Century). By using the French system it seems as if all relevant reference varieties are included in the growing test. Neither NL nor PT have included Alexis or Century in their national reference collection and due to this not selected them as similar varieties.

Several other countries found the case of selecting the similar varieties according to the elaborated UPOV description to be unrealistic, and unfortunately due to this fact did not answer this question. For this reason a clear comparison between the efficiency of desk research, grouping and prescreening based on either the information of the TQ or the elaborated descriptions is not possible.

Conclusion on Question 12:

Thanks to all answering countries. Without their efforts there would have been no clear conclusions. But the quality of the information and conclusions could be increased further by the input of more member States answering the questions. Furthermore a full answer of Question 12.2 by all member States would give a good base for a solid conclusion.

- No country systematically has the candidate varieties of other countries included in the barley national reference collection. 92 percent of the candidate varieties are only present in one country.
- In most of the answering countries the composition of the barley reference collection is mainly restricted to a national system including the CV and NRV and only a restricted number of FRV. These FRV are selected when the varieties are certified or somehow distributed in the country (offered for sale or disposed). 68 percent of the included varieties are only present in one country.
- In relation to the TC/36/7 page 31 last paragraph (see page 1), it is clear that UPOV must propose solutions for the effective constitution and management of reference collections.
- The harmonisation of the descriptions between countries based on the UPOV Test Guidelines can not clearly be concluded as only a few countries tried to answer the Question 12.2 based on the information given by an official description. Further investigations in this area seem to be necessary.
- Moreover the answers of Question 12.2 based on the TQ contra the description are not clearly comparable as different countries answered based on the TQs and the descriptions of Variety 1 and 2.

ANNEX

Annex**Common reference varieties between AR and AT**

BARKE	MARINA	OTIS	SCARLETT
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Common reference varieties between AR and DE

BARKE	OTIS	SCARLETT
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Common reference varieties between AR and DK

BARKE	GOLDIE	MAUD	OTIS	SCARLETT
VOLGA				

Common reference varieties between AR and F

BARKE	GOLDIE	MAUD	OTIS	SCARLETT
VOLGA				

Common reference varieties between AR and NL

BARKE	DELITA	MAUD
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Common reference varieties between AR and PT

OTIS

Common reference varieties between AR and RU

SCARLETT

Common reference varieties between AR and UK

BARKE	VOLGA
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Common reference varieties between AT and DE

ALEXIS	APEX	BARKE	BRITTA	CSBA 5138-2
DANUTA	DERKADO	EUNOVA	HELLANA	KRONA
MARESI	MELTAN	OHARA	ORTHEGA	OTIS
PENELOPE	SCARLETT	STEFFI	STRG 675.99	THURINGIA

Common reference varieties between AT and DK

ALEXIS	ALPINA	AMALIA	APEX	ATEM
BARKE	BESSI	BONAIRE	BRITTA	CSBA 5138-2
CYTRIS	DERKADO	DITTA	EBRA	EFFEKTA
ELISA	EUNOVA	EXTRA	HELLANA	KRONA
MAGDA	MARESI	MELTAN	OHARA	ORTHEGA
OTIS	PANORAMA	PENELOPE	PRISMA	SANTIAGO
SCARLETT	SECURA	SELECTA	SIGNAL	STEFFI
THURINGIA	VIDEO			

Common reference varieties between AT and F

ALEXIS	APEX	ATEM	BARKE	BERTA
BONAIRE	BRITTA	CARINA	CARMEN	CM 4016
DERKADO	DITTA	EBRA	EUNOVA	KRONA
MAGDA	MARESI	MELTAN	OHARA	ORTHEGA
OTIS	PENELOPE	PRISMA	PROSA	S 3482
SCARLETT	SECURA	SELECTA	THURINGIA	VIVA 1

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Common reference varieties between AT and NL

APEX	A TEM	BARKE	BONAIRE	MAGDA
NSL 94-4109	PRISMA	VIDEO		

Common reference varieties between AT and NZ

DERKADO

Common reference varieties between AT and PT

ALEXIS	CARINA	OTIS
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Common reference varieties between AT and RU

SCARLETT	SIGNAL	THURINGIA
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Common reference varieties between AT and UK

ALEXIS	A TEM	BARKE	BONAIRE	CHERI
CM 4016	CSBA 5138-2	DERKADO	MELTAN	PRISMA
STEFFI	SW 1656			

Common reference varieties between DE and DK

ALEXIS	ANNABELL	APEX	ASPEN	BACCARA
BARKE	BARONESSE	BRENDA	BRITTA	CHALICE
CHANTAL	CHARIOT	CHARLOTTE	CSBA 5138-2	DERKADO
EUNOVA	EXTRACT	HALLA	HANKA	HELLANA
HENNI	KRONA	MADEIRA	MADONNA	MARESI
MELTAN	NEVADA	OHARA	OPTIC	OPTIMA
ORTHEGA	OTIRA	OTIS	PASADENA	PEGGY
PENELOPE	PONGO	PROLOG	RIA	RICARDA
RIVIERA	SALLY	SALOON	SCARLETT	SIGRID
SISSY	STEFFI	TENERE	THURINGIA	VISKOSA

Common reference varieties between DE and F

ALEXIS	ANNABELL	APEX	ASPEN	AURA
BACCARA	BARKE	BARONESSE	BRENDA	BRITTA
CHALICE	CHARIOT	DERKADO	EUNOVA	EXTRACT
GESINE	HALLA	HANKA	HENNI	KRONA
MADONNA	MADRAS	MARESI	MELTAN	MINNA
NERUDA	NEVADA	NSL 97-4182	OHARA	OPTIC
ORTHEGA	OTIRA	OTIS	PENELOPE	PONGO
PROLOG	RIVIERA	SALOON	SCARLETT	SIGRID
SISSY	SW 1562	SW 1905	SW 2063	THURINGIA

Common reference varieties between DE and NL

APEX	ASPEN	BARKE	BRENDA	CHALICE
EXTRACT	HANKA	MADONNA	NFC 497-16	SALOON
SEMU 12351	SW 1562			

Common reference varieties between DE and NZ

DERKADO	OPTIC
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Common reference varieties between DE and PT

ALEXIS	OTIS
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Common reference varieties between DE and RU

ANNABELL SCARLETT THURINGIA

Common reference varieties between DE and UK

5509 A	ALEXIS	ANNABELL	ASPEN	AURA
BARKE	BARONESSE	CHALICE	CHARIOT	CSBA 5138-2
DERKADO	DSV 70508	DSV 70524	EXTRACT	MELTAN
NERUDA	NFC 498-39	NFC 498-45	NFC 498-46	OPTIC
OTIRA	PONGO	RICARDA	RIVIERA	SALOON
STEFFI	SW 1562	SW 1650	SW 2063	TAIGA
VISKOSA				

Common reference varieties between DK and F

ADOUR	AISLING	ALANIS	ALEXIS	ALIZE
ALLIOT	ALPRIS	ANISA	ANNABELL	APEX
ARAMIR	ARAVIS	ARDILA	ARIEL	ASPEN
ASTORIA	ATEM	BACCARA	BARKE	BARLETA
BARONESSE	BARTOK	BEBOP	BERENICE	BIZET
BLENHEIM	BONAIRE	BOND	BRENDA	BREWSTER
BRITE	BRITTA	CAMEO	CAMINANT	CANASTA
CARESSE	CARLOTA	CARUSO	CECILIA	CELINKA
CENTURY	CERES	CHALICE	CHAMANT	CHAPKA
CHARIOT	CHASER	CITY	COOPER	CORELLI
CORK	DANDY	DEBORAH	DELIBES	DERKADO
DITTA	DOUCHKA	EBRA	ENIGMA	ETNA
EUNOVA	EXTRACT	FERMENT	FLIKA	FORMULA
GANT	GOLDIE	GOLF	GRAPHIC	GUNILLA
HALLA	HANKA	HENNI	HERON	HIND
JERSEY	KRONA	LAMBA	LIMBO	LINDEN
LINUS	LUBERON	LUX	LUZON	LYSIBA
MADONNA	MAGDA	MARESI	MAUD	MELTAN
MENTOR	MODEL	NEVADA	OHARA	OMEGA
OPTIC	ORCIVALE	ORMALT	ORTHEGA	ORTOLI
OTIRA	OTIS	PALOMA	PENELOPE	PERNILLA
PHILADELPHIA	PODIE	POLYGENA	PONGO	POTTER
PRISMA	PROLOG	PUCCINI	PYRAMID	RAGTIME
REGGAE	RIVIERA	SABEL	SALOON	SCARLETT
SECURA	SELECTA	SIGRID	SISSY	SULTANE
TACTIC	TANKARD	TAVERN	TEXANE	THURINGIA
TIRUP	TOFTA	TREBON	TREMOIS	TRIANON
TROIKA	TYNE	TYRA	VINTAGE	VODKA
VOLGA	WHOPIE	WREN		

Common reference varieties between DK and NL

APEX	ARAMIR	ARDILA	ASPEN	ATEM
BARKE	BONAIRE	BRENDA	CHALICE	EXTRACT
GOLF	HANKA	LUZON	MADONNA	MAGDA
MAUD	OMEGA	PRESTIGE	PRISMA	QUARTET
RAGTIME	REGGAE	RIFF	SALOON	TANKARD
VIDEO				

Common reference varieties between DK and NZ

DERKADO OPTIC

Common reference varieties between F and UK

7251 Y2	945730	ALEXIS	ALLIOT	ANNABELL
ARAMIR	ASPEN	ASTORIA	ATEM	AURA
AUTO	BARKE	BARONESSE	BIZET	BLENHEIM
BONAIRE	BREWSTER	CAMEO	CEBECO 9982	CECILIA
CELLAR	CENTURY	CERES	CHALICE	CHARIOT
CHASER	CM 4016	COLADA	COOPER	CORK
COUNTY	DANDY	DELIBES	DERKADO	EXTRACT
FELICIE	FERMENT	FONTANA	GOLF	GRAPHIC
GRIT	ICARE	KLAXON	LINDEN	LINUS
MELTAN	MENUET	MICHKA	NERUDA	NOMAD
NSL 96-2701	NSL 97-2284	NSL 98-4087	OPTIC	OTIRA
PONGO	POTTER	PRISMA	RIVIERA	SALOON
STATIC	SW 1562	SW 1965	SW 2063	TABORA
TANKARD	TAVERN	TEO	TRIUMPH	TYNE
VOLGA				

Common reference varieties between NL and UK

ARAMIR	ASPEN	ATEM	BARKE	BONAIRE
CHALICE	EXTRACT	GOLF	GRIT	MENUET
PRESTIGE	PRISMA	QUARTET	SALOON	SW 1562
TANKARD				

Common reference varieties between NZ and UK

DERKADO	OPTIC
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Common reference varieties between PT and UK

ALEXIS	MICHKA
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Common reference varieties between RU and UK

ANNABELL

[End of Annex and of document]