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RESULTS OF THE QUESTIONNAIRE ON ROOTSTOCKS

collected by the Office of the Union

As agreed during the last session of the Technical Working Party for Fruit Crops, the Office of UPOV prepared with Circular U 2414 a questionnaire on rootstocks. The present document reproduces the summary of the answers received.

RESULTS ON THE QUESTIONNAIRE ON THE PREPARATION OF TEST GUIDELINES FOR ROOTSTOCK VARIETIES

Question 1: How many varieties or applications for rootstock varieties are in your country?

Species	Propagation and Pollination	Number of Applications Received for Rootstock Varieties /Total Number of Rootstock Varieties								
		AU	DE	FR	GB	JP	NL	NZ	SE	ZA
Apple	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		10/8 0/2	12/12	0/8	6/9	0/3+4 non prot.	4/4		3/11
Grape	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		9/2		0/0	0/4				8/44
Pear	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		4/0 0/2	6/6 pyrus	0/0	 0/2 0/2	0/4 non prot. seedl.			2/8
Plum	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		3/6 0/1	11+7/28 1/19 0/2 prunus	0/0	1/2 0/1 0/1	1+4 non prot.	1/1		3/6
Walnut	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated			2/0 juglans 0/3+3 0/3	0/0	0/0 0/2 0/2	0/0			
Other	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	3/3 cherry	5/9 cherry 0/2	1/1 cydon.	0/0	4/6+1/3 cherry+ peach	1+2 non prot. 0/1	1/1+1/1 cherry + kiwifr.	34/5 apple pear plum	3/3guava 0/8citrus 2/2olive 0/4S.cher. 0/4peach 0/2quince 1/1pea/alm 1/1pl/pea all veg.

Question 2: For which of the following species do you apply separate Test Guidelines (separate lists of characteristics) for rootstock varieties (separ. rootst.), for which do you apply the Test Guidelines for fruit varieties (amend. fruit) (if needed with additional characteristics)?

Species	Propagation and Pollination	Number of Applications Received for Rootstock Varieties /Total Number of Rootstock Varieties							
		AU	DE	FR	GB	JP	NL	NZ	ZA
Apple	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		separ. rootst.	amend. fruit proj. separ. rootst.	amend. fruit	amend. fruit	no test	amend. fruit	amend. fruit
Grape	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		amend. fruit						amend. fruit
Pear	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		separ. rootst.	amend. fruit proj. separ. rootst.	separ. rootst. but not tested			amend. fruit	amend. fruit
Plum	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated		separ. rootst.+ separ. rootst.	separ. rootst.	separ. rootst. but not tested	amend. fruit		amend. fruit	amend. fruit
Walnut	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated			TG fruit					
Other	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	amend. fruit	amend. fruit. cherry	TG fruit	amend. fruit	amend. fruit cherry+ peach		amend. fruit cherry separ. rootst kiwifr.	guava fruit citrus fruit olive am.fruit S.cher. am.fruit peach am.fruit quince am.fruit peach/alm sep. r. plum/peach sep. r. all veg.

Question 3: Which general problems do you foresee if each of the possible solutions mentioned above would be adopted?

Solution (a): <u>Amended</u> Fruit Test Guidelines	**GENERAL PROBLEMS FORESEEN**
– All species	AU: May not be applicable for non-fruiting species. FR: Rootstock varieties should be systematically added to the fruit Test Guidelines if existing. JP: Difficult to detect distinctness. In general, the variations in characteristics of rootstock varieties are relatively smaller than that of fruit varieties. Therefore, if the existing Test Guidelines for fruit varieties are adopted to rootstock varieties, certain characteristics would be categorized within one same note and we cannot say these are sufficiently distinguishable. Meanwhile, because of the lack of the data on the range of variations in rootstock varieties, it will be quite difficult to prepare separate Test Guidelines for rootstock varieties and to select the example varieties.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. GB: Overloaded document NL: None. NZ: None. ZA: For example varieties the TGs would become too large and clumsy.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used only for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. ZA: Difficulties experienced with example varieties.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Cydonia is a rootstock in NL. NZ: None.
– Plum	DE: Insufficiently clear in the use of the TGs, the attribution of example varieties would have to be done separately for each group of species or species hybrid. NL: Rootstock species might be different from fruit bearing species (P. mahaleb). NZ: Some species are not covered (cherry). ZA: What about species which are not covered?
– Walnut	

– Other species (specify)	DE: Cherry: insufficiently clear in the use of the TGs, the attribution of example varieties would have to be done separately for each group of species or species hybrid. NZ: None (peach). ZA: Citrus: wait until it becomes important. ZA: Guava + avocado: fruit TGs are o.k.
Solution (b): <u>Parallel</u> Fruit and Rootstock Test Guidelines	
– All species	AU: Many characteristics may be duplicated. JP: Difficult to prepare TGs.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. FR: Yes. GB: Could be o.k. NL: None. NZ: None ZA: Although example varieties differ, almost the same characteristics are duplicated.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used only for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. ZA: Although example varieties differ, almost the same characteristics are duplicated.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. FR: Yes. NL: Guidelines for Cydonia. NZ: None. ZA: Although example varieties differ, almost the same characteristics are duplicated.
– Plum	DE: This is at present the proposed solution in DE, but with the increase of the number of varieties inside, one or the other species or species crossing solution (e) will have to be used. FR: Yes. NL: Different rootstock species. NZ: Some species not covered (cherry). ZA: What about species not covered?
– Walnut	FR: Yes.

– Other species (specify)	DE: Cherry: this is at present the proposed solution in DE, but with the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. FR: New TGs should be prepared for P. mahaleb, P. cerasus, P. cerasifera, juglans, quince and Prunus interspecific hybrids. ZA: Citrus:solution (c) better once (a) insufficient. ZA: Guava + avocado: not necessary, rootstock varieties are similar to fruit varieties.
Solution (c): <u>Amended</u> Test Guidelines and Rootstock Test Guidelines for Selected Species	
– All species	AU: Probably the best solution. GB: Overloading document. JP: Difficult to detect distinctness.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. FR: No. NL: None (complicated, much paper). NZ: Unnecessary. ZA: This solution works well in ZA.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used exclusively for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. FR: No. ZA: This solution works well in ZA.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. FR: No. NL: None (complicated, much paper). NZ: None, should cover quince. ZA: This solution works well in ZA.
– Plum	FR: No. NL: None, good solution. NZ: Could cover important species (cherry). ZA: This solution works well in ZA.
– Walnut	FR: No.

– Other species (specify)	DE: Prunus domestica, P. avium, P. cerasus: DE: insufficiently clear in the use of the TGs, the attribution of example varieties would have to be done separately for each group of species or species hybrid. NZ: None, could be useful (Actinidia). ZA: Citrus: may become necessary later, some rootstock varieties can be tested under the fruit TGs, but others are very different. ZA: Guava + avocado: not necessary.
Solution (d): <u>Parallel</u> Fruit and Rootstock Test Guidelines and one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	AU: Having a "rest TG" of the genus is probably too general, difficult if one characteristic applicable to one species but not to another. FR: Each time the rootstock cannot be described with the fruit TGs separate rootstock TGs are necessary. JP: Difficult to detect distinctness and to select example varieties.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Not necessary. NZ: Unnecessary, too complex. ZA: Not practical.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used exclusively for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. ZA: Not practical.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Not necessary. NZ: Too complex. ZA: Not practical.
– Plum	DE: Insufficiently clear in the use of the TGs, the attribution of example varieties would have to be done separately for each group of species or species hybrid. NL: Too many species. NZ: Too complex.
– Walnut	

– Other species (specify)	DE: Cherry: insufficiently clear in the use of the TGs, the attribution of example varieties would have to be done separately for each group of species or species hybrid. ZA: All Prunus: the genus is too large to cover everything and the area covered by the description will be too broad, provisions for broad spectrum have to be made, too many example varieties are needed, e.g. long leaf for plum is not long for apricot, has to be split for description. ZA: Citrus: genus is too large. ZA: Guava + avocado: not necessary.
Solution (e): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Selected</u> Species	**GENERAL PROBLEMS FORESEEN**
– All species	AU: Too many Test Guidelines. GB: Best option, especially where there are many different species as in Prunus and Citrus. JP: Difficult to prepare TGs. NL: Only in species where <u>different</u> <u>species</u> are used for rootstock purposes parallel TGs could be taken into consideration, otherwise amended fruit/rootstock TGs are preferable.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Not necessary. NZ: Too complex. ZA: Solution (c) preferable.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used exclusively for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. ZA: Solution (c) preferable.
– Pear	DE: solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Not necessary. NZ: Too complex. ZA: Solution (c) preferable.
– Plum	DE: No special problems, this is at present the proposed solution in DE, but with the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. NL: Could be a solution. NZ: Too complex. ZA: Solution (c) preferable.
– Walnut	
– Other species (specify)	DE: Cherry: no special problems, this is at present the proposed

	solution in DE, but with the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. ZA: Citus: solution (c) preferable once required. ZA: Guava + avocado: not necessary.
Solution (f): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	JP: Difficult to prepare TGs and to select example varieties.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: Not necessary. NZ: Too complex.
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used exclusively for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: not necessary. NZ: Too complex.
– Plum	DE: This is at present the proposed solution in DE, but with the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. NL: How many species are involved? NZ: Too complex. ZA: Genus too large to cover.
– Walnut	
– Other species (specify)	DE: Cherry: this is at present the proposed solution in DE, but with the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. ZA: Citus: genus too large and varied. ZA: Guava + avocado: not necessary.
Solution (g): <u>One Single Rootstock</u> Test Guidelines Document for Whole Genus	

– All species	AU: Too general. GB: Not suitable for genera with several species used as rootstock varieties. JP: Difficult to detect distinctness.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: ? NZ: Too complex ZA: Genus too large to cover
– Grape	DE: The present TGs are sufficient, only about 5% of the characteristics are used exclusively for fruit varieties or only for rootstock varieties, some rootstock varieties also produce fruits and the number of rootstock varieties is relatively small compared to that of fruit varieties. ZA: Genus too large.
– Pear	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. NL: ? NZ: Too complex. ZA: Genus too large.
– Plum	DE: This is the present practice in DE, but the present TGs have already to be split into two TGs: (a) TGs for plum rootstocks covering Prunus cerasifera, Prunus tomentosa, Prunus belsiana x (Prunus cerasifera x Prunus persica), Prunus domestica and Prunus solicina x Prunus cerasifera) x Prunus spinosa. (b) TGs for cherry rootstocks covering Prunus mahaleb, Prunus avium, Prunus cerasus, Prunus fruticosa x Prunus cerasus, Prunus cerasus x Prunus canescens, Prunus fruticosa x Prunus avium, Prunus pseudocerasus x (Prunus canescens x Prunus incisa), Prunus canescens x Prunus tomentosa, Prunus avium x (Prunus canescens x Prunus tomentosa) and Prunus incisa x Prunus serrula. With the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. NL: Will not work NZ: Too complex ZA: Genus too large to cover
– Walnut	
– Other species (specify)	DE: Cherry: this is the present practice in DE, but the present TGs have already to be split into two TGs. With the increase of the number of varieties inside one or the other species or species crossing solution (e) will have to be used. ZA: Citrus: genus too large and varied ZA: Guava + avocado: not necessary

Question 4: What would be the effect on the testing of uniformity?

Solution (a): <u>Amended</u> Fruit Test Guidelines	**EFFECT ON UNIFORMITY**
– All species	FR: Very bad JP: No problems for vegetatively propagated varieties. Seed propagated varieties which tend to have broader variations in characteristics would often be regarded as not sufficiently uniform, but no applications received so far. ZA: No effect as in ZA all are vegetatively propagated. NL: The Table of Characteristics has nothing to do with uniformity. The same table is used for clones, self-fertilized or cross-fertilized varieties. In ornamentals + fruits uniformity is first observed on the whole sample (all plants) and on all characteristics, not only on those in the TGs. The only reason not to use certain characteristic in cross-fertilized varieties is not that it could be too variable but that it cannot be described (e.g. color). DE: Testing of uniformity does not depend on the TGs but on the rules for the judgment of uniformity depending on the method of propagation which have to be laid down in the general part of the TGs (layout, sample size, recording, observation of off types, of variation, uniformity tolerance). The effect on uniformity starts when the TGs are incomplete (e.g. no generative characteristics). The form of the TGs may affect the testing of uniformity; in large collections testing is only done inside one species or species hybrid for which special TGs should be prepared. GB: The form of the TGs has no effect on uniformity.
– Apple	NZ: None. DE: In DE only vegetatively propagated, thus no propels of uniformity, only vegetative characteristics observed.
– Grape	DE: Vine rootstock varieties are vegetatively propagated. In DE the fruit TGs are used.
– Pear	NZ: None. DE: In DE only vegetatively propagated, thus there are no problems of uniformity, only vegetative characteristics are observed.
– Plum	NZ: None. DE: With Prunus rootstock varieties vegetatively and generatively propagated varieties exist. In DE vegetative and generative characteristics are observed.
– Walnut	
– Other species (specify)	AU: Cherry: minimal. NZ: Peach, Actinidia: none. DE: Cherry: With Prunus rootstock varieties vegetatively and generatively propagated varieties exist. In DE vegetative and generative characteristics are observed.
Solution (b): <u>Parallel</u> Fruit and Rootstock Test Guidelines	

– All species	FR: Very bad. JP: Same as (a) (no problems for vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated.
– Apple	NZ: None, fruit characteristics could be useful.
– Grape	
– Pear	NZ: None, fruit characteristics could be useful.
– Plum	NZ: None, fruit characteristics could be useful.
– Walnut	
– Other species (specify)	AU: Cherry: minimal.
Solution (c): <u>Amended</u> Test Guidelines and Rootstock Test Guidelines for Selected Species	
– All species	FR: If necessary. JP: Same as (a) (no problems for vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated.
– Apple	NZ: None, fruit characteristics could be useful.
– Grape	
– Pear	NZ: None, fruit characteristics could be useful.
– Plum	NZ: None, fruit characteristics could be useful.
– Walnut	
– Other species (specify)	AU: Cherry: minimal.
Solution (d): <u>Parallel</u> Fruit and Rootstock Test Guidelines and one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	FR: Bad. JP: Same as (a) (no problems for vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated.
– Apple	NZ: None, fruit characteristics could be useful.
– Grape	
– Pear	NZ: None, fruit characteristics could be useful.
– Plum	NZ: None, fruit characteristics could be useful.
– Walnut	
– Other species (specify)	AU: Cherry: minimal.

Solution (e): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Selected</u> Species	**EFFECT ON UNIFORMITY**
– All species	JP: Same as (a) (no problem of vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated. NZ: Fruit, flower characteristics could be useful.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (f): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	JP: Same as (a) (no problem of vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated. NZ: Fruit, flower characteristics could be useful.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (g): <u>One Single Rootstock</u> Test Guidelines Document for Whole Genus	
– All species	JP: Same as (a) (no problem of vegetatively propagated species). ZA: No effect as in ZA all are vegetatively propagated. NZ: Fruit, flower characteristics could be useful.
– Apple	
– Grape	

– Pear	
– Plum	
– Walnut	
– Other species (specify)	

Question 5: What would be the effect on seed propagated varieties?

Solution (a): <u>Amended</u> Fruit Test Guidelines	**EFFECT ON SEED PROPAGATED VARIETIES**
– All species	ZA: No comment as in ZA all are vegetatively propagated. DE: Testing of uniformity does not depend on the TGs but on the rules for the judgment of uniformity depending on the method of propagation which has to be laid down in the general part of the TGs (layout, sample size, recording, observation of off types, of variation, uniformity tolerance). The effect on uniformity starts when the TGs are not complete (e.g. no generative characteristics). The form of the TGs may affect the testing of uniformity; in large collections testing is only done inside one species or species hybrid for which special TGs should be prepared. NZ: Prolong testing to wait for fruit/flowers. JP: Since seed propagating varieties tend to have broader variations in characteristics, they would be often regarded as insufficiently uniform, even though such variations are negligible in practical use as for rootstock varieties. It is difficult to make comments on this question because applications for seed propagating rootstock varieties have not been received so far.
– Apple	
– Grape	
– Pear	
– Plum	.
– Walnut	
– Other species (specify)	
Solution (b): <u>Parallel</u> Fruit and Rootstock Test Guidelines	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	

– Other species (specify)	
Solution (c): <u>Amended</u> Test Guidelines and Rootstock Test Guidelines for Selected Species	
– All species	NZ: None.
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	AU: Cherry: should include two generations.
Solution (d): <u>Parallel</u> Fruit and Rootstock Test Guidelines and one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (e): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Selected</u> Species	**EFFECT ON SEED PROPAGATED VARIETIES**
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	

Solution (f): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (g): <u>One Single Rootstock</u> Test Guidelines Document for Whole Genus	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	

Question 6: What would be the effect on sterile rootstock varieties or varieties not showing flowers or fruits or only after several years (e.g. only after five years)?

Solution (a): <u>Amended</u> Fruit Test Guidelines	**EFFECT ON STERILE ROOTSTOCK VARIETIES, LATE OR NO FLOWERING**
– All species	AU: It would be difficult to amend TGs to suit all situations. NL: Depends on amendments (have to be in the vegetative characteristics). NZ: Prolong testing or description would be incomplete. JP: Although it is considered necessary, also in DUS test of rootstock varieties, to examine the distinctness and uniformity of certain characteristics of flowers or fruits, it must be difficult to do so using any types of Test Guidelines proposed.
– Apple	DE: Solution (g) should be aimed at. Only few applications for rootstock varieties exist, thus the TGs for fruit varieties as also the TGs for rootstock varieties could cover the whole genus. ZA: No effect.
– Grape	DE: Generative characteristics are not observed and do not form part of the prerequisites for protection. They are thus also not part of the description. ZA: No effect.
– Pear	ZA: No effect.
– Plum	DE: The question does not depend on the form of the TGs (combined or separated according to species or species hybrids). In DE there are no sterile rootstock varieties. In case there are no flowers or fruits more vegetative characteristics should be observed. This should, however, not mean that the whole collection of rootstock varieties should only be observed on vegetative characteristics. ZA: No effect.
– Walnut	
– Other species (specify)	DE: Cherry: the question does not depend on the form of the TGs (combined or separated according to species or species hybrids). In DE there are no sterile rootstock varieties. In case there are no flowers or fruits more vegetative characteristics should be observed. This should, however, not mean that the whole collection of rootstock varieties should only be observed on vegetative characteristics. ZA: Citrus: may have to add more vegetative characteristics. ZA: Guava, avocado: all fruit normally.
Solution (b): <u>Parallel</u> Fruit and Rootstock Test Guidelines	
– All species	NL: No problems. NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species	

(specify)	
Solution (c): <u>Amended</u> Test Guidelines and Rootstock Test Guidelines for Selected Species	
– All species	NL: Depends on amendments (have to be in the vegetative characteristics). NZ: Prolong testing or description would be incomplete.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	AU: Cherry: essential characteristics would be on vegetative parts, good reason for keeping fruit TGs and rootstock TGs separate. ZA: Citrus: add more vegetative characteristics to separate TGs for selected species once it becomes necessary. No applications yet. ZA: Olives: take long to flower, but described on vegetative characteristics. If no difference was found, wait until flower.
Solution (d): <u>Parallel</u> Fruit and Rootstock Test Guidelines and one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NL: Depends on amendments (have to be in the vegetative characteristics). NZ: Prolong testing or description would be incomplete.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	

Solution (e): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Selected</u> Species	**EFFECT ON STERILE ROOTSTOCK VARIETIES, LATE OR NO FLOWERING**
– All species	NL: No problems. NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (f): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NL: No problems. NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (g): <u>One Single Rootstock</u> Test Guidelines Document for Whole Genus	
– All species	NL: Depending on the ability of the species to flower early (at a young age) or not and on the variability of the vegetative characteristics that are used. NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	

– Walnut	
– Other species (specify)	

Question 7: What would be the effect on the testing of interspecific hybrids? Please give separate answers to the above questions for each of the following species:

– All species	AU: TGs may not suit the characteristics of the interspecific hybrid - too restrictive. JP: Regarding interspecific hybrid varieties made from one particular combination of two species, it seems that the very first application will be easy to examine, especially about the distinctness from other existing varieties. However, it would be difficult to examine the distinctness of further applications of interspecific hybrids of the same combination. NL: Depending only on the way the subject of each TGs is described. NZ: Problem if one species is not covered. ZA: Use description that is most applicable.
– Apple	DE: No problem for interspecific hybrids if TGs cover whole genus as proposed by DE.
– Grape	DE: No effects, but classification of varieties (vine, grape rootstock) should be clear.
– Pear	DE: No problem for interspecific hybrids if TGs cover whole genus as proposed by DE.
– Plum	DE: Solution (e) is the best basis for the testing of species crossings, but is only useful if collection inside species crossing is large.
– Walnut	
– Other species (specify)	DE: Cherry: solution (e) is the best basis for the testing of species crossings, but is only useful if collection inside species crossing is large. ZA: Citrus: interspecific hybrids to be tested in the fruit TGs until it becomes necessary to adopt solution (c). ZA: Guava, avocado: not applicable.
Solution (b): <u>Parallel</u> Fruit and Rootstock Test Guidelines	
– All species	NZ: Problem if one species is not covered.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (c): <u>Amended</u> Test Guidelines and	

Rootstock Test Guidelines for Selected Species	
– All species	NZ: Could cover non-fruit species.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (d): <u>Parallel</u> Fruit and Rootstock Test Guidelines and one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NZ: Could cover non fruit species.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (e): <u>Parallel</u> Fruit and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Selected</u> Species	**EFFECT ON INTERSPECIFIC HYBRIDS**
– All species	NZ: None if selected species are selected correctly.
– Apple	
– Grape	
– Pear	
– Plum	DE: Solution (e) is the best basis for the testing of species crossings, but is only useful if collection inside species crossing is large.
– Walnut	
– Other species (specify)	DE: Cherry: solution (e) is the best basis for the testing of species crossings, but is only useful if collection inside species crossing is large.
Solution (f): <u>Parallel</u> Fruit	

and Rootstock Test Guidelines, one Rootstock Test Guidelines Document for <u>Rest</u> of Genus	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	
Solution (g): <u>One Single Rootstock</u> Test Guidelines Document for Whole Genus	
– All species	NZ: None.
– Apple	
– Grape	
– Pear	
– Plum	
– Walnut	
– Other species (specify)	

Question 8: Would you limit the number of characteristics for seed propagated rootstock varieties in which you would require uniformity compared to those used for vegetatively propagated rootstock varieties? Would you limit it for cross-pollinated varieties only or also for self-pollinated varieties? In case of limitation please explain according to which criteria or how.

Species	Pollination	
All species		JP: Since in JP there is no experience in testing any seed propagating rootstock varieties, it is difficult to make comments on this question. At any rate, there is no provision in the national regulation on DUS test allowing to omit any characteristics on the list. NL: The Table of Characteristics could be the same, but in clonal varieties all plants have the same genotype, in cross-fertilized none has the same genotype as another.
Apple	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	NZ: No limitation, no separate list. DE: No limitation but so far no varieties. NL: Not applicable. NZ: Not applicable. NL: Not applicable.
Grape	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	DE: No limitation but so far no varieties.
Pear	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	DE: No limitation but so far no varieties. NL: Not applicable. NL: No limitation of characteristics.
Plum	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	NZ: No limitation, no separate list. DE: No limitation. NL: Not applicable. NL: No limitation of characteristics.
Walnut	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	

Other species (specify)	(a) vegetatively propagated (b) seed propagated • self-pollinated • cross-pollinated	NZ: Actinidia: no limitation, no separate list. ZA: Citrus, guava, avocado: not applicable. DE: Cherry: no limitation. NL: Cherry: not applicable. NZ: Actinidia: not applicable. NL: No limitation of characteristics.

Question 9: Is it in your view possible to ignore characteristics of the flower and fruit in order to reduce the testing period? How would you handle off-types in fruit or flower characteristics detected after the grant of right if you replied affirmatively to the first sentence?

- **Flower and fruit characteristics <u>can</u> <u>be</u> <u>ignored.</u>**

<u>AU, DE</u> (for apple and pear if off-types above the tolerance limits occur in flower or fruit characteristics after the grant of protection. This has no effect on the grant as the TGs in the version valid at the date of granting protection (which at present do not contain such characteristics for apple and pear) are the basis for protection), <u>GB, ZA</u> (if no differences are found, testing should be prolonged to fruiting stage).

- Flower and fruit characteristics <u>cannot</u> <u>be</u> <u>ignored.</u>

<u>DE</u> (for grape, plum, cherry), <u>FR</u> (if they exist) <u>JP, NL, NZ</u>

- **Off-types in flower and fruit characteristics if detected after grant of right and bypassing the normally tolerated number will have <u>no</u> <u>effect</u> <u>on</u> <u>the</u> <u>right</u>**

<u>AU, FR, NL, NZ</u> (possibly is rarely seen), <u>ZA</u>

- **Off-types in flower and fruit characteristics if detected after grant of right and bypassing the normally tolerated number will lead to a <u>withdrawal</u> <u>of</u> <u>the</u> <u>right</u>.**

<u>AU</u> (for characteristics which were claimed as being distinct from all other similar varieties), <u>FR</u> (provided the rootstock varieties as tested remain DUS), <u>JP, NZ, ZA</u> (for back mutations rights are canceled (very seldom found)).

- **Other remarks**

<u>NZ</u>: If distinctness can be achieved without using fruit or flowers then it could be acceptable to exclude them. In this case distinctness would have to be very clear. The withdrawal of rights should be considered one of last resort and should not be used as means of reducing testing time or the requirements of testing. In commerce, uniformity or non-uniformity in fruit and flowers would rarely be seen, as rootstock varieties very rarely are allowed to flower

or fruit. The long-term practical monitoring of commercial rootstock varieties for uniformity testing would be almost solely based on vegetative characteristics.

ZA: The fruits and flowers are not important with the rootstocks, but they can be used as characteristics to distinguish between varieties. In commerce no fruits or flowers are seen anyway and growers do not know what they look like at all. They are only of value if vegetatively it is not possible to distinguish.

Question 10: What other effects would you foresee which are not mentioned above?

[no answers received]

Question 11: Which of the above solutions would you prefer, taking into account your answers given above?

(a) One single solution for all rootstocks of all genera or species.

AU: Solution (c) (amended Test Guidelines and one selected rootstock Test Guidelines document)

GB: Solution (e) (parallel Test Guidelines and one selected rootstock Test Guidelines document)

(b) Different solutions depending on the genera or species

Apple:	DE: Solution (g) JP: Solution (b) NL: Solution (a) NZ: Solution (a) or (b)
Grape:	DE: For all vegetatively propagated varieties: fruit TGs JP: Solution (a)
Pear:	DE: Solution (g) JP: Solution (a) NL: Solution (a) NZ: Solution (c)
Plum:	DE: Solution (b), in future possibly (e) JP: Solution (a) NL: Might be solution (e), otherwise solution (a) NZ: Solution (c)
Walnut:	JP: Solution (a) NL: Solution (a)

Other species:

Cherry	DE: Solution (b), in future possibly (e) JP: Solution (a) NL: Might be solution (e), otherwise solution (a) NZ: Solution (c) ZA: Solution (a), if insufficient solution (c)
Peach:	JP: Solution (a) NL: Might be solution (e), otherwise solution (a) NZ: Solution (c)
Actinidia:	NZ: Solution (a)
Stone fruits:	NZ: Solution (c) or (d)

Question 12: What other questions in connection with the testing of rootstock varieties would you like to be discussed in the next session of the TWF?

NL: Could isoenzym electrophoresis be of help as additional characteristics or for the assessment of uniformity?

NZ: 1. Pear rootstock varieties should be considered a special case. A general decision will not necessarily apply to these because many pear rootstock varieties do not belong to *Pyrus,* but to an entirely different genus *Cydonia*.

2. We suggest that one format for all rootstock guidelines is not appropriate. The selection should be done for each species. This would take into account each species specific characteristic and requirements.

3. Growing requirements should specify trees or stoolbeds. Plant material for testing fruit varieties may not be suitable for rootstock variety testing.

ZA: What about tissue cultured material in relation to normally propagated material? Maybe the differences have to be taken into consideration on how long to wait, one or two generations.

Some breeders want testing done at nursery stage but that will be very difficult–to get similar varieties all into nursery stage.

[End of document]