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TG/GINSENG(proj.2)
ORIGINAL: English
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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

Ginseng

(*Panax spp.)* *

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

to be considered by the
Technical Working Party for Agricultural Crops at its thirty-second session,
to be held in Tsukuba, Japan, from September 8 to 12, 2003

Alternative Names:*

Latin	*English*	*French*	*German*	*Spanish*
Panax spp	Ginseng	Ginseng	Ginseng	Ginseng

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" (hereinafter referred to as the "General Introduction") and its associated "TGP" documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Panax spp.*

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seed.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

200g or 0.4 liters of seed

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Duration of Tests

The minimum duration of tests should normally be a single growing cycle.

3.2 Testing Place

3.2.1 The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be observed at that place, the variety may be tested at an additional place.

3.2.2 Soil should be fumigated if the testing takes place in the field which has been used for Ginseng cultivation.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 In order to ensure appropriate growth the testing field should be shaded in such a way that only 15% of sunlight reaches the plants. It is recommended to use a field which has lain fallow for ten years after the cultivation of ginseng.

3.3.2 Stage of development for the assessment

All observations should be made on 4-year-old plants.

3.3.3 Type of observation – visual or measurement

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants]

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 100 plants, which should be divided between three replicates.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations should be made on 20 plants or parts taken from each of 20 plants.

3.6 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity, a population standard of 5% and an acceptance probability of at least 90 % should be applied. In the case of a sample size of 100 plants, 8 off-types are allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness is aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Stem: anthocyanin coloration (characteristic 4)
(b) Leaf: shape of central leaflet (characteristic 11)
(c) Berry: maturity (time of 50% plants having berries with the color of maturation) (characteristic 22)
(d) Berry: color(at full maturity) (characteristic 23)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

(*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3
(QN) Quantitative characteristic – see Section 6.3
(PQ) Pseudo-qualitative characteristic – see Section 6.3

(a) – (b) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	**VG**	**Shoot: time of 50% emergence**					
QN		early				Sunpoong	3
		medium				Yunpoong	5
		late				Chunpoong	7
2.	**MS**	**Plant: length of main stem**					
(+)							
QN		short				Yunpoong	3
		medium				Gumpoong, Mimaki	5
		long				Chunpoong	7
3.	**MS**	**Stem: number of plants with more than two stems**					
QN		very few (less than 10%)				Chunpoong	1
		very few to few (11 20%)					2
		few (21 30%)					3
		few to medium (31 40%)					4
		medium (41 ~ 50%)					5
		medium to many (51-60%)					6
		many (more than 61%)				Yunpoon	7
4.	**VG**	**Stem: anthocyanin coloration**					
(*)							
QL		absent				Gumpoong	1
		present				Gopoong	9

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	**VG**	**Stem: distribution of anthocyanin coloration (Varieties with anthocyanin coloration only)**					
QL		predominately at part				Chunpoong	1
		predominately at upper part					2
		both at base and upper part					3
		along the whole stem				Gopoong	4
6.	**MS**	**Petioles: length**					
(+)							
QN	**(a)**	short					3
		medium				Mimaki	5
		long					7
7.		**Petioles: angle with main axis**					
(+)							
QN	**(a)**	erect				Chunpoong	3
		semi erect				Yunpoong	5
		horizontal					7
8.	**MS**	**Leaf: number of leaves/stem**					
QN	**(a)**	few (3 4)					3
		medium (5)				Chunpoong, Mimaki	5
		many (6 7)					7

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. **(+)**	**VG**	**Leaf: length of central leaflet blade**					
QN	**(a)**	short				Yunpoong	3
		medium				Chunpoong, Mimaki	5
		long				Gumpoong	7
10. **(+)**	**VG**	**Leaf: width of the largest part of central leaflet blade**					
QN	**(a)**	narrow				Yunpoong	3
		medium				Chunpoong, Mimaki	5
		broad				Gumpoong	7
11. **(*)** **(+)**	**VG**	**Leaf: shape of central leaflet**					
QL	**(a)**	broad elliptic					1
		elliptic				Chunpoong	2
		spatulate					3
12. **(+)**	**VG**	**Leaf: shape in cross section of leaflet**					
QN	**(a)**	concave				Chunpoong	3
		plane				Sunpoong	5
		convex				Yunpoong	7
13. **(*)**	**VG**	**Leaf: serration of margin in central leaflet**					
QN	**(a)**	weak					3
		medium					5
		strong					7

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14. **(+)**	**VG**	**Leaf: occurrence of stipule**					
QN	**(a)**	absent or few (20%)				Chunpoong	3
		medium (30 40%)					5
		many (60%)				Yunpoong	7
15.	**VG**	**Leaf: wrinkleless of surface (blistering)**					
QN	**(a)**	weak					3
		medium					5
		strong					7
16.	**VG**	**Leaf: intensity of green color**					
QN	**(a)**	light				Chunpoong	3
		medium				Yunpoong, Mimaki	5
		dark				Gumpoong	7
17.	**VG**	**Leaf: leaf color in maturity**					
QL	**(a)**	yellow				Gumpoong	1
		orange				Chunpoong	2
		red				Yunpoong	3
18. **(*)**		**Time of flowering:50% of plant with flower**					
QN		early					3
		medium				Mimaki	5
		late					7

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
19 (*) (+)		**Flower stalk: length**					
QN		short				Yunpoong	3
		medium				Gumpoong, Mimaki, Kaishusan	5
		long				Sunpoong	7
20. (*) (+)		**Inflorescence: type**					
QL		simple				Yunpoong	1
		semi complex					2
		complex					3
21. (*) (+)	**VS**	**Flower spike: angle at base**					
QN		semi-erect				Gopoong	3
		horizontal				Chunpoong	5
		semi-pendulous				Yunpoong	7
22. (*)	**VS**	**Berry: maturity (time of 50% plants having berries with the color of maturation)**					
QN		early					3
		medium					5
		late				Chunpoong	7
23. (*)	**VG**	**Berry: color (at full maturity)**					
QL		yellow				Gumpoong	1
		orange				Chunpoong,	2
		red				Yunpoong, Mimaki, Kaishusan	3

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
24.	**VG**	**Berry: shape(at full maturity)**					
QL		compressed					1
		globose					2
		twin globose				Mimaki	3
25. **(+)**	**MS**	**Main root: thickness (2-3 cm below rhizome)**					
QN	**(b)**	thin					3
		medium				Chunpoong, Mimaki,	5
		thick				Yunpoong, Kaishusan	7
26. **(*)** **(+)**	**MS**	**Main root: length**					
QN	**(b)**	short					3
		medium				Gopoong, Mimaki, Kaishusan	5
		long				Chunpoong	7
27.	**VG**	**Main root: skin color**					
QL	**(b)**	white				Chunpoong, Mimaki, Kaishusan	1
		creamy				Yunpoong	2
		yellow					3
28.	**VG**	**Root:shape of rhizome(presence of stolon rhizome or not)**					
QL		absent					1
		present				Mimaki, Kaishusan	9

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	**MS**	**Root: ethaol extract of root(50% ethanol-soluble extract of dry root)**					
QN		low					3
		medium				Mimaki, Kaishusan	5
		high					7
30.	**MS**	**Root: identification of saponin (recognition of ginsenoside Rg1 in root)**					
QN		negative					1
		positive				Mimaki, Kaishusan	2
31.	**MS**	**Root: dry matter percentage**					
QN		low					3
		medium				Mimaki	5
		high					7

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

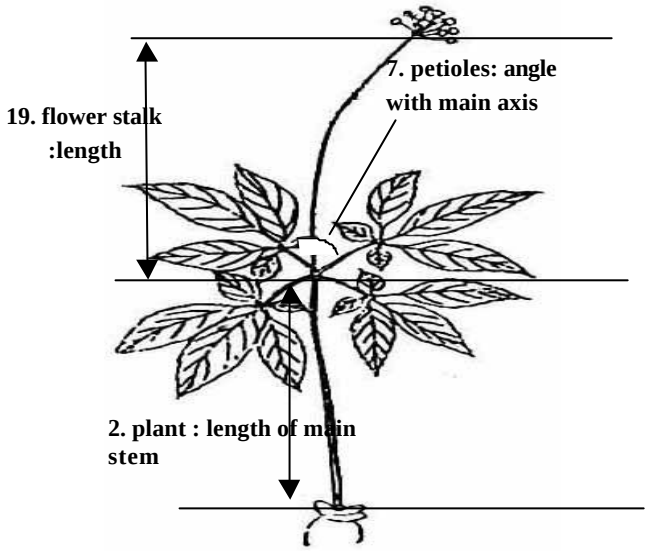
Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a) Leaf: All observations on the leaf should be made on fully developed petiol.

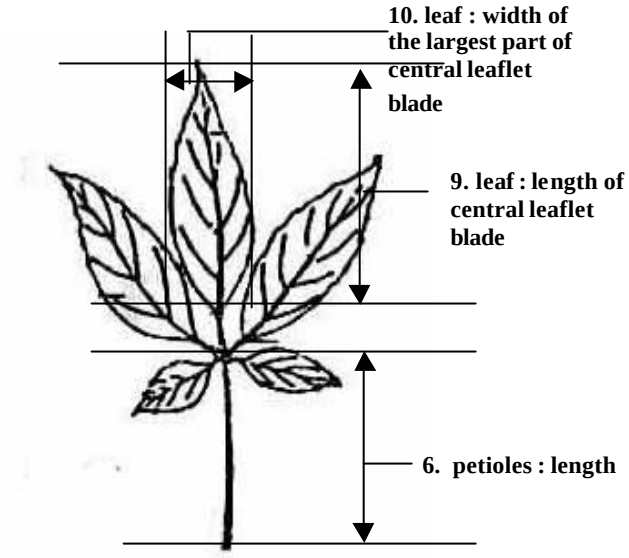
(b) Main Root: All observations on the main root should be made after harvest.

8.2 Explanations for individual characteristics

Ad. 2: Plant: length of main Stem
Ad. 7: Petioles: angle with main axis
Ad. 19: Flower stalk: length



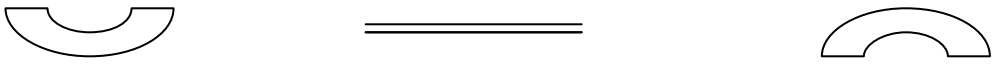
Ad. 6: Petioles: length
Ads. 9 and 10: Leaf: length of central leaflet blade (9) and width of the largest part of central leaflet blade (10)



Ad. 11: Leaflet: shape of central leaf

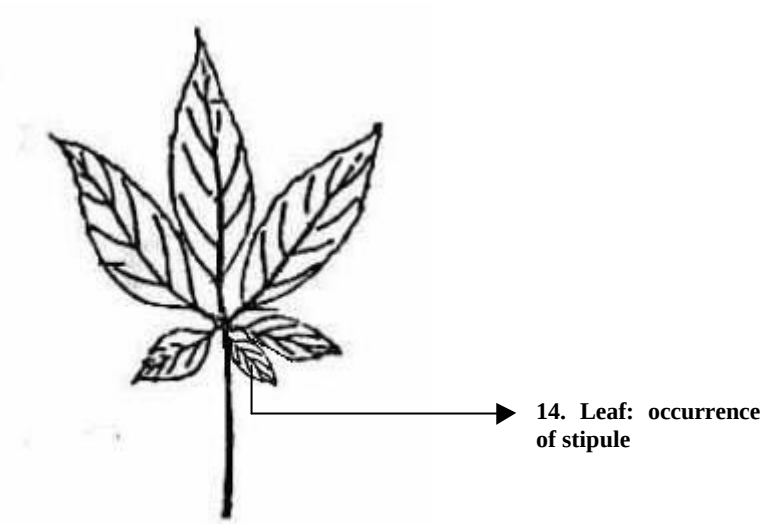
1	2	3
broad-elliptic	elliptic	spatulate

Ad. 12: Leaf: shape in cross section of leaflet



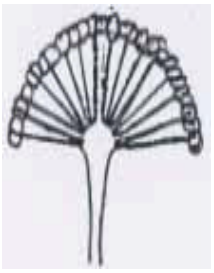
3	5	7
concave	plane	convex

Ad. 14: Leaf: occurrence of stipule

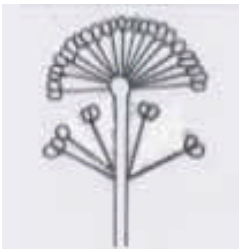


3. absent or few(>20%): plants with more than 20% stipule
5. medium (30~40%): plants with 30~40% stipule
7. many(<60%): plants with less than 60% stipule

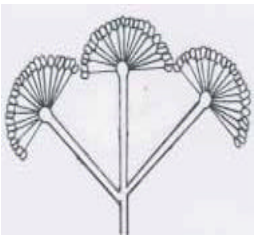
Ad. 20: Inflorescence: type



1
simple

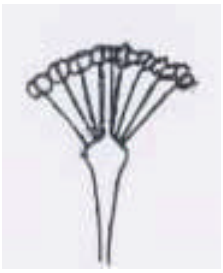


2
semi complex

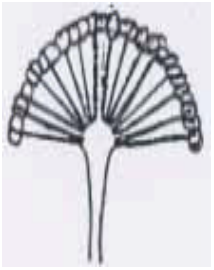


3
complex

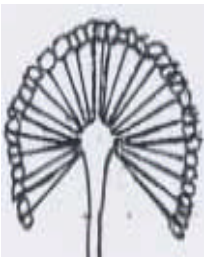
Ad. 21: Flower spike: angle at base



3
semi-erect

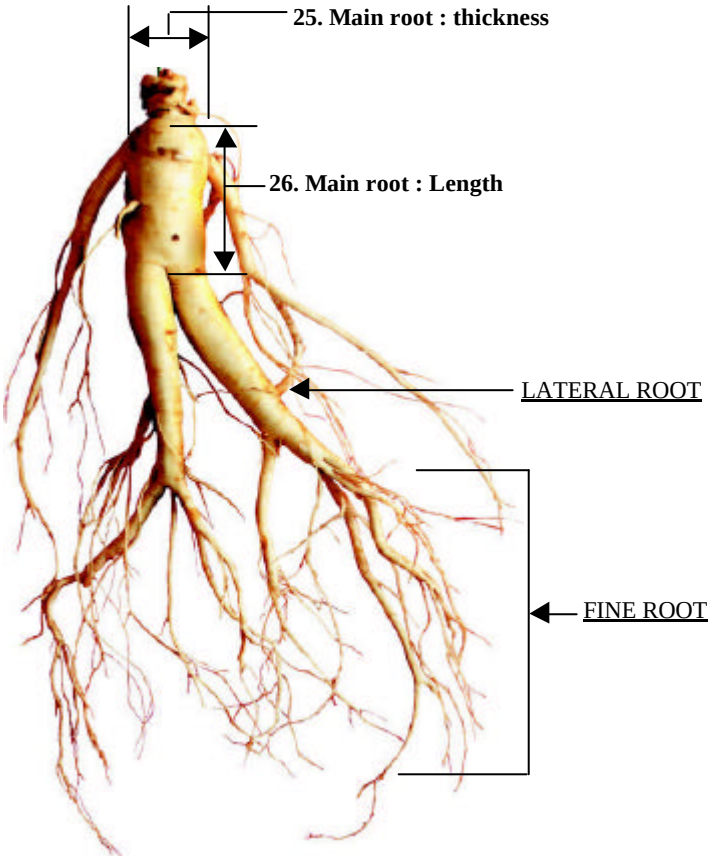


5
horizontal



7
semi-pendulous

Ads. 25, 26: Main root thickness (25) and length (26)



Life cycle of Ginseng

Growing Year	General Description
1	One leaf with three leaflets
2	Two leaves, each leaf has 5 leaflets
3	Three leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 10 poor florets formed in each
4	Four leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)
5	Five leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)
6	Six leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)

9. Literature

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W. Scott Persons: "American Ginseng Green Gold," Bright Mountain Books, Inc.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 *Latin Name*	*Panax spp.*
1.2 Common Name	Ginseng

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(b) partially known cross [ ]
(please state known parent variety(ies))
(c) totally unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery [ ]
(please state where, when and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (4)	**Stem: anthocyanin coloration**		
	absent	Gumpoong	1
	present	Gopoong	9
5.2 (11)	**Leaf: shape of central leaflet**		
	broad elliptic		1 [ ]
	elliptic	Chunpoong	2 [ ]
	spatulate		3 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.3 (13)	**Leaf: serration of margin in central leaflet**		
	weak		3 [ ]
	medium		5 [ ]
	strong		7 [ ]
5.4 (18)	**Time of Flowering : 50% of plant with flower**		
	early		3 [ ]
	medium	Mimaki	5 [ ]
	late		7 [ ]
5.5 (19)	**Flower stalk: length**		
	short	Yunpoong	3 [ ]
	medium	Gumpoong, Mimaki, Kaishusan	5 [ ]
	long	Sunpoong	7 [ ]
5.6 (20)	**Inflorescence type**		
	simple	Chunpoong	1 [ ]
	Semi complex		2 [ ]
	complex		3 [ ]
5.7 (22)	Berry: maturity (time of 50% plants having berries with the color of maturation)		
	early		3 [ ]
	medium		5 [ ]
	late	Chunpoong	7 [ ]
5.8 (23)	Berry: color (at full maturity)		
	yellow	Gumpoong	1 [ ]
	orange	Chunpoong	2 [ ]
	red	Yunpoong, Mimaki, Kaishusan	3 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.9 (26)	**Main root: length**		
	short		3 [ ]
	medium	Gopoong, Mimaki, Kaishusan	5 [ ]
	long	Chunpoong	7 [ ]

6. Similar varieties and differences from these varieties

Please use the table, and space provided for comments, below to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Berry*	*yellow*	*red)*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

7.2.1 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

7.2.2 If yes, please give details:

7.3 Other information

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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9. Information on plant material to be examined.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant or pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details of where you have indicated “yes”.

……

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]