E

TG/224/2(proj.3)
ORIGINAL: English
DATE: 2019-08-02

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

GINSENG

UPOV Code(s): PANAX_GIN

Panax ginseng C.A. Mey.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from the Republic of Korea
to be considered by the
Technical Working Party for Agricultural Crops
at its forty-eighth session, to be held in Montevideo, Uruguay,
from 2019-09-16 to 2019-09-20

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Panax ginseng C.A. Mey.	Ginseng	Ginseng	Ginseng	Ginseng

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with 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.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Panax ginseng* C.A. Mey..

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

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.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

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 Number of Growing Cycles

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

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

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 The optimum stage of development for the assessment of each characteristic is indicated by a number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.

3.3.4 Examination has to be conducted with 4 or 5 year old plants.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 60 plants, which should be divided between at least 3 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 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 differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

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.

4.1.4 Number of Plants or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts of plants taken from each of 20 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation 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

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

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 These Test Guidelines have been developed for the examination of self-pollinated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 For the assessment of uniformity of self-pollinated, a population standard of 3% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 60 plants, 4 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 further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial 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 are 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 5)
(b) Leaflet: shape (characteristic 18)
(c) Berry: attitude of cluster (characteristic 24)
(d) Berry: color (characteristic 26)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 **2**	**3** **4**	**5** **6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(c) See Explanations on the Table of Characteristics in Chapter 8.1

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.		**QN MG**	**(+)**				
		Time of sprouting					
		early				Chungsun, Geumsun, Sunpoong	3
		medium				Yunpoong	5
		late				Chunpoong, K-1, Kowon, Sunun	7
2.	**(*)**	**QN MS/VG**	**(+)**	**(a)**			
		Plant: stem length					
		short				Yunpoong	3
		medium				Gumpoong	5
		long				Chunpoong, Geumsun	7
3.		**QN MS/VG**	**(+)**	**(a)**			
		Plant: stem diameter					
		small				Chunpoong	3
		medium				Chungsun, K-1	5
		large				Gopoong, Sunpoong	7
4.		**QN VG**					
		Plant: tendency to form more than one stem					
		low				Chunpoong	1
		medium				Kowon	3
		high				Yunpoong	5
5.	**(*)**	**QL VG**		**(a)**			
		Stem: anthocyanin coloration					
		absent				Chungsun, Gumpoong	1
		present				Gopoong	9
6.	**(*)**	**QN VG**		**(a)**			
		Stem: intensity of anthocyanin coloration					
		weak				Cheonryang, Chunpoong, Kowon, Yunpoong	3
		medium				Sunpoong, Sunun	5
		strong				Gopoong, K-1	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.	**(*)**	**PQ VG**	**(a)**				
		Stem: distribution of anthocyanin coloration					
		on lower part only				Chunpoong	1
		on lower and upper part				Yunpoong	2
		along the whole stem				Gopoong, Sunhyang	3
8.		**QN MS**	**(+)** **(b)**				
		Petiole: length					
		short				Cheonryang	3
		medium				Gumpoong	5
		long				Kowon	7
9.	**(*)**	**QL VG**	**(b)**				
		Petiole: anthocyanin coloration					
		absent				Chungsun, Gumpoong	1
		present				Gopoong	9
10.	**(*)**	**QN VG**	**(b)**				
		Petiole: intensity of anthocyanin coloration					
		weak				Chunpoong	3
		medium				Cheonryang	5
		strong				Gopoong, K-1	7
11.		**QN VG**	**(+)** **(b)**				
		Petiole: attitude					
		erect				Chunpoong	1
		semi erect				Yunpoong	3
		spreading				Gopoong	5
12.		**QN MS/VG**	**(+)** **(b)**				
		Petiolule: length					
		short				Chunpoong, Sunhyang, Yunpoong	3
		medium				Cheonryang, Gumpoong	5
		long				Sunpoong	7

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**(*)**	**QL**	**VG**	**(+)**	**(b)**				
		Leaf: presence of additional leaflets							
		absent						Gopoong	1
		present						Yunpoong	9
14.		**QN**	**VG**		**(b)**				
		Leaf: blistering of surface							
		weak						K-1	1
		medium						Gumpoong	2
		strong						Sunun	3
15.		**QN**	**VG**		**(b)**				
		Leaf: intensity of green color							
		light						Chunpoong	1
		medium						Yunpoong	3
		dark						Sunwon	5
16.		**QN**	**MS/VG**	**(+)**	**(c)**				
		Leaflet: length							
		short						Yunpoong	3
		medium						Chunpoong, Kowon	5
		long						Gumpoong	7
17.		**QN**	**MS/VG**	**(+)**	**(c)**				
		Leaflet: width							
		narrow						Chunpoong	3
		medium						Gopoong	5
		broad						Gumpoong, Sunhyang	7
18.	**(*)**	**PQ**	**VG**	**(+)**	**(c)**				
		Leaflet: shape							
		narrow elliptic						Chunpoong	1
		medium elliptic						Gopoong, Sunhyang	2
		oblong						Gumpoong	3
		spatulate							4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.		**QN** **VG**	**(+)** **(c)**				
		Leaflet: shape in cross section					
		concave				Chunpoong	1
		flat				Kowon	2
		convex				Cheonryang, K-1	3
20.	**(*)**	**QN** **VG**	**(+)** **(c)**				
		Leaflet: serration of margin					
		weak				Chunpoong	1
		medium				Yunpoong	2
		strong				Sunun	3
21.	**(*)**	**QN** **MG**	**(+)**				
		Beginning of flowering					
		early				Sunpoong	3
		medium				K-1, Yunpoong	5
		late				Chunpoong	7
22.	**(*)**	**QN** **VG**	**(+)**				
		Peduncle: length					
		short				Yunpoong	3
		medium				Gumpoong	5
		long				Sunpoong	7
23.	**(*)**	**QL** **VG**	**(+)**				
		Inflorescence: type					
		simple				Yunpoong	1
		intermediate				Gumpoong	2
		compound				Sunun	3
24.	**(*)**	**QN** **VG**	**(+)**				
		Berry: attitude of cluster					
		semi erect				Gopoong, K-1	1
		horizontal				Chunpoong, Gumpoong	3
		reflexed				Yunpoong	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	**(*)**	**QN**	**MG**	**(+)**					
		Berry: time of maturity							
		early						Gumpoong	3
		medium						Yunpoong	5
		late						Chunpoong	7
26.	**(*)**	**PQ**	**VG**						
		Berry: color							
		yellow						Gumpoong	1
		yellowish orange						Cheonmyeong	2
		reddish pink						Chunpoong	3
		red						K-1, Kowon, Sunpoong, Yunpoong	4
27.	**(*)**	**PQ**	**VG**						
		Leaf: color at senescence							
		yellow						Gumpoong	1
		yellowish orange						Chunpoong	2
		red						Gopoong, K-1, Yunpoong	3
28.	**(*)**	**QN**	**MS/VG**	**(+)**					
		Main root: diameter							
		small						Chunpoong	3
		medium						Cheonryang, Gumpoong	5
		large						Cheonmyeong, Yunpoong	7
29.	**(*)**	**QN**	**MS/VG**						
		Main root: length							
		short						Yunpoong	3
		medium						Gopoong	5
		long						Chunpoong, Gumpoong	7
30.		**PQ**	**VG**						
		Main root: skin color							
		whitish						Chunpoong	1
		yellowish						Yunpoong	2

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	**QN** **VG**					
	Root: number of rootlets					
	few				Chunpoong	3
	medium				Sunpoong	5
	many				Gopoong, K-1	7

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

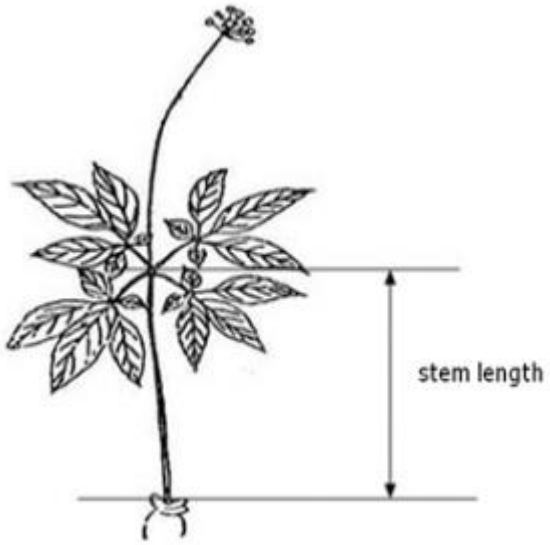
(a) Stem: observations should be made on the longest and/or thickest stem among stems if more than one stem exist.
(b) Leaf: observations should be made on the biggest fully developed leaves.
(c) Leaflet: observations should be made on the central leaflet of palmately compound leaf.

8.2 Explanations for individual characteristics

Ad. 1: Time of sprouting

Time of sprouting is when 50% of the plants have sprouted.

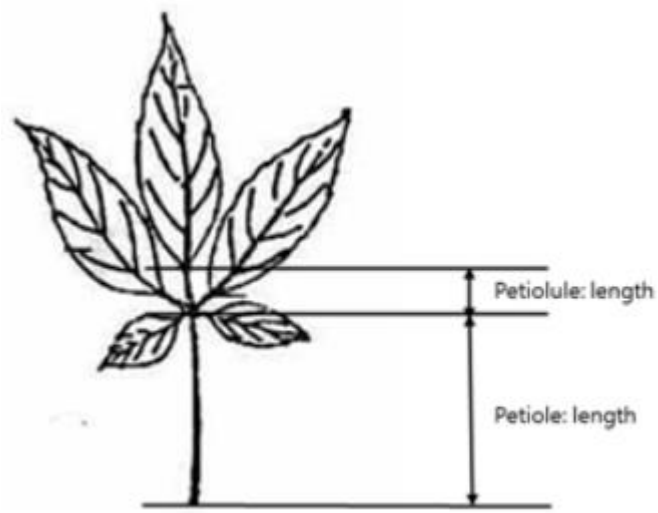
Ad. 2: Plant: stem length



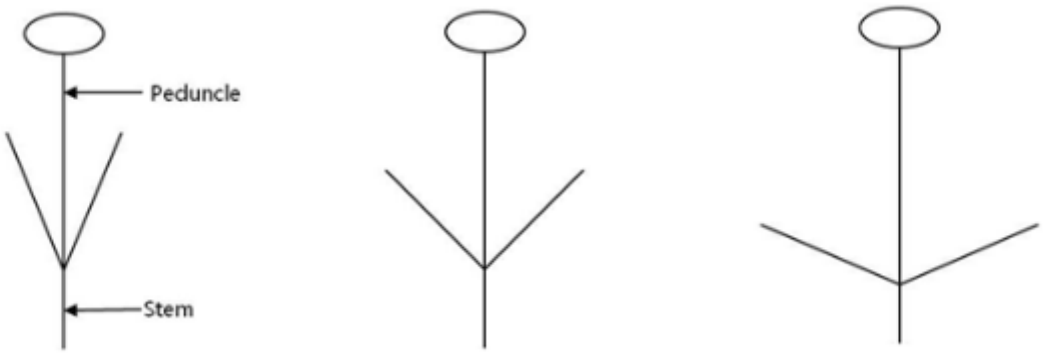
Ad. 3: Plant: stem diameter

Measure the broadest part of stem, usually 2-3 cm upper from the soil surface.

Ad. 8: Petiole: length



Ad. 11: Petiole: attitude



1
erect

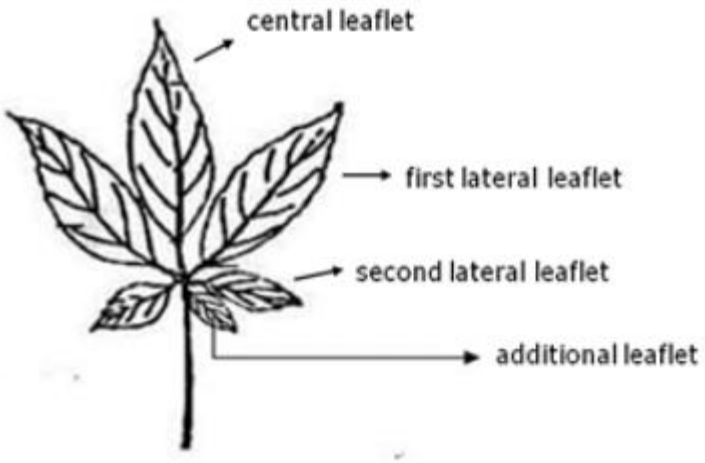
3
semi erect

5
spreading

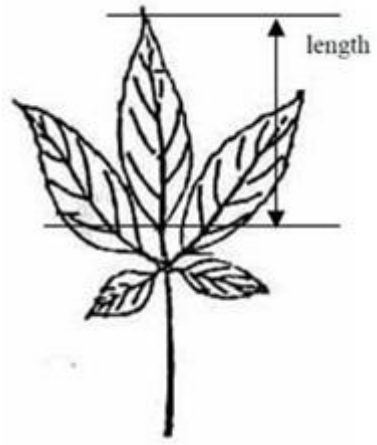
Ad. 12: Petiolule: length

See Ad. 8.

Ad. 13: Leaf: presence of additional leaflets



Ad. 16: Leaflet: length



Ad. 17: Leaflet: width

Ad. 18: Leaflet: shape

1
narrow elliptic

2
elliptic

3
oblong

4
spatulate

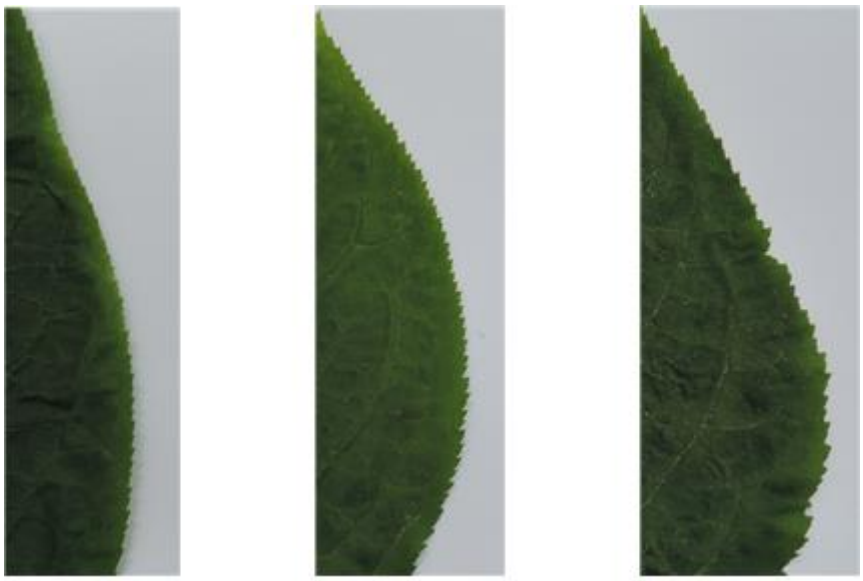
Ad. 19: Leaflet: shape in cross section

1
concave

2
flat

3
convex

Ad. 20: Leaflet: serration of margin



1
weak

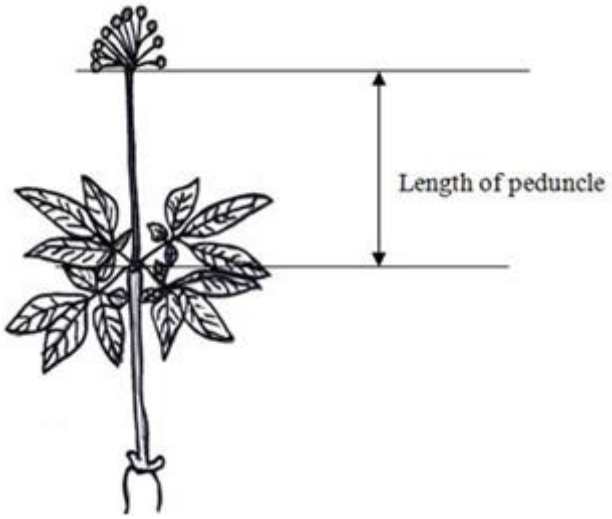
2
medium

3
strong

Ad. 21: Beginning of flowering

Beginning of flowering is when about 10% of the plants have flowered at least 1 floret.

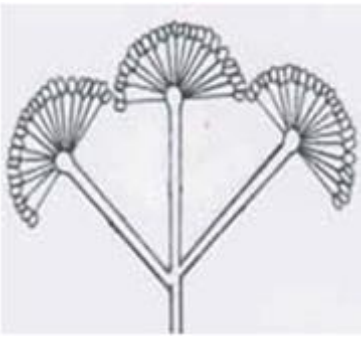
Ad. 22: Peduncle: length



Ad. 23: Inflorescence: type

1
simple

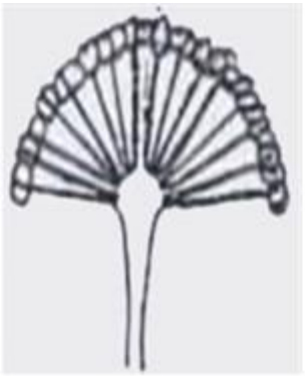
2
intermediate



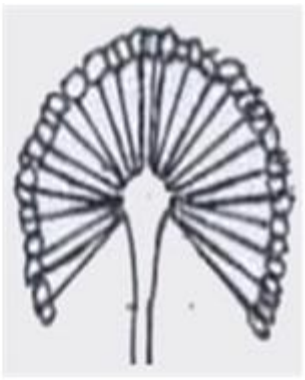
3
compound

Ad. 24: Berry: attitude of cluster

1
semi erect



3
horizontal

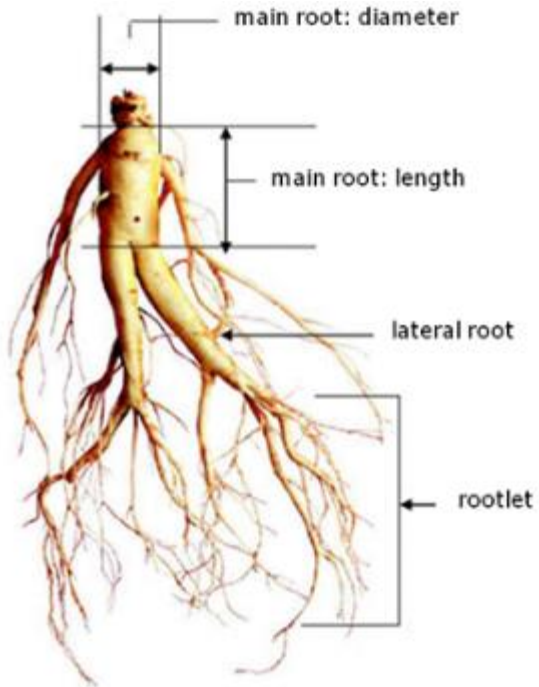


5
reflexed

Ad. 25: Berry: time of maturity

Observations should be made when 50% of plants have berries fully ripe.

Ad. 28: Main root: diameter



8.3 Typical morphological characteristics by yearly growth

Growing Year	*Typical Morphological Characteristics*
1	One palmately compound leaf with three leaflets on a stem
2	Two palmately compound leaves, each leaf has 5 leaflets on a stem
3	Three palmately compound leaves, each leaf has 5 leaflets on a stem Flower and rhizome differentiation (around 10 poor florets formed in each umbel)
4	Four palmately compound leaves, each leaf has 5 leaflets on a stem Flower and rhizome differentiation (more than 40 florets formed in each umbel)
5	Five palmately compound leaves, each leaf has 5 leaflets on a stem Flower and rhizome differentiation (more than 40 florets formed in each umbel)
6	Six palmately compound leaves, each leaf has 5 leaflets on a stem Flower and rhizome differentiation (more than 40 florets formed in each umbel)

9. Literature

British Columbia, Ministry of Agriculture, Fisheries and Food, 1998: Ginseng production guide for commercial growers. Victoria B. C., British Columbia, CA.

Chun, S. K., Mook, S. K. etc., 1991: Effect of light intensity and quality on the growth and quality of Korean ginseng(*Panax ginseng* C.A. Meyer).- 1. Effects of light intensity on the growth and yield of ginseng plants. Journal of Ginseng Research. KR. 15(1), pp. 21-30.

Kim Y. C., Kim J. U. etc., 2017: The classification of the morphological characteristics of aerial vegetative tissues in a large germplasm collection of Korean ginseng(*Panax* sp.). Journal of the Faculty of Agriculture, Kyushu University. JP. 62(1), pp. 69-74.

Korea Seed and Variety Service, 2014: Test guideline of Ginseng for DUS Test(36/3). Korea Seed and Variety Service, Ministry of Agriculture, Food and Rural Affairs(MAFRA), KR.

Kwon W. S., Lee M. G. etc., 2000: Breeding process and characteristics of Yunpoong, a new variety of *Panax ginseng* C. A. Meyer. Journal of Ginseng Research. KR. 24(1), pp. 1-7.

Kwon W. S., Lee M. G. etc., 2001: Characteristics of flowering and fruiting in new varieties and lines of Panax ginseng C. A. Meyer. Journal of Ginseng Research. KR. 25(1), pp. 41-44.

Lee, J. H., Lee, J. C. etc., 1982: Studies on the optimum light intensity for growth of *Panax ginseng*. - 1. Effect of light intensity on growth of shoots and roots of ginseng plants. Korean Journal of Ginseng Science. KR. 6(1), pp. 38-45.

Persons, W. Scott, 1994: American Ginseng Green Gold. Bright Mountain Books, Inc., Asheville, North Carolina, US.

Seeds and Seedlings Division, 2012: Standard Description of Characteristics for the Identification of New Varieties of Ginseng and its Related Species, Ministry of Agriculture, Forestry and Fisheries (MAFF), JP.

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	Botanical name	*Panax ginseng* C.A. Mey.
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)
(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(please state known parent varieties)
(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(Please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Other (please provide details) [ ]

4.2.2 Other [ ]
(Please provide details)

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

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 (2)	**Plant: stem length**		
	short	Yunpoong	3 [ ]
	medium	Gumpoong	5 [ ]
	long	Chunpoong, Geumsun	7 [ ]
5.2 (5)	**Stem: anthocyanin coloration**		
	absent	Chungsun, Gumpoong	1 [ ]
	present	Gopoong	9 [ ]
5.3 (6)	**Stem: intensity of anthocyanin coloration**		
	weak	Cheonryang, Chunpoong, Kowon, Yunpoong	3 [ ]
	medium	Sunpoong, Sunun	5 [ ]
	strong	Gopoong, K-1	7 [ ]
5.4 (7)	**Stem: distribution of anthocyanin coloration**		
	on lower part only	Chunpoong	1 [ ]
	on lwer and upper part	Yunpoong	2 [ ]
	along the whole stem	Gopoong, Sunhyang	3 [ ]
5.5 (9)	**Petiole: anthocyanin coloration**		
	absent	Chungsun, Gumpoong	1 [ ]
	present	Gopoong	9 [ ]
5.6 (10)	**Petiole : intensity of anthocyanin coloration**		
	weak	Chunpoong	3 [ ]
	medium	Cheonryang	5 [ ]
	strong	Gopoong, K-1	7 [ ]
5.7 (13)	**Leaf: presence of additional leaflets**		
	absent	Gopoong	1 [ ]
	present	Yunpoong	9 [ ]

	Characteristics	Example Varieties	Note
5.8 (18)	**Leaflet: shape**		
	narrow elliptic	Chunpoong	1 [ ]
	medium elliptic	Gopoong, Sunhyang	2 [ ]
	oblong	Gumpoong	3 [ ]
	spatulate		4 [ ]
5.9 (20)	**Leaflet: serration of margin**		
	weak	Chunpoong	1 [ ]
	medium	Yunpoong	2 [ ]
	strong	Sunun	3 [ ]
5.10 (21)	**Beginning of flowering**		
	early	Sunpoong	3 [ ]
	medium	K-1, Yunpoong	5 [ ]
	late	Chunpoong	7 [ ]
5.11 (22)	**Peduncle: length**		
	short	Yunpoong	3 [ ]
	medium	Gumpoong	5 [ ]
	long	Sunpoong	7 [ ]
5.12 (23)	**Inflorescence: type**		
	simple	Yunpoong	1 [ ]
	intermediate	Gumpoong	2 [ ]
	compound	Sunun	3 [ ]
5.13 (24)	**Berry: attitude of cluster**		
	semi erect	Gopoong, K-1	1 [ ]
	horizontal	Chunpoong, Gumpoong	3 [ ]
	reflexed	Yunpoong	5 [ ]
5.14 (25)	**Berry: time of maturity**		
	early	Gumpoong	3 [ ]
	medium	Yunpoong	5 [ ]
	late	Chunpoong	7 [ ]

	Characteristics	Example Varieties	Note
5.15 (26)	**Berry: color**		
	yellow	Gumpoong	1 [ ]
	yellowish orange	Cheonmyeong	2 [ ]
	reddish pink	Chunpoong	3 [ ]
	red	K-1, Kowon, Sunpoong, Yunpoong	4 [ ]
5.16 (27)	**Leaf: color at senescence**		
	yellow	Gumpoong	1 [ ]
	yellowish orange	Chunpoong	2 [ ]
	red	Gopoong, K-1, Yunpoong	3 [ ]
5.17 (28)	**Main root: diameter**		
	small	Chunpoong	3 [ ]
	medium	Cheonryang, Gumpoong	5 [ ]
	large	Cheonmyeong, Yunpoong	7 [ ]
5.18 (29)	**Main root: length**		
	short	Yunpoong	3 [ ]
	medium	Gopoong	5 [ ]
	long	Chunpoong, Gumpoong	7 [ ]

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

6. Similar varieties and differences from these varieties

Please use the following table and box for comments 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 color*	*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 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

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.

9. Information on plant material to be examined or submitted for examination

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, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for 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]