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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

LITCHI

UPOV Code: LITCHI_CHI

Litchi chinensis Sonn.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from China

to be considered by the

Technical Working Party for Fruit Crops at its forty-third session,
to be held in Beijing, from July 30 to August 3, 2012

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Litchi chinensis Sonn.	Litchi, Lychee	Litchi	Litschi	Lichi

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.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Litchi chinensis* Sonn..

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 air-layerings or grafts. If the material is supplied in the form of grafts, the rootstocks of the grafts should also be supplied at the same time.

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

5 plants

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

3.1.1 The minimum duration of tests should normally be two independent growing cycles.

3.1.2 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst, flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

3.1.3 In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

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

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.

3.4 Test Design

Each test should be designed to result in a total of at least 5 plants.

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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts taken from each of 2 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 second column of 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 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no 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 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) Fruit: size (characteristic 35)
(b) Fruit: color of skin (characteristic 40)
(c) Fruit: shape of skin segments (characteristic 41)
(d) Time of beginning of flowering (characteristic 53)

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

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

(a)-{e} See Explanations on the Table of Characteristics in Chapter 8.1

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

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(*)** **(+)**	**VG**	**Plant: growth habit**					
QN	**(a)**	upright				Baitangying	1
		spreading				Guiwei	3
		drooping				Yuanzhi	5
2. **(+)**	**VG**	**Plant: shape**					
PQ	**(a)**	circular				Nuomici	1
		elliptic				Baitangying	2
		triangular					3
		irregular					4
3. **(*)** **(+)**	**VG**	**Plant: vigor**					
QN	**(a)**	weak				Baitangying	1
		medium				Huaizhi	2
		strong				Zhuangyuanhong	3
4.	**VG**	**One-year-old shoot: thickness**					
QN	**(b)**	thin				Shangshuhuai	3
		medium				Guiwei	5
		thick				Sanyuehong	7
5.	**VG**	**One-year-old shoot: attitude**					
QN	**(b)**	upwards				Baitangying	1
		outwards				Nuomici	2
		downwards				Yuanzhi	3
6. **(+)**		**One-year-old shoot: length of internode**					
QN	**(b)**	short				Dianbaibaila	3
		medium				Sanyuehong	5
		long				Yuanzhi	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.	**VG**	**One-year-old shoot: size of lenticels**					
QN	**(b)**	small				Xiapuli	1
		medium				Yuanzhi	2
		large				Luhebao	3
8.	**VG**	**One-year-old shoot: density of lenticels**					
QN	**(b)**	sparse				Baitangying	3
		medium				Guiwei	5
		dense				Nuomici	7
9.	**VG**	**Young shoot: color**					
new							
PQ	**(b)**	yellow					1
		yellow green				Nuomici	2
		green				Guiwei	3
		brown				Sanyuehong	4
		red					5
10.	**VG**	**Leaf: arrangement of leaflets**					
(+)							
PQ	**(c)**	always opposite				Nuomici	1
		mainly opposite				Chenzi	2
		mainly alternate				Heiye	3
11.	**MS/**	**Leaf: length**					
(*)	**VG**						
(+)							
QN	**(c)**	very short				Ziniangxi	1
		short				Huaizhi	3
		medium				Xuehuaizi,	5
		long				Yuanzhi	7
		very long				Tianjiazi	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12. (*)	**VG**	**Leaf: color of petiole on upper side**					
PQ	**(c)**	green				Tianjiazi	1
		green brown				Feizixiao	2
		brown				Yuanzhi	3
		brown red				Guiwei	4
13. (*) (+)	**VG**	**Leaflet: shape**					
PQ	**(c)**	lanceolate				Yuanzhi	1
		ovate				Fenghua	2
		oblong				Lanzhu	3
		elliptic				Baitangying	4
		obovate				Qingpitian	5
14. (*)	**VG**	**Leaflet: shape in cross section**					
QN	**(c)**	strongly concave				Baitangying	1
		moderately concave				Nuomici	2
		flat				Sanyuehong	3
		convex				Shangshuhuai	4
15.	**VG**	**Leaflet: surface of upper side**					
QN	**(c)**	smooth				Guiwei	1
		moderately rough					2
		very rough				Xuehuaizi	3
16. (+)	**MS/ VG**	**Leaflet: length of petiolule**					
QN	**(c)**	short				Yuanzhi	1
		medium				Huaizhi	2
		long				Dianbaibaila	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.	**VG/ MS**	**Leaflet blade: length**					
QN	**(c)**	very short				Ziniangxi	1
		short				Nuomici	3
		medium				Zhongshanzhuangyuanhong	5
		long				Heiye	7
		very long				Yuanzhi	9
18.	**VG/ MS**	**Leaflet blade: width**					
QN	**(c)**	very narrow				Ziniangxi	1
		narrow				Shuijingqiu	3
		medium				Nuomici	5
		wide				Baitangying	7
		very wide				Tianjiazi	9
19. (*)	**MS**	**Leaflet blade: ratio length/width**					
QN	**(c)**	very elongated				Yuanzhi (Shuidong)	1
		elongated				Chenzi	3
		medium				Guiwei	5
		compressed				Nuomici	7
		very compressed				Huaizhi	9
20. (*) (+)	**VG**	**Leaflet blade: symmetry of apex**					
QN	**(c)**	symmetric or weakly asymmetric				Baitangying	1
		moderately asymmetric					2
		clearly asymmetric				Nuomici	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. **(+)** **New**	**VG**	**Leaflet blade: length of tip**					
QN	**(c)**	very short					1
		short				Huaizhi, Baitangying	2
		medium				Guiwei, Nuomici	3
		long				Yuanzhi (Shuidong)	4
22. **(+)**	**VG**	**Leaflet blade: shape of apex**					
PQ	**(c)**	caudate					1
		acuminate				Ziniangxi	2
		acute				Yuanzhi	3
		obtuse				Huaizhi	4
23. **(+)**	**VG**	**Leaflet blade: symmetry of base**					
QN	**(c)**	symmetric or weakly asymmetric				Nuomici	1
		moderately asymmetric					2
		clearly asymmetric				Guiwei	3
24. **(*)** **(+)**	**VG**	**Leaflet blade: undulation of margin**					
QN	**(c)**	absent or weak				Lanzhu	1
		medium				Nuomici	2
		strong				Baitangying	3
25. **(*)**	**VG**	**Leaflet blade: intensity of green color**					
QN	**(c)**	light				Qingpitian	1
		medium				Nuomici	2
		dark				Heiye	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.	**VG**	**Leaflet blade: glossiness of upper side**					
QN	**(c)**	weak				Heiye	1
		medium				Huaizhi	2
		strong				Dianbaibaila	3
27.	**VG**	**Leaflet blade: conspicuousness of lateral veins**					
QN	**(c)**	weak				Guiwei	1
		medium				Nuomici	2
		strong				Sanyuehong	3
28. **(*)** **(+)**	**VG/ MS**	**Inflorescence: length**					
QN	**(d)**	short				Ziniangxi	3
		medium				Huaizhi	5
		long				Chenzi	7
29. **(*)** **(+)**	**VG/ MS**	**Inflorescence: width**					
QN	**(d)**	narrow				Xuehuaizi	1
		medium				Guiwei	2
		broad				Chenzi	3
30. **(*)**	**MS**	**Inflorescence: ratio length/width**					
QN	**(d)**	elongated				Dazao, Feizixiao	3
		medium				Guiwei, Nuomici	5
		compressed				Huaizhi	7
31. **(+)**	**VG**	**Inflorescence: density of branching**					
QN	**(d)**	sparse				Chenzi	3
		medium				Nuomici	5
		dense				Shuijingqiu	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32.	**VG**	**Inflorescence: density of florets**					
QN	**(d)**	sparse				Zhumuru	3
		medium				Guiwei	5
		dense				Sanyuehong	7
33.	**VG**	**Inflorescence: intensity of green color on main axis**					
QN	**(d)**	light				Nuomici	1
		medium				Huaizhi	2
		dark				Sanyuehong	3
34. **(*)** **(+)**	**VG**	**Flower: depth of stigma splitting**					
QN	**(d)**	shallow				Chenzi	1
		medium				Huaizhi	2
		deep				Xuehuaizi	3
35. **(*)**	**VG**	**Fruit: size**					
QN	**(e)**	very small				Xinxingxiangli	1
		small				Chenzi	3
		medium				Guiwei	5
		large				Sanyuehong	7
		very large				Ziniangxi	9
36. **(*)** **(+)**	**VG**	**Fruit: shape**					
PQ	**(e)**	elliptic				Jinzhong	1
		ovate				Dazao	2
		circular				Huaizhi	3
		cordate				Nuomici, Ziniangxi	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37. **(*)** **(+)**	**VG**	**Fruit: shape of shoulder at stalk end**					
PQ	**(e)**	sloping				Dazao	1
		truncate				Huaizhi	2
		symmetric depressed				Shuangjianyuhebao	3
		asymmetric depressed				Nuomici	4
38. **(+)**	**VG**	**Fruit: depth of stalk cavity**					
QN	**(e)**	shallow				Guiwei	1
		medium				Nuomici	2
		deep				Ziniangxi	3
39. **(+)**	**VG**	**Fruit: prominence of suture**					
QN	**(e)**	weak				Yuanzhi	1
		medium				Heiye	2
		strong				Xuehuaizi	3
40. **(*)**	**VG**	**Fruit: color of skin**					
PQ	**(e)**	only green					1
		green and red				Feizixiao	2
		yellow and red				Guangming	3
		pink red				Kwai May Pink	
		only bright red				Nuomici	4
		only dark red				Jizuili	5
		purplish red				Ziniangxi	6
41. **(*)** **(+)**	**VG**	**Fruit: shape of skin segments**					
PQ	**(e)**	flattened				Huaizhi	1
		domed				Nuomici	2
		pyramidal				Guiwei	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. (*)	**VG**	**Fruit: size of skin segments**					
QN	**(e)**	small				Chenzi	1
		medium				Guiwei	2
		large				Baitangying	3
43. (*) (+)	**VG**	**Fruit: tip-shape of protuberances**					
PQ	**(e)**	sharp				Guiwei	1
		blunt				Luhebao	2
		obtuse				Baitangying	3
		smooth or slightly raised				Nuomici	4
44. (+)	**VG**	**Fruit: thickness of skin**					
QN	**(e)**	thin				Nuomici	1
		medium				Baitangying	2
		thick				Ziniangxi	3
45.	**VG**	**Fruit: color of flesh**					
PQ	**(e)**	whitish				Guiwei	1
		yellowish				Xuehuaizi	2
		yellow				Wuheli	3
46. (+)	**MG**	**Fruit: weight of seed compared to fruit**					
QN	**(e)**	low				Wuheli, Nuomici	3
		medium				Heiye, Huaizhi	5
		high				Dazao	7
47.		**Fruit: shape of seed**					
PQ	**VG**	elliptic				Dazao, Chenzi	1
		ovate				Huaizhi, Heiye, Baitangying	2
		conical				Nuomici	3
		irregular				Feizixiao	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
48.		**Fruit: color of seed coat**					
PQ	**VG**	red brown				Dazao	
		brown				Huaizhi	
		dark brown				Nuomici	
49. **(*)** **(+)**	**VG**	**Fruit: intensity of brown color on the inner side of aril**					
QN	**(e)**	absent or weak				Huaizhi	1
		medium				Feizixiao	2
		strong				Yuanzhi	3
50. **(+)**	**MG**	**Fruit: content of total soluble solids**					
QN	**(e)**	low				Ziniangxi	3
		medium				Feizixiao	5
		high				Nuomici	7
51. **(+)**	**VG**	**Fruit: juiciness**					
QN	**(e)**	weak				Baitangying	1
		medium				Heiye	2
		strong				Feizixiao	3
52. **(*)** **(+)**	**VG**	**Fruit: ratio of abortive seeds**					
QN	**(e)**	low				Heiye, Chenzi	3
		medium				Guiwei, Jizuili	5
		high				Nuomici, Xinxingxiangli	7
53. **(*)** **(+)**	**VG**	**Time of beginning of flowering**					
QN	**(d)**	early				Sanyuehong	3
		medium				Heiye	5
		late				Nuomici	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
54. (*)	**VG**	**Time of harvest maturity**					
QN	**(e)**	early				Baitangying	3
		medium				Feizixiao	5
		late				Nuomici	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) All observations on the whole plant should be made during the dormant season before pruning.

b) All observations on the shoot should be made on the mature autumnal shoots from the outside of the upper canopy, when all leaves are turning green and the terminal autumnal shoots just stop developing.

c) All observations on the leaflet blade should be made on the well developed leaflet at the central third of the mature autumnal shoots from the outside of the upper canopy.

d) All observations on the flower should be made on the well developed flowers from the outside of the upper canopy, when 25%-75% of the flowers are in blossom.

e) All observations on the fruit should be made at the time of physiological ripeness from outside of the upper canopy.

8.2 Explanations for individual characteristics

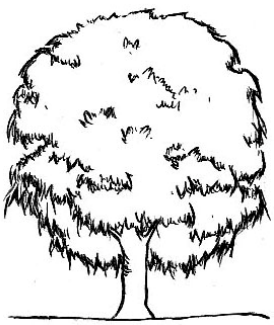
Ad. 1: Plant: growth habit

1
upright

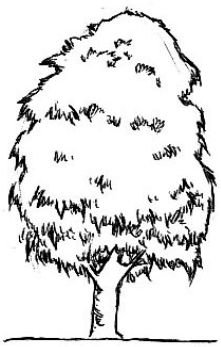
2
spreading

3
drooping

Ad. 2: Plant: shape



1
circular



2
elliptic

3
triangular

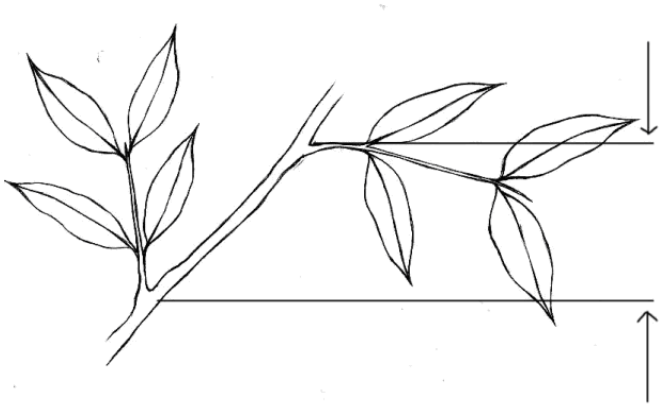
4
irregular

Ad. 3: Plant: vigor

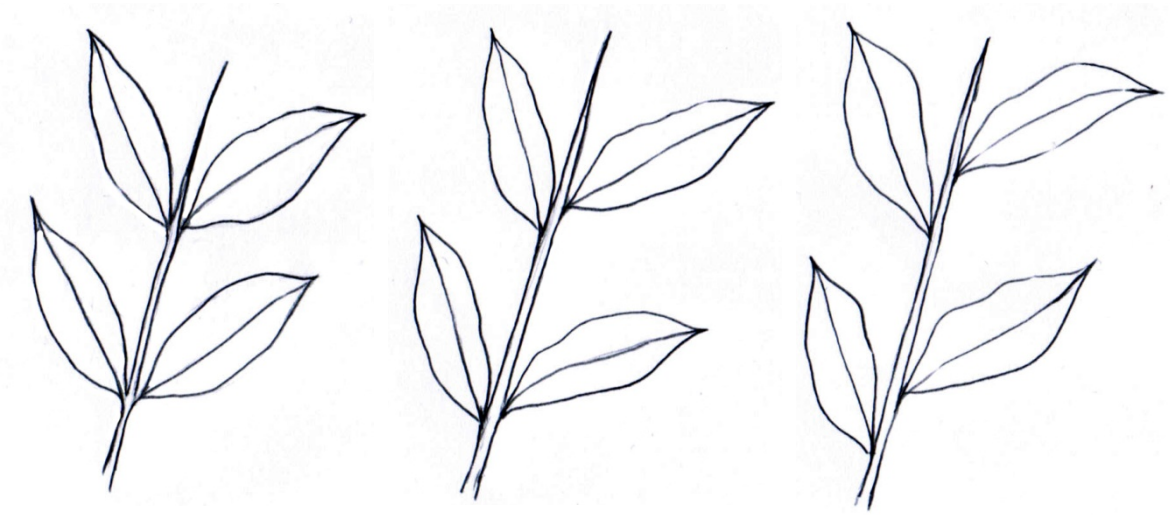
Plant vigor is determined by the evaluation of the overall abundance of vegetative growth.

Ad. 6: One-year-old shoot: length of internode

Observing the stems of growing terminal autumnal shoots, especially the nodal portion. Internodes to be observed on the middle third of the shoot.



Ad. 10: Leaf: arrangement of leaflets

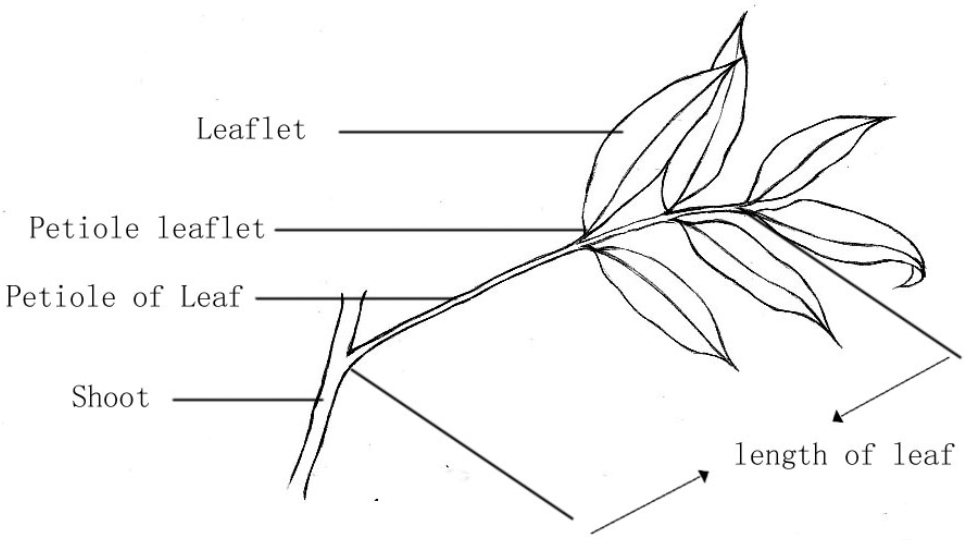


1
always opposite

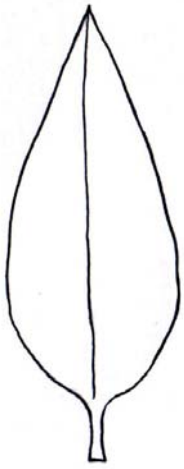
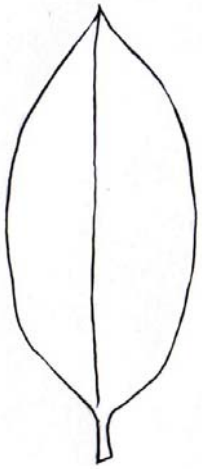
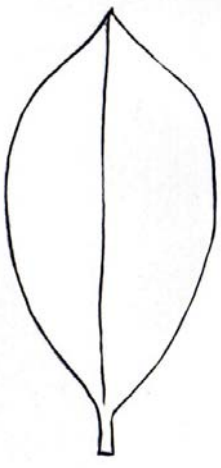
2
mainly opposite

3
mainly alternate

Ad. 11: Leaf: length

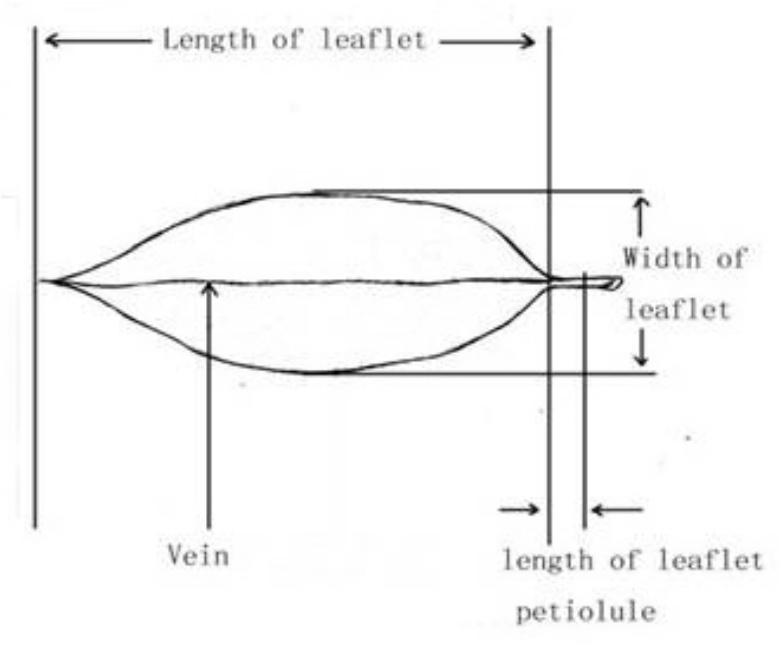


Ad. 13: Leaflet: shape

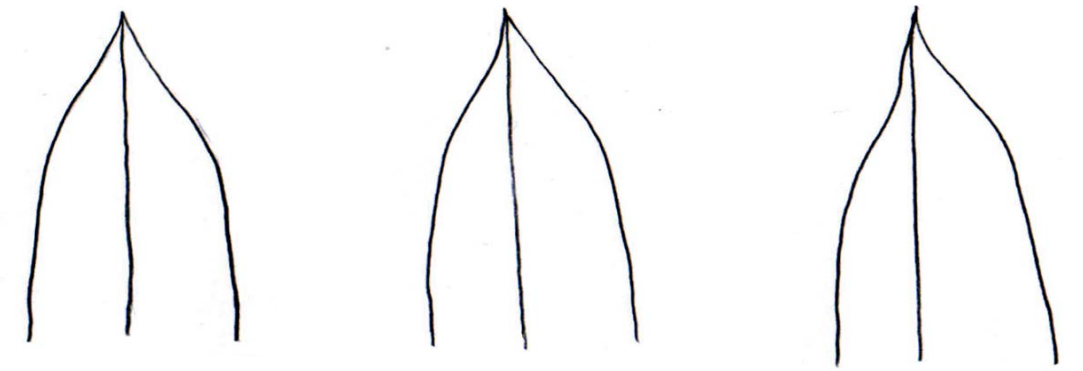
	← Broadest part →		
	Below middle	At middle	Above middle
narrow			
	1 lanceolate		
↓ width →			
		2 oblong	
broad			
	4 ovate	3 elliptic	5 obovate

Ad. 16: Leaflet: length of petiolule

All observations on the leaflet should be made on the largest leaflet of the lowest pair.



Ad. 20: Leaflet blade: symmetry of apex

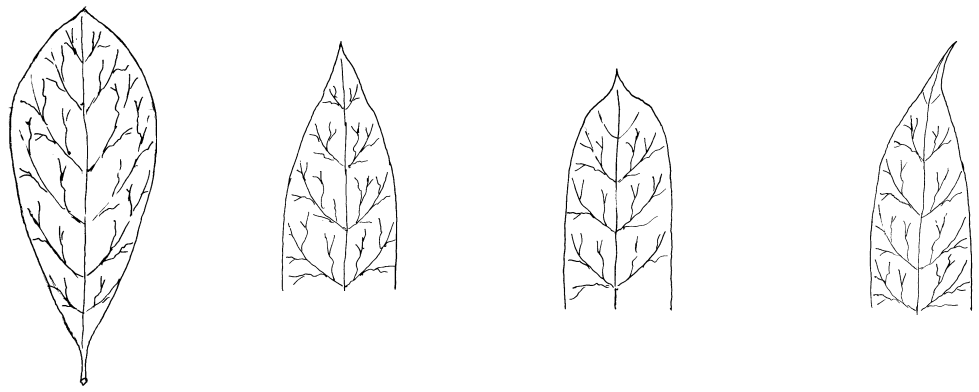


1
symmetric or weakly asymmetric

2
moderately asymmetric

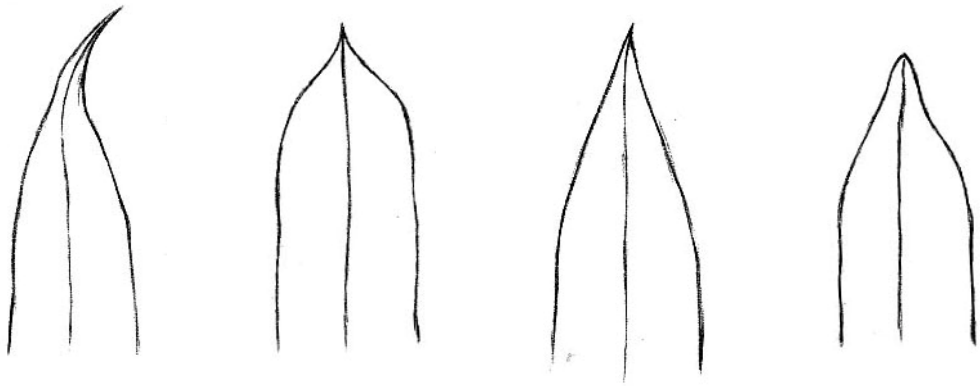
3
clearly asymmetric

Ad. 21: Leaflet blade: length of tip



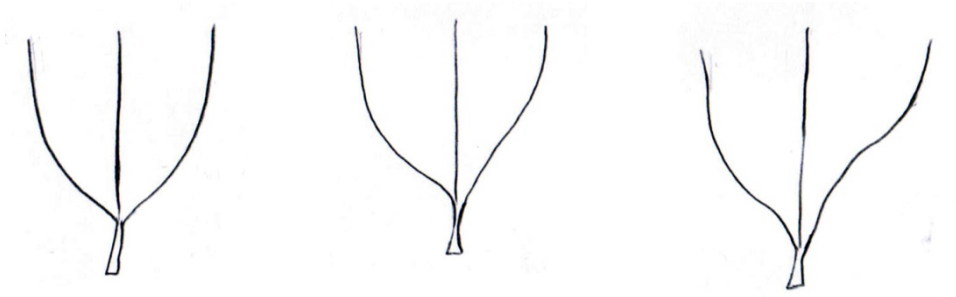
1	2	3	4
very short	short	medium	long

Ad. 22: Leaf blade: shape of apex



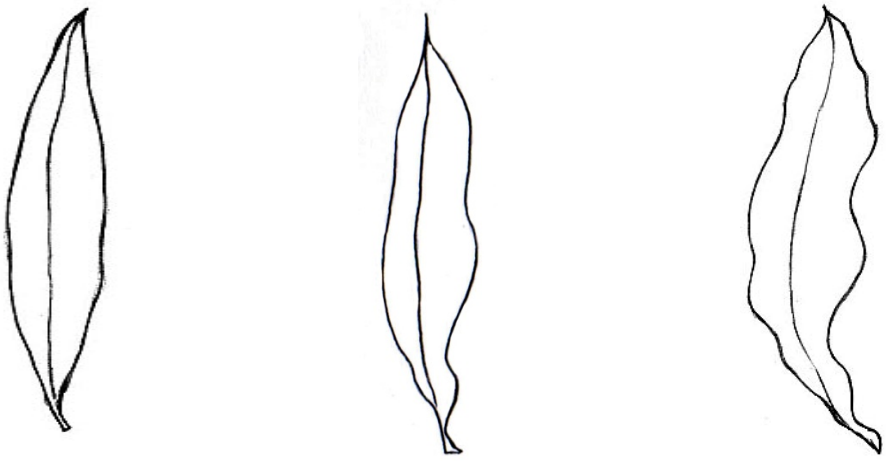
1	2	3	4
caudate	acuminate	acute	obtuse

Ad. 23: Leaf blade: symmetry of base



1	2	3
symmetric or weakly asymmetric	moderately asymmetric	clearly asymmetric

Ad. 24: Leaf blade: undulation of margin

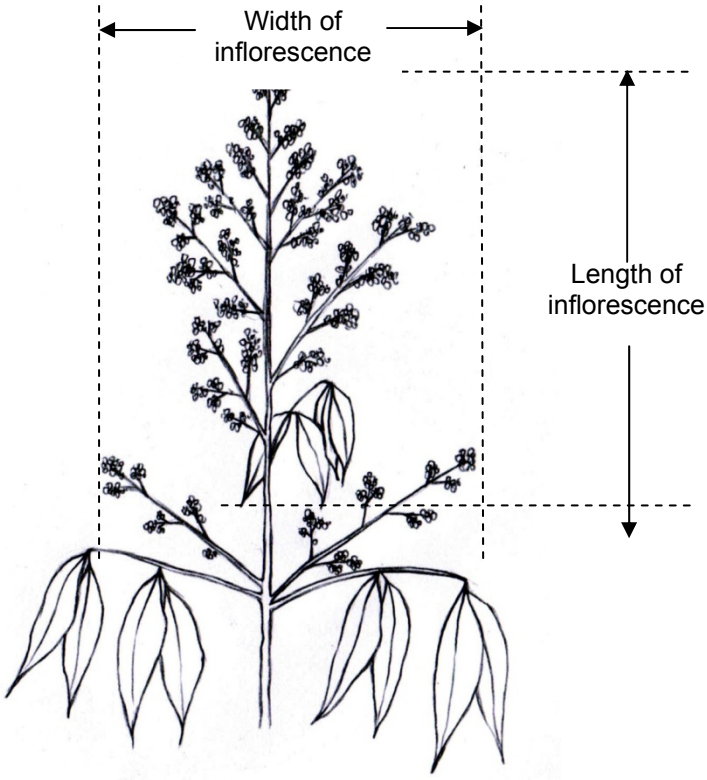


1
absent or weak

2
medium

3
strong

Ad.. 28: Inflorescence: length
Ad. 29: Inflorescence: width



Ad. 31: Inflorescence: density of branching

The density of the secondary branches is observed on the first nodes of the inflorescences.

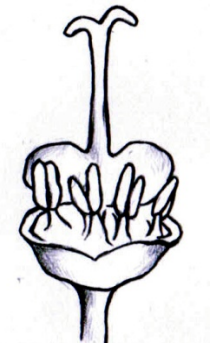
3
sparse

5
medium

7
dense

Ad. 34: Flower: depth of stigma splitting

This applies to female flowers only.

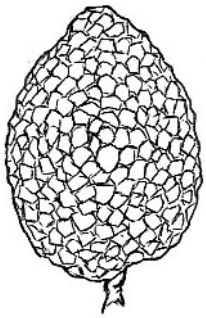
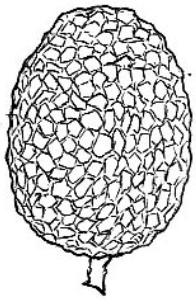
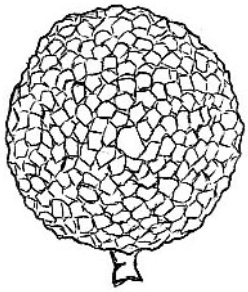
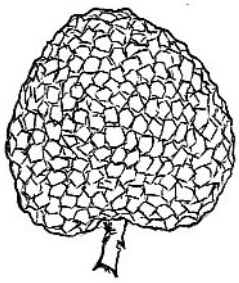


1
shallow

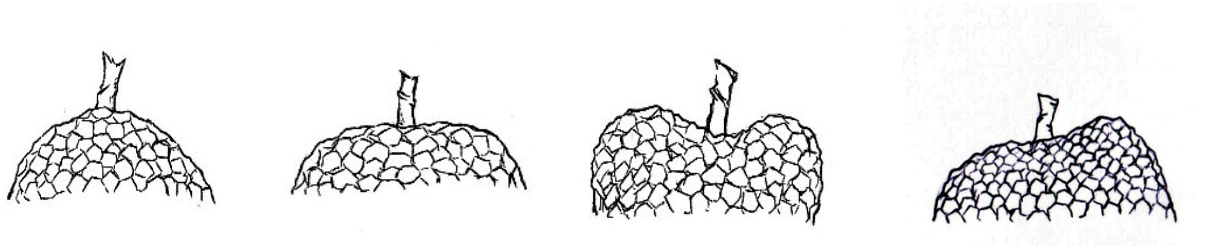
2
medium

3
deep

Ad. 36: Fruit: shape

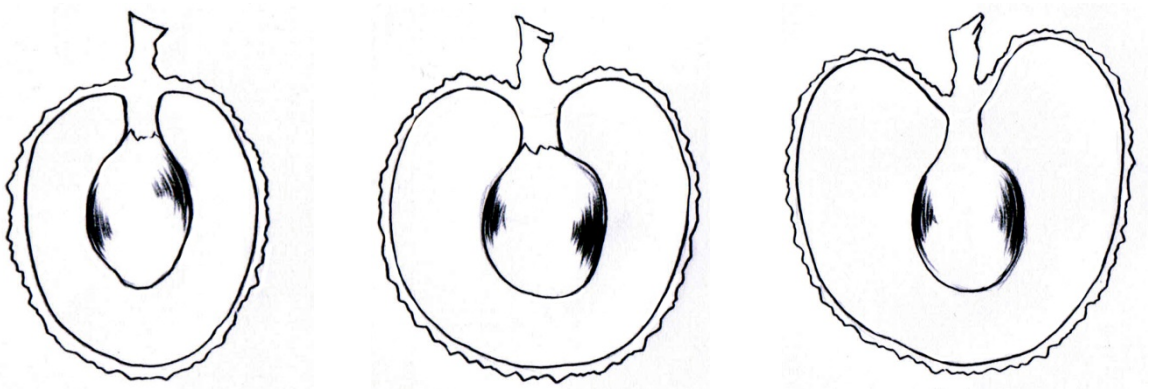
	← Broadest part →		
	Below middle	At middle	Above middle
elongated			
	2 ovate	1 elliptic	
↑ ratio length/width			
↓		3 circular	
compressed			
	4 cordate		

Ad. 37: Fruit: shape of shoulder at stalk end



1	2	3	4
sloping	truncate	symmetric depressed	asymmetric depressed

Ad. 38: Fruit: depth of stalk cavity

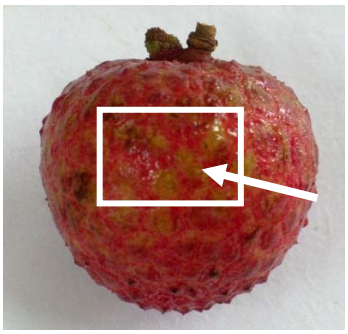


1	2	3
shallow	medium	deep

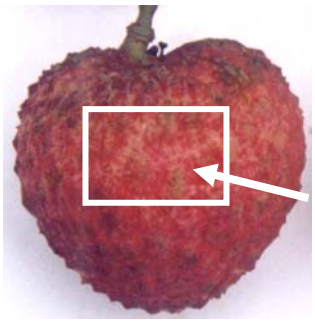
Ad. 39: Fruit: prominence of suture

1	2	3
weak	medium	strong

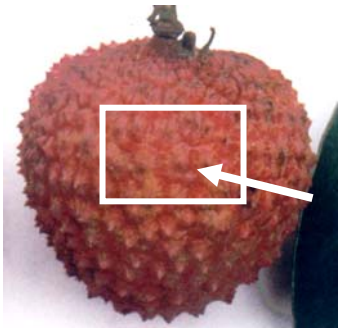
Ad. 41: Fruit: shape of skin segments



1
flattened



2
domed

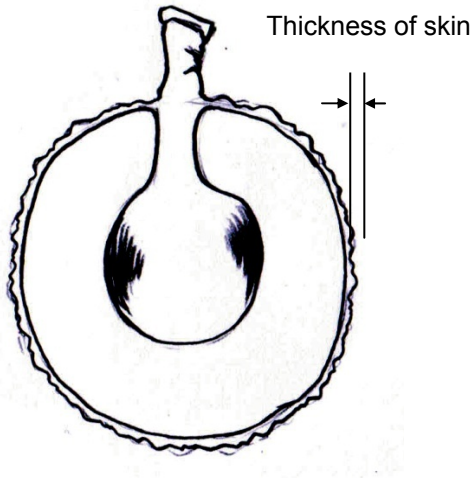


3
pyramidal

Ad. 43: Fruit: tip-shape of protuberances

1	2	3	4
sharp	blunt	obtuse	smooth or slightly raised

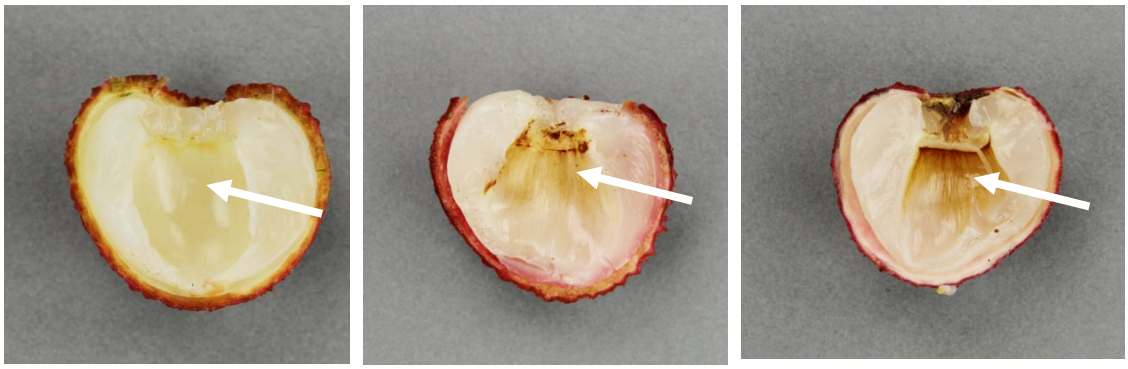
Ad. 44: Fruit: thickness of skin



Ad. 46: Fruit: weight of seed compared to fruit

To be determined on 20 fruits.

Ad. 49: Fruit: intensity of brown color on the inner side of arils



1	2	3
absent or weak	medium	strong

Ad. 50: Fruit: content of total soluble solids

To be measured by refractometer.

Ad. 51: Fruit: juiciness

The fruit is cut into two pieces along the suture with a knife, and then the skin and the core are removed. Afterward, the flesh is wrapped with four layers of absorbent paper for 5 seconds to observe the following:

Weak:	the absorbent paper is not completely wet
Medium:	the absorbent paper is completely wet
Strong:	juice is dripping naturally after the flesh is cut into pieces.

Ad. 52: Fruit: ratio of abortive seeds

Select 20 fruits randomly, then cut the fruit into pieces along the suture to take off the seed and then vertically cut the seed skin open to check the number of the aborted seeds :

Low:	less than 20% seeds aborted
Medium:	20-80% seeds aborted
High:	more than 80% seeds aborted

Ad. 53: Time of beginning of flowering

When 10% panicles have entered into flowering.

9. Literature

Fu, L.J., 1985: An Album of Guangdong Litchi Varieties in Full Colour. Science Popularization Press Guangzhou Branch. Guangzhou, CN, 78 pp.

Menzel, C.M. and Waite, G.K., 2005: Litchi and Longan, Botany, Production and Uses. CABI Publishing. Nambour, Queensland, AU, pp. 59-86

Wu, S.X., 1998: Encylopaedia of China Fruits: Litchi. Forestry Press, Beijing, CN, pp. 94-206

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
{ ASW 13 (Chapter 10: TQ title) – TQ for hybrid varieties}

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Litchi chinensis* Sonn
1.2 Common name	Litchi, Lychee

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))

(……..……..…) 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 Vegetative propagation

(a) cuttings [ ]

(b) air layering [ ]

(c) grafting (budding) [ ]

(d) *in vitro* propagation [ ]

(e) other (state method) [ ]

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 (35)	**Fruit: size**		
	very small	Xinxingxiangli	1[ ]
	very small to small		2[ ]
	small	Chenzi	3[ ]
	small to medium		4[ ]
	medium	Guiwei,	5[ ]
	medium to large		6[ ]
	large	Sanyuehong	7[ ]
	large to very large		8[ ]
	very large	Ziniangxi	9[ ]
5.2 (40)	**Fruit: color of skin**		
	only green		1[ ]
	green and red	Feizixiao	2[ ]
	yellow and red	Guangming, Kwai may pink	3[ ]
	pink red	Nuomici	4[ ]
	only bright red	Jizuili	5[ ]
	purplish red	Ziniangxi	6[ ]
5.3 (41)	**Fruit: shape of skin segments**		
	flattened	Huaizhi	1[ ]
	domed	Nuomici	2[ ]
	pyramidal	Guiwei	3[ ]

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

	Characteristics	Example Varieties	Note
5.4 (53)	**Time of beginning of flowering**		
	very early		1[ ]
	very early to early		2[ ]
	early	Sanyuehong	3[ ]
	early to medium		4[ ]
	medium	Heiye	5[ ]
	medium to late		6[ ]
	late	Nuomici	7[ ]
	late to very late		8[ ]
	very late		9[ ]

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	*e.g. Fruit size*	*e.g. small*	*e.g. medium*

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 image of the variety should accompany the Technical Questionnaire.

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.

[#] 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:

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]