TG/LITCHI(proj.1)
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UPOV

# INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

**DRAFT**

**LITCHI**

UPOV Code: LITCH_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-second session, to be held in Hiroshima, Japan, from November 14 to 18, 2011*

Alternative Names:[*]

| *Botanical name* | *English* | *French* | *German* | *Spanish* |
|---|---|---|---|---|
| *Litchi chinensis* Sonn. | Litchi | 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:

10 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*

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.

*3.4 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. charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, meter, 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-type 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: color of skin (characteristic 37)
(b) Fruit: shape of protuberance (characteristic 38)
(c) Fruit: size (characteristic 41)
(d) Time of beginning of flowering (characteristic47)

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<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **1.**<br>**(*)** | **VG** | **Plant: growth habit** | | | | | |
| **QN** | **(a)** | upright | | | | Baitangying | 1 |
| | | spreading | | | | Guiwei | 3 |
| | | drooping | | | | Yuanzhi | 5 |
| **2.** | **VG** | **Plant: shape** | | | | | |
| **(+)** | | | | | | | |
| **PQ** | **(a)** | spheroid | | | | Nuomici | 1 |
| | | ellipsoid | | | | Baitangying | 2 |
| | | umbrella-shaped | | | | | 3 |
| | | irregular | | | | | 4 |
| **3.**<br>**(*)** | **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 | 3 |
| | | downwards | | | | Yuanzhi | 5 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **6.**<br>**(+)** | | **One-year-old shoot: length of internode** | | | | | |
| **QN** | **(b)** | short | IL : to indicate which internode | | | Dianbaibaila | 3 |
| | | medium | | | | Sanyuehong | 5 |
| | | long | | | | Yuanzhi | 7 |
| **7.** | **VG** | **One-year-old shoot: size of lenticel** | | | | | |
| **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** | **Leaf: arrangement of leaflets** | | | | | |
| **PQ** | **(c)** | in pairs | | | | Nuomic | 1 |
| | | almost in pairs | | | | Chenzi | 2 |
| | | alternate | | | | Heiye | 3 |
| **10.**<br>**(*)**<br>**(+)** | **MS/ VG** | **Leaf: length** | | | | | |
| **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<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **11.<br>(*)** | **VG** | **Leaf: color of petiole on upper side** | | | | | |
| **PQ** | **(c)** | green | | | | Tianjiazi | 1 |
| | | green brown | | | | Feizixiao | 2 |
| | | brown | | | | Yuanzhi | 3 |
| | | red brown | | | | Nuomici | 4 |
| | | brown red | | | | Guiwei | 5 |
| **12.<br>(+)** | **MS/<br>VG** | **Leaflet: length of petiole** | **IL: indicate which leaflet, we propose: all observation on the leaflet should be made on the largest leaflet of the lowest pair.** | | | | |
| **QN** | **(c)** | short | | | | Yuanzhi | 1 |
| | | medium | | | | Huaizhi | 2 |
| | | long | | | | Dianbaibaila | 3 |
| **13.<br>(*)<br>(+)** | **VG** | **Leaflet: shape** | | | | | |
| **PQ** | **(c)** | lanceolate | | | | Yuanzhi | 1 |
| | | oblong | | | | Lanzhu | 2 |
| | | elliptic | | | | Baitangying | 3 |
| | | ovate | | | | Fenghua | 4 |
| | | obovate | | | | Qingpitian | 5 |
| **14.<br>(*)** | **VG** | **Leaflet: shape in cross section** | | | | | |
| **QN** | **(c)** | strongly concave | | | | Baitangying | 1 |
| | | moderately concave | | | | Nuomici | 2 |
| | | flat | | | | Zhongshanshanyuehong | 3 |
| | | convex | | | | Shangshuhuai | 4 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **15.** | **VG** | **Leaflet: surface of upper side** | | | | | |
| **QN** | **(c)** | smooth | | | | Guiwei | 1 |
| | | moderately rough | | | | | 2 |
| | | very rough | | | | Xuehuaizi | 3 |
| **16.** | **MS** | **Leaf blade: length** | | | | | |
| **QN** | **(c)** | very short | | | | Ziniangxi | 1 |
| | | short | | | | Nuomici | 3 |
| | | medium | | | | Zhongshanzhuangyuanhong | 5 |
| | | long | | | | Heiye | 7 |
| | | very long | | | | Yuanzhi | 9 |
| **17.** | **MS** | **Leaf blade: width** | | | | | |
| **QN** | **(c)** | very narrow | | | | Ziniangxi | 1 |
| | | narrow | | | | Shuijingqiu, | 3 |
| | | medium | | | | Nuomici | 5 |
| | | wide | | | | Baitangying | 7 |
| | | very wide | | | | Tianjiazi | 9 |
| **18. (*)** | **MS** | **Leaf blade: ratio length/width** | | | | | |
| **QN** | **(c)** | very small | | | | Huaizhi | 1 |
| | | small | | | | Nuomici | 3 |
| | | medium | | | | Xuehuaizi | 5 |
| | | large | | | | Chenzi | 7 |
| | | very large | | | | Yuanzhi | 9 |
| **19. (*)** | **VG** | **Leaf blade: symmetry of apex** | | | | | |
| **QL** | **(c)** | symmetric | | | | Baitangying | 1 |
| | | asymmetric | | | | Nuomici | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **20.**<br>**(+)** | **VG** | **Leaf blade: shape of apex** | IL : Two char. apex and tip | | | | |
| **PQ** | **(c)** | caudate | | | | | 1 |
| | | acuminate | | | | Ziniangxi | 2 |
| | | acute | | | | Yuanzhi | 3 |
| | | obtuse | | | | Huaizhi | 4 |
| **21.** | **VG** | **Leaf blade: symmetry of base** | | | | | |
| **QL** | **(c)** | symmetric | | | | Nuomici | 1 |
| | | asymmetric | | | | Guiwei | 2 |
| **22.**<br>**(*)**<br>**(+)** | **VG** | **Leaf blade: undulation of margin** | | | | | |
| **QN** | **(c)** | absent or very weak | | | | Lanzhu | 1 |
| | | weak | | | | Guiwei | 3 |
| | | medium | | | | Nuomici | 5 |
| | | strong | | | | Baitangying | 7 |
| **23.**<br>**(*)** | **VG** | **Leaf blade: intensity of green color** | | | | | |
| **QN** | **(c)** | light | | | | Qingpitian | 1 |
| | | medium | | | | Nuomici | 2 |
| | | dark | | | | Heiye | 3 |
| **24.** | **VG** | **Leaf blade : glossiness of upper side** | | | | | |
| **QN** | **(c)** | weak | | | | Heiye | 1 |
| | | medium | | | | Huaizhi | 2 |
| | | strong | | | | Dianbaibaila | 3 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **25.** | **VG** | **Leaf blade: conspicuousness of lateral vein** | | | | | |
| **QN** | **(c)** | weak | | | | Guiwei | 1 |
| | | medium | | | | Nuomici | 2 |
| | | strong | | | | Sanyuehong | 3 |
| **26. (*)** | **MS** | **Inflorescence: length** | | | | | |
| **QN** | **(d)** | short | | | | Ziniangxi | 3 |
| | | medium | | | | Huaizhi | 5 |
| | | long | | | | Chenzi | 7 |
| **27. (*) (+)** | **MS** | **Inflorescence: width** | | | | | |
| **QN** | **(d)** | narrow | | | | Xuehuaizi | 1 |
| | | medium | | | | Guiwei | 2 |
| | | broad | | | | Chenzi | 3 |
| **28. (*)** | **MS** | **Inflorescence: ratio length/width** | | | | | |
| **QN** | **(d)** | small | | | | Heiye | 3 |
| | | medium | | | | Huaizhi | 5 |
| | | large | | | | Xuehuaizi | 7 |
| **29. (+)** | **VG** | **Inflorescence: density of branching** | | | | | |
| **QN** | **(d)** | sparse | | | | Chenzi | 3 |
| | | medium | | | | Nuomici | 5 |
| | | dense | | | | Shuijingqiu | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **30.** | **VG** | **Inflorescence: density of floretes** | | | | | |
| **QN** | **(d)** | sparse | | | | Zhumuru | 3 |
| | | medium | | | | Guiwei | 5 |
| | | dense | | | | Sanyuehong | 7 |
| **31.** | **VG** | **Inflorescence: intensity of green color on main axis** | | | | | |
| **QN** | **(d)** | light | | | | Nuomici | 1 |
| | | medium | | | | Huaizhi | 2 |
| | | dark | | | | Sanyuehong | 3 |
| **32. (*) (+)** | **VG** | **Flower: depth of stigma splitting** | | | | | |
| **QN** | **(d)** | shallow | | | | Chenzi | 1 |
| | | medium | | | | Huaizhi | 2 |
| | | deep | | | | Xuehuaizi | 3 |
| **33. (*) (+)** | **VG** | **Fruit: shape** | | | | | |
| **PQ** | **(e)** | elliptic | elliptic | | | Jinzhong | 1 |
| | | asymmetric heart-shaped | heart-shaped | | | Yuanzhi | 2 |
| | | heart-shaped | ovoid | | | Nuomici | 3 |
| | | ovoid | rounded | | | Huaizhi | 4 |
| | | rounded | | | | Heiye | 5 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **34.**<br>**(*)**<br>**(+)** | **VG** | **Fruit: attitute of shoulders** | IL: Fruit: position of left shoulder | IL: Fruit: position of right shoulder | IL: in ventral view | | |
| **PQ** | **(e)** | two shoulders even | upwards | upwards | | Huaizhi | 1 |
| | | two shoulders down | outwards | outwards | | | 2 |
| | | one shoulder up | downwards | downwards | | Yuanzhi | 3 |
| | | two shoulders up | | | | Nuomici | 4 |
| **35.**<br>**(+)** | **VG** | **Fruit: depth of stalk cavity** | | | | | |
| **QN** | **(e)** | shallow | | | | Guiwei | 1 |
| | | medium | | | | Nuomici | 2 |
| | | deep | | | | Ziniangxi | 3 |
| **36.**<br>**(+)** | **VG** | **Fruit: depth of suture** | | | | | |
| **PQ** | **(e)** | shallow | | | | Yuanzhi | 1 |
| | | medium | | | | Heiye | 2 |
| | | deep | | | | Xuehuaizi | 3 |
| **37.**<br>**(*)** | **VG** | **Fruit: color of skin** | | | | | |
| **PQ** | **(e)** | green and red | | | | Feizixiao, | 1 |
| | | yellow and red | | | | Qingpitian | 2 |
| | | red | | | | Huaizhi | 3 |
| | | purple red | | | | Ziniangxi | 4 |
| | | dark red | | | | Huoshaoben | 5 |
| **38.**<br>**(*)**<br>**(+)** | **VG** | **Fruit: shape of protuberance** | | | | | |
| **PQ** | **(e)** | flattened | | | | Huaizhi | 1 |
| | | domed | | | | Nuomici | 2 |
| | | pyramidal | | | | Guiwei | 3 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **39. (*)** | **VG** | **Fruit: size of protuberance** | | | | | |
| **QN** | **(e)** | small | | | | Chenzi | 1 |
| | | medium | | | | Guiwei | 2 |
| | | large | | | | Baitangying | 3 |
| **40. (*)** | **VG** | **Fruit: tip of protuberance** | | | | | |
| **PQ** | **(e)** | acute | smooth | | | Guiwei | 1 |
| | | blunt | sharp | | | Luhebao | 2 |
| | | obtuse | | | | Baitangying | 3 |
| | | smooth or slightly raised | | | | Nuomici | 4 |
| **41. (*)** | **VG** | **Fruit: size** | | | | | |
| **QN** | **(e)** | very small | | | | Xinxingxiangli | 1 |
| | | small | | | | Chenzi | 3 |
| | | medium | | | | Guiwei, | 5 |
| | | large | | | | Sanyuehong | 7 |
| | | very large | | | | Ziniangxi | 9 |
| **42. (+)** | **VG** | **Fruit: thickness of skin** | | | | | |
| **QN** | **(e)** | thin | | | | Nuomici | 1 |
| | | medium | | | | Baitangying | 2 |
| | | thick | | | | Ziniangxi | 3 |
| **43.** | **VG** | **Fruit: color of flesh** | | | | | |
| **PQ** | **(e)** | opaque | | | | Guiwei | 1 |
| | | yellowish | | | | Xuehuaizi | 2 |
| | | yellow | | | | Wuheli | 3 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **44.**<br>**(*)**<br>**(+)** | **VG** | **Fruit: intensity of brown color on the inner side of arils** | | | | | |
| **QN** | **(e)** | absent or weak | | | | Huaizhi | 1 |
| | | medium | | | | Feizixiao | 2 |
| | | strong | | | | Yuanzhi | 3 |
| **45.**<br>**(+)** | **VG** | **Fruit: juiciness** | | | | | |
| **QN** | **(e)** | weak | | | | Baitangying | 1 |
| | | medium | | | | Heiye | 2 |
| | | strong | | | | Feizixiao | 3 |
| **46.**<br>**(*)**<br>**(+)** | **VG** | **Fruit: ratio of abortive seeds** | | | | | |
| **QN** | **(e)** | low | | | | Nuomici, Xinxingxiangli | 1 |
| | | medium | | | | Feizixiao, Lanzhu | 2 |
| | | high | | | | Chenzi, Heiye | 3 |
| **47.**<br>**(*)**<br>**(+)** | **VG** | **Time of beginning of flowering** | | | | | |
| **QN** | **(d)** | early | | | | Sanyuehong | 3 |
| | | medium | | | | Heiye | 5 |
| | | late | | | | Nuomici | 7 |
| **48.**<br>**(*)** | **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 the upper part of the shoots are just turning green and the terminal autumnal shoots just stop developing.
(c) All observations on the leaf blade should be made on the well developed leaf 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.

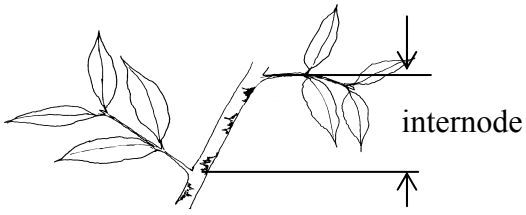
*8.2 Explanations for individual characteristics*

Ad. 2: Plant: shape

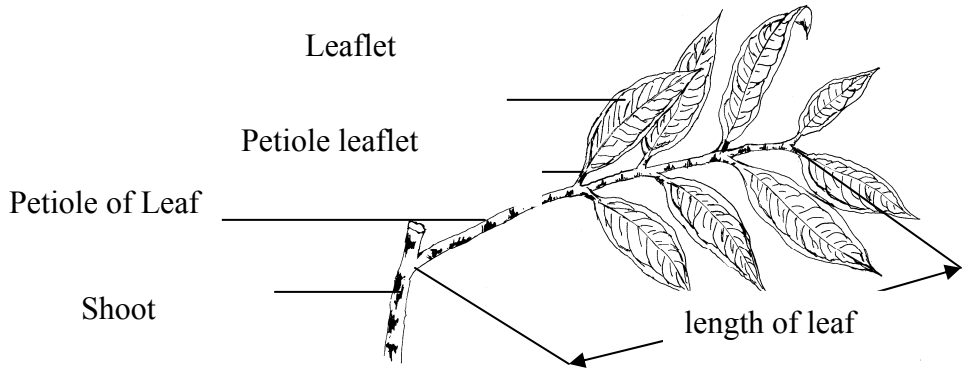
1 spheroid 2 ellipsoid 3 umbrella-shaped 4 irregular

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

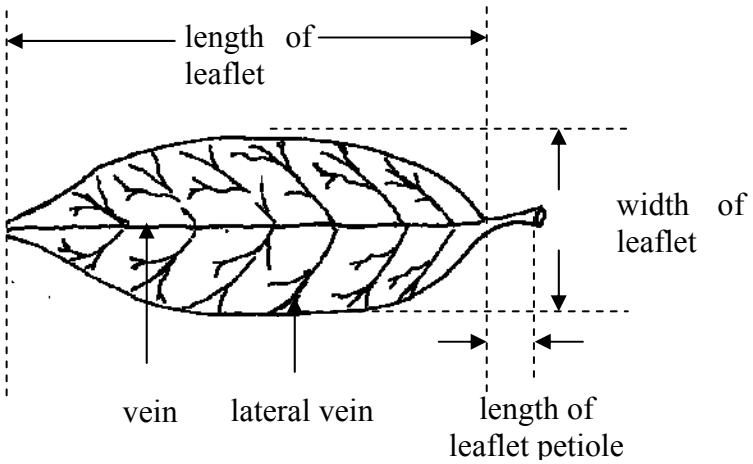
Observing the stems of growing terminal autumnal shoots, especially the nodal portion.



Ad. 10: Leaf: length

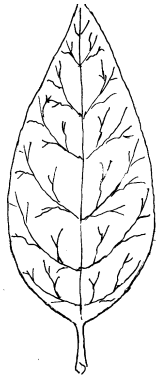
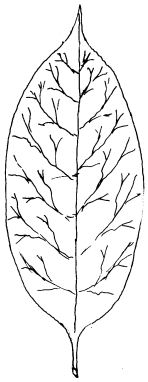
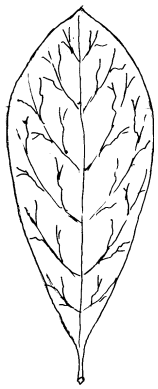



Ad. 12: Leaflet: length of petiole

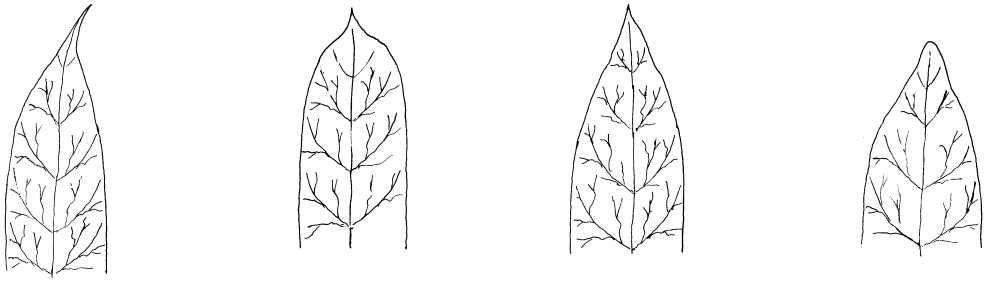


Ad. 13: Leaflet: shape

| ← Broadest part → | | |
|---|---|---|
| Below the middle | At middle | Above middle |

| | | | |
|---|---|---|---|
| broad ↓ width ↑ narrow |  | | |
| | 1<br>lanceolate | | |
| | |  | |
| | | 2<br>oblong | |
| |  |  |  |
| | 4<br>ovate | 3<br>elliptic | 5<br>obovate |

Ad. 20: Leaf blade: shape of apex

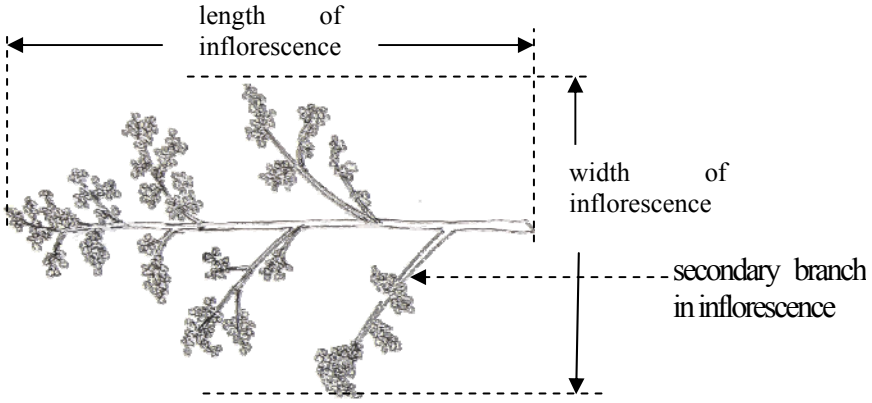


| 1 | 2 | 3 | 4 |
|---|---|---|---|
| caudate | acuminate | acute | obtuse |

Ad. 22: Leaf blade: undulation of margin

| 1 | 3 | 5 |
|---|---|---|
| absent or very weak | weak | medium |

Ad. 27: Inflorescence: width



Ad. 29: Inflorescence: density of branching
The density of secondary branch is observed on the first nodes in Inflorescences.

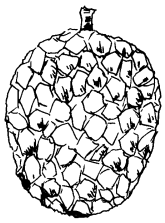
Ad. 32: Flower: depth of stigma splitting

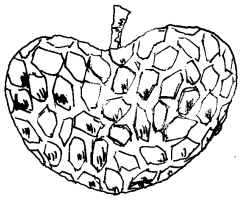

1 shallow


2 medium

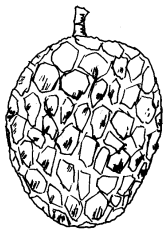

3 deep

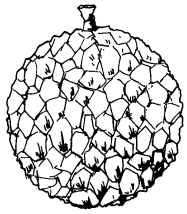
Ad. 33: Fruit: shape


1 elliptic

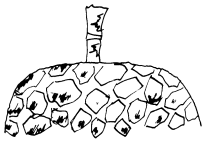

2 asymmetric heart-shaped

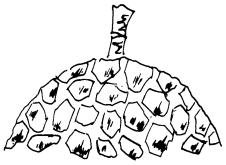

3 heart-shaped

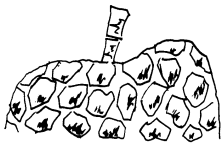

4 ovoid

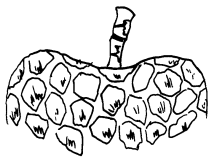

5 rounded

Ad. 34: Fruit: attitude of shoulders


1 two shoulders even


2 two shoulders down


3 one shoulder up


4 two shoulders up

Ad. 35: Fruit: depth of stalk cavity

1 shallow

2 medium

3 deep

Ad. 36: Fruit: depth of suture

1 shallow

2 medium

3 deep

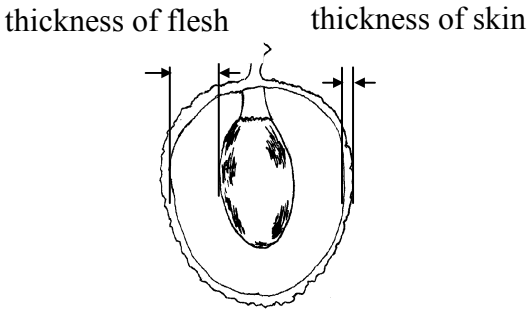
Ad. 38: Fruit: shape of protuberance

1 flattened

2 dome shaped

3 pyramidal

Ad. 42: Fruit: thickness of skin




Ad. 44: Fruit: intensity of brown color on the inner side of arils

1 absent or weak 2 medium 3 strong

Ad. 45: Fruit: juiciness

To cut the fruit 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 as the followings:
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. 46 Fruit: ratio of abortive seeds

To 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. 47: Time of beginning of flowering

When 10% of flower panicles have start to have open flowers

## 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., Waite, G.K., 2005: Litchi and Longan, Botany, Production and Uses. CABI Publishing. Nambour, Queensland, AU, pp. 59 to 86.

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

10. Technical Questionnaire

| TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: |
|---|---|---|
| | | Application date:<br>(not to be filled in by the applicant) |

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

In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety.

1. Subject of the Technical Questionnaire

| | |
|---|---|
| 1.1 Botanical name | { *Litchi chinensis* Sonn } |
| 1.2 Common name | { Litchi } |

2. Applicant

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

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

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

(b) 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: |
|---|---|---|

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) grafting (budding) [ ]

(c) *in vitro* propagation [ ]

(d) 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 (37)** | **Fruit: skin color** | | |
| | green and red | Feizixiao, | 1 |
| | yellow and red | Qingpitian | 2 |
| | red | Huaizhi | 3 |
| | purple red | Ziniangxi | 4 |
| | dark red | Huoshaoben | 5 |
| **5.2 (38)** | **Fruit: appearance of fruit skin segments** | | |
| | smooth | Huaizhi | 1 |
| | swelling raised | Nuomici | 2 |
| | sharp pointed | Guiwei | 3 |
| **5.3 (41)** | **Fruit: size** | | |
| | very small | Xinxingxiangli | 1 |
| | very small-small | | 2 |
| | small | Chenzi | 3 |
| | small-medium | | 4 |
| | medium | Guiwei, | 5 |
| | medium-large | | 6 |
| | large | Sanyuehong | 7 |
| | large-very large | | 8 |
| | very large | Ziniangxi | 9 |

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

| | Characteristics | Example Varieties | Note |
|---|---|---|---|
| **5.4 (47)** | **Time of beginning of flowering** | | |
| | early | Sanyuehong | 3 |
| | medium | Heiye | 5 |
| | late | Nuomici | 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* | *[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 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 [ ]

(b) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated "yes".

……

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]
(please provide details as specified by the Authority)

No [ ]

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]