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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

ADZUKI BEAN *

UPOV Code: VIGNA_ANG

Vigna angularis (Willd.) Ohwi & H. Ohashi

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Japan

to be considered by the

Technical Working Party for Agricultural Crops
at its forty-second session, to be held in Kyiv, Ukraine, from June 17 to 21, 2013

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Vigna angularis (Willd.) Ohwi & H. Ohashi	Adzuki bean, Adzuki red bean, Chinese red bean	Haricot rouge	Rote Bohne, Adzuki Bohne	Frijol rojo, Habichuela

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 *Vigna angularis* (Willd.) Ohwi & H. Ohashi.

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:

500g of seed.

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 two independent 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.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

3.4 Test Design

Each test should be designed to result in a total of at least 100 plants, which should be divided between at least 2 or more replicates.

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 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1.

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 100 plants, 3 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 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) Pod: color (characteristic 12)
(b) Time of maturity (characteristic 13)
(c) Seed: shape (characteristic 15)
(d) Seed: main color of seed coat (characteristic 17)
(e) Seed: 100 seed weight (characteristic 20)

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)-(b) See Explanations on the Table of Characteristics in Chapter 8.1

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

09-99 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.	**VG**	**Plant: growth type**					
QL		dwarf				Erimo-shozu	1
		climbing				Tsuru-shozu	2
2. **(+)**	**89** **MS**	**Plant: number of branches**					
QN		few				Beni-dainagon	3
		medium				Erimo-shozu	5
		many				Akane-dainagon, Toyomi-dainagon	7
3. **(*)** **(+)**	**85** **MS**	**Stem: length**					
QN		short				Kitaroman, Sahoro-shozu	3
		medium				Erimo-shozu, Miama-dainagon	5
		long				Kita-asuka	7
4.	**89** **MS**	**Stem: number of nodes**					
QN		few				Toyomi-dainagon	3
		medium				Erimo-shozu	5
		many				Akane-dainagon	7
5. **(*)** **(+)**	**65** **VG**	**Stem: anthocyanin coloration**					
QL		absent				Erimo-shozu	1
		present				Buchishoryu-kei No.1, Kuro-shozu	9
6. **(+)**	**65** **MS**	**Terminal leaflet: ratio length/width**					
QN	**(a)**	small					3
		medium				Erimo-shozu	5
		large					7
7. **(*)** **(+)**	**65** **VG**	**Terminal leaflet: lobing**					
QL	**(a)**	absent				Erimo-shozu	1
		present				Buchishoryu-kei No.1, Kensaki-shozu,	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. **(+)**	**65** **VG**	**<u>Lobed varieties only</u>:** **Terminal leaflet: depth of sinus**					
QN	**(a)**	shallow					3
		medium				Buchishoryu-kei No.1	5
		deep				Kensaki-shozu	7
9. **(*)**	**65** **MG**	**Time of flowering**					
QN		early					3
		medium				Erimo-shozu	5
		late				Maruba-No.1	7
10.	**88** **MS**	**Pod: length**					
QN	**(a)**	short				Akane-dainagon, Kitahotaru	3
		medium				Erimo-shozu	5
		long				Beni-dainagon	7
11.	**88** **MS**	**Pod: width**					
QN	**(a)**	narrow				Buchishoryu-kei No.1	3
		medium				Erimo-shozu	5
		broad				Akane-dainagon	7
12. **(*)** **(+)**	**88** **VG**	**Pod: color**					
QN	**(a)**	light beige				Akane-dainagon, Toyomi-dainagon	1
		light brown				Hikari-shozu	2
		medium brown				Erimo-shozu	3
		dark brown				Buchishoryu-kei No.1, Maruba-No.1	4
13. **(*)**	**88** **MG**	**Time of maturity**					
QN		early				Sahoro-shozu	3
		medium				Erimo-shozu	5
		late				Homare-dainagon	7
14.	**99** **MS**	**Pod: number of seeds**					
QN	**(b)**	few				Akane-dainagon	3
		medium				Erimo-shozu	5
		many				Beninanbu, Buchishoryu-kei No.1	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15. (*) (+)	**99 VG**	**Seed: shape**					
PQ		short cylindrical				Toyomi-dainagon	1
		cylindrical				Erimo-shozu	2
		long cylindrical				Yume-dainagon	3
		tapered cylindrical				Akane-dainagon	4
16.	**99 VG**	**Seed: variegation of seed coat**					
QL		absent				Erimo-shozu	1
		present				Aneko-kei No. 1, Buchishoryu-kei No. 1	9
17. (*) (+)	**99 MS**	**Seed: main color of seed coat**					
PQ		yellowish white				Kitahotaru	1
		yellowish brown				Kaihaku-kei No.2	2
		green				Midori	3
		brown				Cha-shozu	4
		light red				Erimo-shozu, Kita-no-otome	5
		medium red				Buchishoryu-kei No.1, Homare-dainagon, Sahoro-shozu	6
		dark red				Akane-dainagon	7
		black				Kuro-shozu	8
18. (+)	**99 VG**	**<u>Bi-colored varieties only:</u> Type of variegation of seed coat**					
PQ		blotched				Aneko- kei No.1	1
		mottled				Buchishoryu-kei No.1	2
19.	**99 VG**	**<u>Bi-colored varieties only:</u> Color of variegation of seed coat**					
PQ		red				Aneko- kei No.1	1
		black				Buchishoryu-kei No.1	2

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**99 MG**	**Seed: 100 seed weight**					
QN		very low					1
		very low to low				Buchishoryu-kei No.1	2
		low					3
		low to medium				Kitahotaru	4
		medium				Erimo-shozu	5
		medium to high					6
		high				Akane-dainagon	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:

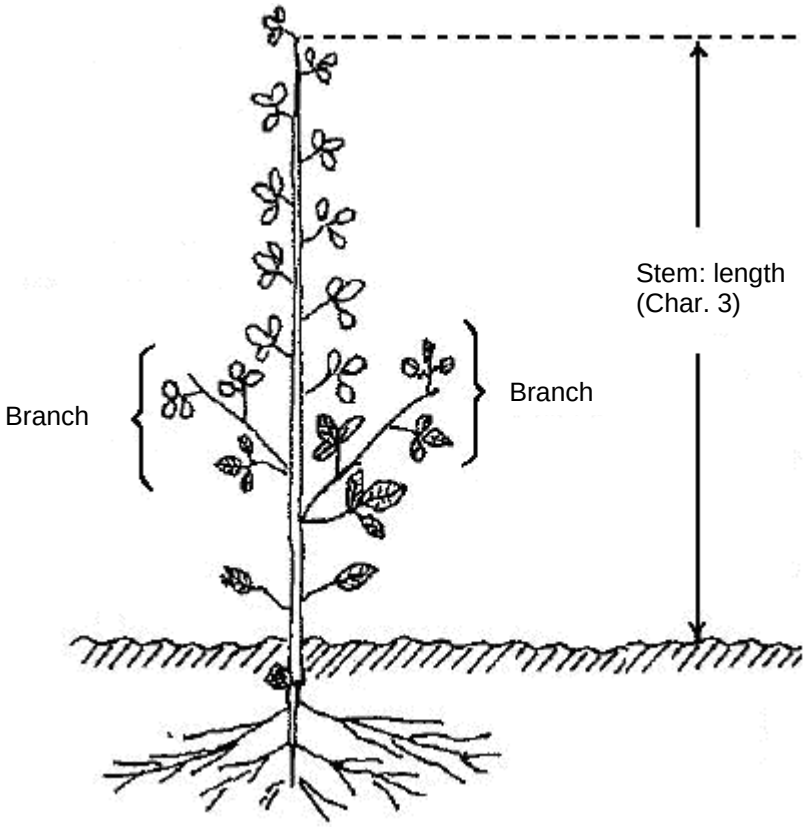
(a) All observations on leaves should be observed on leaves from the middle part of the plant.
(b) All observations on pods should be observed on pods from the middle part of the plant.

8.2 Explanations for individual characteristics

Ad. 2: Plant: number of branches

To count number of primary branches with more than one node.

Ad. 3: Stem: length

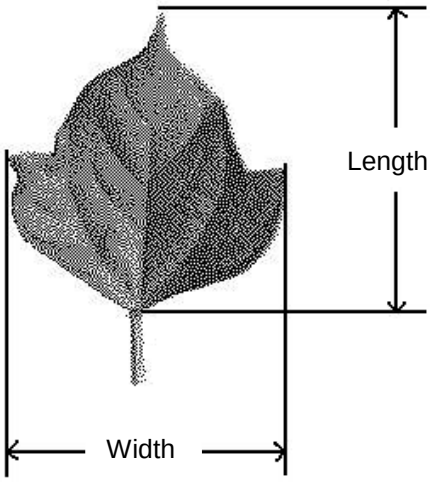


Ad. 5: Stem: anthocyanin coloration

1
absent

9
present

Ad. 6: Terminal leaflet: ratio length/width

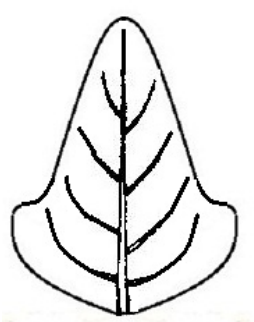


Ad. 7: Terminal leaflet: lobing

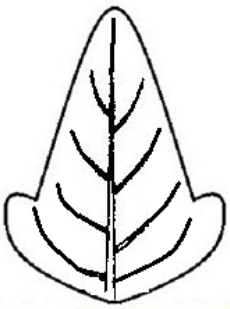
1
absent

9
present

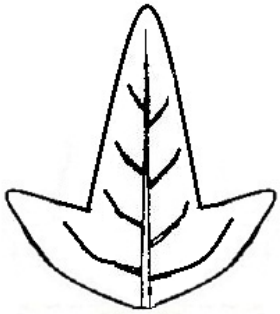
Ad. 8: Lobed varieties only: Terminal leaflet: depth of sinus



3
shallow



5
medium



7
deep

Ad. 12: Pod: color

To be observed at time of maturity

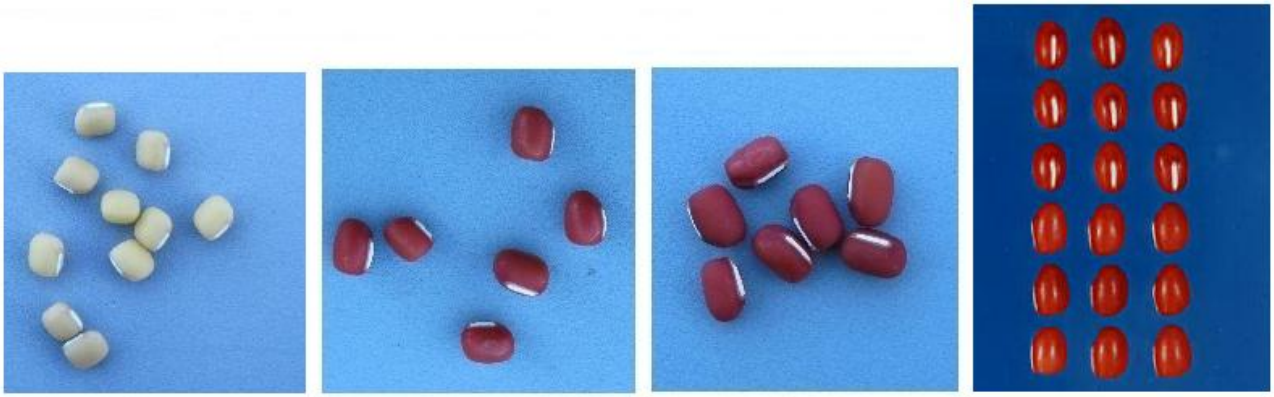
1
light beige

2
light brown

3
medium brown

4
dark brown

Ad. 15: Seed: shape



1
short cylindrical

2
cylindrical

3
long cylindrical

4
tapered cylindrical

Ad. 17: Seed: main color of seed coat

Main color is the color of the largest area in bi-colored varieties.

Ad. 18: Bi-colored varieties only: Type of variegation of seed coat

1
blotched

2
mottled

8.3 Phenological growth stages

Code	*Description*
Principal growth stage 6 65	Flowering Full flowering: about 50% of flowers open
Principal growth stage 8 85 88 89	Ripening or maturity of fruit and seed Advanced ripening; about 50% of pods are ripe; beans final color, dry and hard. 80% of pods are ripe, beans final color, dry and hard Full maturity: approximately all pods are ripe; beans final color, dry and hard (= Harvest maturity)
Principal growth stage 9 99	Senescence Harvested product(seeds)

9. Literature

Narikawa, T., Takeuchi, T., *etc*., 1985: Adzuki Bean. Nosan Gyoson Bunka Kyokai (Nobunkyo), Tokyo, JP

Nomura, N., Nakamura, S., Tsuchiya, T., *etc*., 1991: Varieties of Beans in Hokkaido (enlarged edition). Japan Legume Crops Fund Association. Tokyo, JP, pp. 159-205.

Ministry of Agriculture, Forestry & Fisheries, 1981: National Test Guideline for Adzuki Bean. 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	*Vigna angularis* (Willd.) Ohwi & H. Ohashi
1.2 Common name	Adzuki bean, Adzuki red bean, Chinese red bean

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 Seed-propagated varieties

(a) Self-pollination [ ]

(b) 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 (12)	**Pod: color**		
	light beige	Akane-dainagon, Toyomi-dainagon	1[ ]
	light brown	Hikari-shozu	2[ ]
	medium brown	Erimo-shozu	3[ ]
	dark brown	Buchishoryu-kei No.1, Maruba-No.1,	4[ ]
5.2 (13)	**Time of maturity**		
	very early		1[ ]
	very early to early		2[ ]
	early	Sahoro-shozu	3[ ]
	early to medium		4[ ]
	medium	Erimo-shozu	5[ ]
	medium to late		6[ ]
	late	Homare-dainagon	7[ ]
	late to very late		8[ ]
	very late		9[ ]
5.3 (15)	**Seed: shape**		
	short cylindrical	Toyomi-dainagon	1[ ]
	cylindrical	Erimo-shozu	2[ ]
	long cylindrical	Yume-dainagon	3[ ]
	tapered cylindrical	Akane-dainagon	4[ ]

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

	Characteristics	Example Varieties	Note
5.4 (17)	**Seed: main color of seed coat**		
	yellowish white	Kitahotaru	1[ ]
	yellowish brown	Kaihaku-kei No.2	2[ ]
	green	Midori	3[ ]
	brown	Cha-shozu	4[ ]
	light red	Erimo-shozu, Kita-no-otome	5[ ]
	medium red	Buchishoryu-kei No.1, Homare-dainagon, Sahoro-shozu	6[ ]
	dark red	Akane-dainagon	7[ ]
	black	Kuro-shozu	8[ ]
5.5 (20)	**Seed: 100 seed weight**		
	very low		1[ ]
	very low to low	Buchishoryu-kei No.1	2[ ]
	low		3[ ]
	low to medium	Kitahotaru	4[ ]
	medium	Erimo-shozu	5[ ]
	medium to high		6[ ]
	high	Akane-dainagon	7[ ]
	high to very high		8[ ]
	very high		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	*Stem: length*	*short*	*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

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]