TG/FAGOP(proj.2)
ORIGINAL: English
DATE: 2008-06-03

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

BUCKWHEAT

UPOV Code: FAGOP_ESC

Fagopyrum esculentum Moench [*]

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 thirty-seventh session, to be held in Nelspruit, South Africa, from July 14 to 18, 2008

Alternative Names:[*]

Botanical name	*English*	*French*	*German*	*Spanish*
Fagopyrum esculentum Moench	Buckwheat	Blé noir, Sarrasin	Buchweizen	Alforfón

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

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

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

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Fagopyrum esculentum* Moench.

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

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

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

2.6 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 Type of observation

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

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

3.4 Test Design

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

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations on single plants should be made on 60 plants or parts taken from each of 60 plants and any other observations made on all plants in the test. 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.

3.6 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The 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.

4.2 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 The assessment of uniformity should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.3 Stability

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

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

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness 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) Plant: height (characteristic 4)
(b) Inflorescence: flower color (characteristic 16)
(c) Seed: color (characteristic 25)

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 States of Expression and Corresponding Notes

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

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

(*) Asterisked characteristic – see 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 3.3.2

(a)-(d) 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.	**09 VG**	**Cotyledon: anthocyanin coloration**	**(New)**				
QL		absent				Aelita	1
		present				Rubra	9
2.	**09 VG**	**Cotyledon: intensity of anthocyanin coloration**	**(New)**				
QN		weak				Astoria	3
		medium					5
		strong				Rubra	7
3 (+)	**51 VS**	**Plant: angle of branch with main stem**					
PQ	**(a)**	upright short				Shinano-natsusoba	1
		upright long				Shinano No.1	2
		spreading short					4
		spreading long				Miyazaki-ohtsubu	3
4 (*) (+)	**65 MS/ MG**	**Plant: height**					
QN	**(b)**	short				Shinano-natsusoba	3
		medium				Shinano No.1	5
		tall				Miyazaki-ohtsubu	7
5. (*) (+)	**65 MS/ VG**	**Plant: number of primary branches**					
QN	**(b)**	few				Kitawase-soba	3
		medium				Shinano No.1	5
		many				Takane ruby	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. **(+)**	**78 MS**	**Plant: length of main stem**					
QN	**(c)**	short				Shinano-natsusoba	3
		medium				Shinano No.1	5
		long					7
7. **(*)**	**78 MS/ VG**	**Stem: number of nodes on main stem**					
QN	**(c)**	few				Shinano-natsusoba	3
		medium				Shinano No.1	5
		many				Takane ruby	7
8. **(+)**	**78 VG**	**Stem: diameter**					
QN	**(c)**	small				Shinano-natsusoba	3
		medium				Shinano No.1	5
		large					7
9.	**78 VG**	**Stem: anthocyanin coloration**					
QN	**(c)**	absent or very weak					1
		weak				Shinano-natsusoba	3
		medium				Takane ruby	5
		strong				Shinei-red	7
10.	**65 MS/ VG**	**Leaf blade: length**					
QN	**(b)**	short					3
		medium				Shinano No.1	5
		long					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	**65 MS/ VG**	**Leaf blade: width**					
QN	**(b)**	narrow					3
		medium				Shinano No.1	5
		broad					7
12.	**65 VG**	**Leaf blade: intensity of green color**					
QN	**(b)**	light				Takane ruby	3
		medium				Shinano No.1	5
		dark				Miyazaki-ohtsubu	7
13.	**51 VG**	**Leaf blade: anthocyanin coloration**	**(New)**				
QN	**(a)**	absent or weak				Shinano No.1	1
		medium					2
		strong					3
14. **(+)**	**65 VG**	**Leaf blade: shape**	**(New)**				
PQ	**(b)**	ovate					1
		hastate					2
		sagittate					3
		cordate				Shinano-natsusoba	4
15. **(*)** **(+)**	**51 MG**	**Time of flowering**					
QN	**(a)**	early				Kitawase-soba	3
		medium				Shinano No.1, Shinano-natsusoba	5
		late				Shinei-red	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16. (*)	**65 VG**	**Inflorescence:flower color**					
PQ	**(b)**	light green				Zelenotsvetkovaya 90	1
		white				Shinano No.1	2
		light red				Shinei red	3
		medium red				Takane ruby	4
		dark red					5
17. (+)	**65 VG**	**Inflorescence: number of flower clusters**					
QN	**(b)**	few				Shinano-natsusoba	3
		medium				Shinano No.1	5
		many					7
18.	**65 MG**	**Inflorescence: length of peduncle**	**(New)**				
QN	**(b)**	short					3
		medium					5
		long					7
19. (+)	**65 VG**	**Inflorescence: density of flower clusters on tip of main stem**	**(New)**				
QN	**(b)**	sparse				Peremyshlyanskaya	3
		medium				Vitoria, Aelita	5
		dense				Grushevskaya	7
20.	**65 VG**	**Inflorescence: anthocyanin coloration of bud**	**(New)**				
QN	**(b)**	absent or very weak					1
		weak					3
		medium					5
		strong					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21. (*)	**MG**	**Time of maturity**					
QN	**(c)**	early				Shinano-natsusoba	3
		medium				Shinano No.1	5
		late				Shinei red	7
22. (+)	**00 VG**	**Seed: shape**					
PQ	**(d)**	elliptic					1
		ovate					2
		triangular				Shinano No.1	3
		alate					4
23.	**00 MS**	**Seed: length**					
QN	**(d)**	short					3
		medium				Shinano No.1	5
		long					7
24.	**00 MS**	**Seed: width**					
QN	**(d)**	narrow					3
		medium				Shinano-natsusoba	5
		broad					7
25. (*)	**00 VG**	**Seed: color**					
PQ	**(d)**	whitish					1
		grey					2
		medium brown				Takane ruby	3
		dark brown				Shinano No.1	4
		black				Shinano-natsusoba	5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26. (*)	**00 MG**	**Seed: weight per 1000 seeds**					
QN	**(d)**	low				Shinei red	3
		medium				Shinano No.1	5
		high				Kitawase-soba	7

8. Explanations on the Table of Characteristics

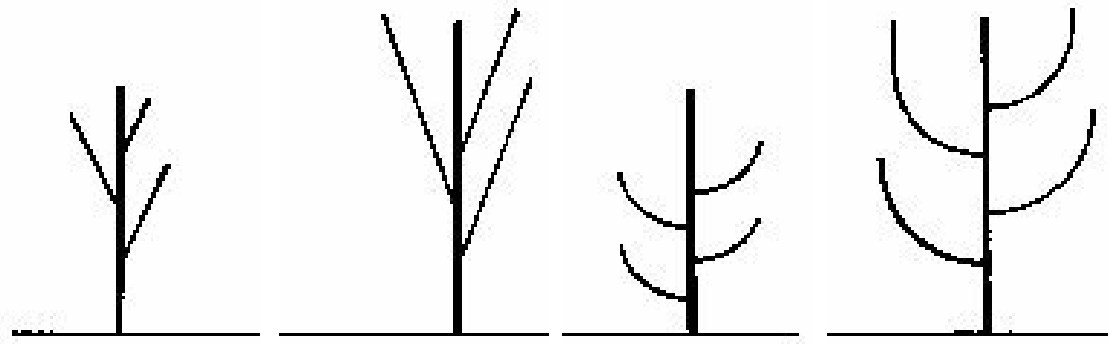
8.1 Explanations covering several characteristics

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

(a) Observations should be made at beginning of inflorescence emergence
(b) Observations should be made at full flowering: 50% of flowers open
(c) Observations should be made at physiological maturity: 80% of seed mature
(d) Observations should be made on dry seeds at harvest time

8.2 Explanations for individual characteristics

Ad. 3: Plant: angle of branch with main stem

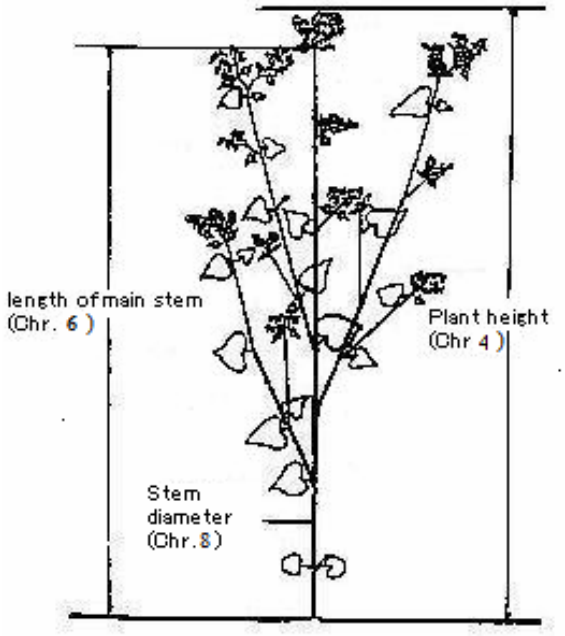


1	2	3	4
upright short	upright long	spreading short	spreading long

Ad. 4: Plant: height

To be measured on the main stem from the ground level to flower cluster on the tip.

Ad. 4: Plant: height
Ad. 6: Plant: length of main stem
Ad. 8: Stem: diameter



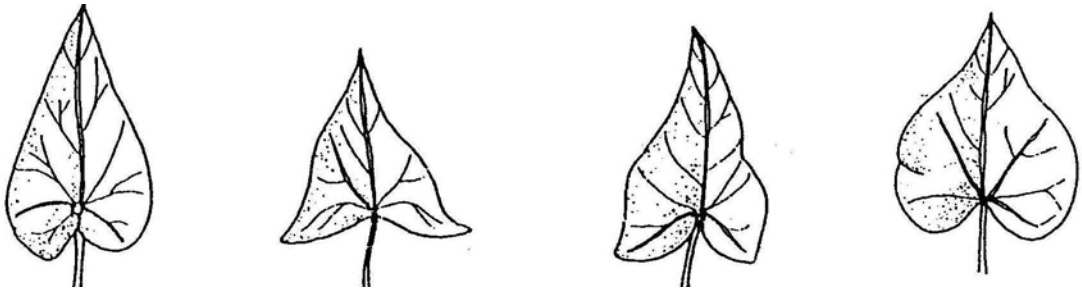
Ad. 5: Plant: number of primary branches

Only primary branches with more than two nodes to be counted.

Ad. 8: Stem: diameter

To be measured on central part of internode between first and second node on main stem.

Ad. 14: Leaf blade: shape



1	2	3	4
ovate	hastate	sagittate	cordate

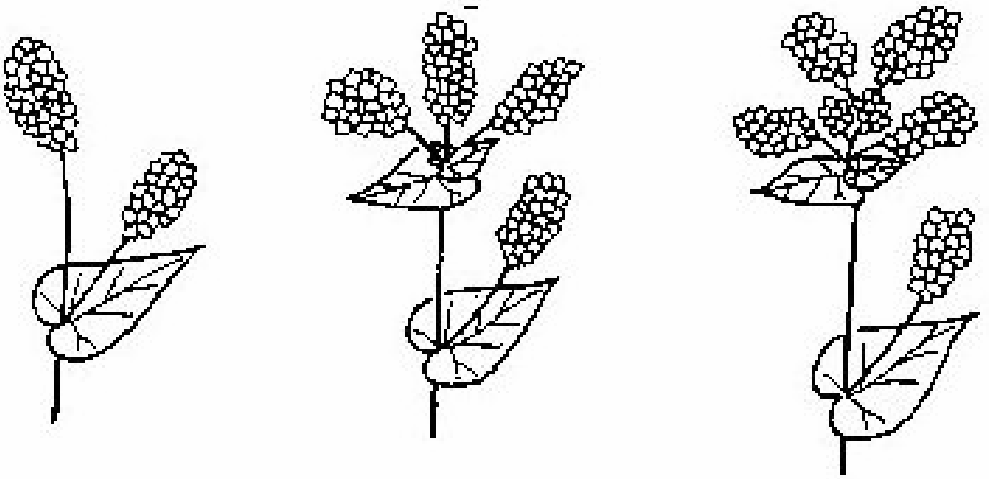
Ad. 15: Time of flowering

Time of flowering is the time of beginning of inflorescence emergence.

Ad. 17: Inflorescence: number of flower clusters

To be excluded the flower clusters on tip of main stem.

Ad. 19: Inflorescence: density of flower clusters on tip of main stem

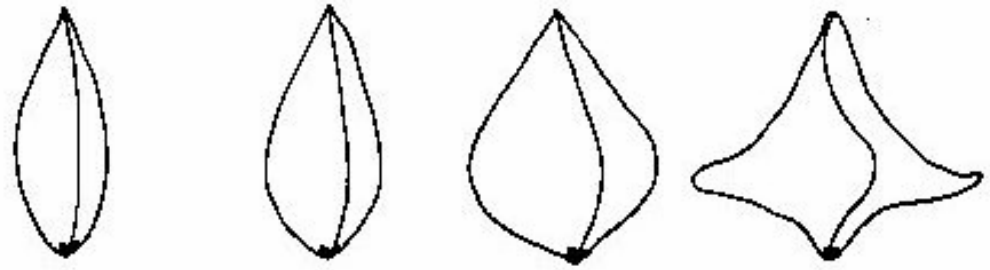


3
sparse

5
medium

7
dense

Ad. 22: Seed: shape



1
elliptic

2
ovate

3
triangular

4
alate

8.3 Phenological growth stages

Code	*Description*
Principal growth stage 0	**Sprouting**
00	Dry seed
09	Emergence: Cotyledons break through soil surface
Principal growth stage 5	**Inflorescence emergence**
51	Inflorescence buds visible
Principal growth stage 6	**Flowering**
65	Full flowering: about 50% of flowers open
Principal growth stage 7	**Development of seed**
78	80% of seeds mature

9. Literature

Hayashi, H., Honda, Y., Katsuta, M., *etc*., 2004: Varieties of Buckwheat. The Japan Buckwheat Association. Tokyo, Japan

Hoshikawa, K., 1980: Buckwheat in New Agricultural Crops. Yokendo. Tokyo, Japan, pp 400-409.

Shigemori, I., Honda, Y., *etc*., 2003: Test Guideline for Buckwheat. Ando. Nagano, Japan, pp 5-47.

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	*Fagopyrum esculentum* Moench
1.2 Common name	Buckwheat

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

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

(c) 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)

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Cross-pollination [ ]

(b) Other [ ]
(please provide details)

4.2.2 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:

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

	Characteristics	Example Varieties	Note
5.1 (4)	**Plant: height**		
	short	Shinano-natsusoba	3 [ ]
	medium	Shinano No.1	5 [ ]
	tall	Miyazaki-ohtsubu	7 [ ]
5.2 (5)	**Plant: number of primary branches**		
	few	Kitawase-soba	3[ ]
	medium	Shinano No.1	5[ ]
	many	Takane ruby	7[ ]
5.3 (7)	**Stem: number of nodes on main stem**		
	few	Shinano-natsusoba	3 [ ]
	medium	Shinano No.1	5 [ ]
	many	Takane ruby	7 [ ]
5.4 (15)	**Time of flowering**		
	early	Kitawase-soba	3 [ ]
	medium	Shinano No.1, Shinano-natsusoba	5 [ ]
	late	Shinei red	7 [ ]
5.5 (16)	**Inflorescence: flower color**		
	light green	Zelenotsvetkovaya	1 [ ]
	white	Shinano No.1	2 [ ]
	light red	Shinei red	3 [ ]
	medium red	Takane ruby	4 [ ]
	dark red		5 [ ]

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

	Characteristics	Example Varieties	Note
5.6 (21)	**Time of maturity**		
	early	Shinano-natsusoba	3 [ ]
	medium	Shinano No.1	5 [ ]
	late	Shinei red	7 [ ]
5.7 (25)	**Seed: color**		
	whitish		1 [ ]
	grey		2 [ ]
	medium brown	Takane ruby	3 [ ]
	dark brown	Shinano No.1	4 [ ]
	black	Shinano-natsusoba	5 [ ]
5.8 (26)	**Seed: weight per 1000 seeds**		
	low	Shinei red	3 [ ]
	medium	Shinano No.1	5 [ ]
	high	Kitawase-soba	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	*Plant: height*	*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]