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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

PISTACHIO

UPOV Code(s): PISTA_VER

Pistacia vera L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from European Union

to be considered by the

Technical Committee at its fifty-seventh session
to be held in Geneva on October 25 and 26, 2021

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Pistacia vera L.	Pistachio, Green-almond	Pistachier, Pistache, Pistachier cultivé	Echte Pistazie, Pistazie, Pistazienbaum	Alfónsigo, Pistachero

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

1.1 These Test Guidelines apply to all varieties of *Pistacia vera* L.

1.2 Guidance on the use of Test Guidelines for interspecific hybrids that are not explicitly covered by Test Guidelines is provided in document TGP/13 “Guidance for New Types and Species”.

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 plants on their own roots or grafted plants on a rootstock specified by the testing authority.

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

5 plants on their own roots or,
5 plants on a rootstock specified by the testing authority.

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 For female varieties, the minimum duration of tests should normally be two independent growing cycles. The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

3.1.2 For male varieties, the minimum duration of tests is one observation cycle provided there is sufficient flowering.

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

3.1.4 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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 For female varieties, the competent authority should ensure that an appropriate male variety is available for adequate pollination.

3.4 Test Design

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

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts of plants taken from each of 5 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 6.

4.1.5 Method of Observation

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

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

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

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

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

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

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

4.2 Uniformity

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

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

4.2.3 For the assessment of uniformity of vegetatively propagated varieties, 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) Plant: sex (characteristic 1)
(b) Plant: growth habit (characteristic 3)
(c) Terminal leaflet: shape of apex (characteristic 12)
(d) Nut: shape in lateral view (characteristic 24)
(e) Time of beginning of vegetative bud burst (characteristic 35)
(f) Time of beginning of flowering (characteristic 36)
(g) Time of harvest maturity (characteristic 37)

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 All relevant states of expression are presented in the characteristic.

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

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

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

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

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

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

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

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

7 Not applicable

(f) = female varieties
(m) = male varieties

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*)**	**QL VG**					
		Plant: sex	**Plante : sexe**	**Pflanze: Geschlecht**	**Planta: sexo**		
		female	femelle	weiblich	femenino	Kerman (f), Larnaka (f)	1
		male	mâle	männlich	masculino	Peters (m), Randy (m)	2
2.	**(*)**	**QN VG**	**(+) (a)**				
		Plant: vigor	**Plante : vigueur**	**Pflanze: Wuchsstärke**	**Planta: vigor**		
		weak	faible	gering	débil	Avidon (f), Bronte (f)	1
		medium	moyenne	mittel	medio	Kerman (f)	2
		strong	forte	stark	fuerte	Boundoky (f), Mateur (f)	3
3.	**(*)**	**PQ VG**	**(+) (a)**				
		Plant: growth habit	**Plante : port**	**Pflanze: Wuchsform**	**Planta: hábito de crecimiento**		
		upright	dressé	aufrecht	erecto	Ouleimy (f)	1
		spreading	étalé	breitwüchsig	extendido	Larnaka (f)	2
		drooping	retombant	überhängend	colgante	Insolia (f), Joley (f)	3
4.	**(*)**	**QN VG**	**(+)**				
		Plant: density of canopy	**Plante : densité du feuillage**	**Pflanze: Dichte des Laubes**	**Planta: densidad de la copa**		
		sparse	lâche	locker	laxa	Mateur (f)	1
		medium	moyenne	mittel	media	Kerman (f)	2
		dense	dense	dicht	densa		3
5.		**QN VG**					
		Young shoot: intensity of anthocyanin coloration of growing tip	**Jeune pousse : pigmentation anthocyanique du sommet de croissance**	**Jungtrieb: Intensität der Anthocyanfärbung der Triebspitze**	**Rama joven: intensidad de la pigmentación antociánica del ápice de crecimiento**		
		absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Mateur (f)	1
		weak	faible	gering	débil	Chico (m), Randy (m)	2
		medium	moyenne	mittel	media	Enk (m), Napoletana (f)	3
		strong	forte	stark	fuerte	Cerasola (f)	4
		very strong	très forte	sehr stark	muy fuerte	40A (m)	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	**QN** **VG**	**(b)**				
	Leaf: intensity of green color of upper side	**Feuille : intensité de la couleur verte de la face supérieure**	**Blatt: Intensität der Grünfärbung der Oberseite**	**Hoja: intensidad del color verde del haz**		
	light	claire	hell	clara	Napoletana (f)	1
	medium	moyenne	mittel	media	502 (m), Larnaka (f)	2
	dark	foncée	dunkel	oscura	Chico (m)	3
7.	**QN** **MG/MS/VG**	**(b), (c)**				
	Leaf: length of petiole	**Feuille : longueur du pétiole**	**Blatt: Länge des Blattstiels**	**Hoja: longitud del pecíolo**		
	very short	très courte	sehr kurz	muy corta	Bronte (f)	1
	short	courte	kurz	corta	Ask (m), Sfax (f)	2
	medium	moyenne	mittel	media	Greco (f), Mateur (f)	3
	long	longue	lang	larga	Cerasola (f)	4
	very long	très longue	sehr lang	muy larga	Chico (m), Enk (m), Lost Hills (f)	5
8.	**QN** **MG**	**(b)**				
	Leaf: predominant number of leaflets	**Feuille : nombre prédominant de folioles**	**Blatt: vorwiegende Anzahl Blattfiedern**	**Hoja: número predominante de folíolos**		
	less than 6	moins de 6	weniger als 6	menos de 6	Aegina (f)	1
	6 to 10	6 à 10	6 bis 10	6 a 10	Chico (m)	2
	more than 10	plus de 10	mehr als 10	más de 10	Enk (m)	3
9.	**QN** **MS/VG**	**(b), (c)**				
	Terminal leaflet: length	**Foliole terminale : longueur**	**Endblattfieder: Länge**	**Folíolo terminal: longitud**		
	very short	très courte	sehr kurz	muy corta	40A (m), Golden Hills (f)	1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta	Enk (m)	2
	short	courte	kurz	corta		3
	short to medium	courte à moyenne	kurz bis mittel	corta a media	Lost Hills (f)	4
	medium	moyenne	mittel	media	Chico (m)	5
	medium to long	moyenne à longue	mittel bis lang	media a larga	Bronte (f), Napoletana (f)	6
	long	longue	lang	larga	Aegina (f)	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga	Cerasola (f), Larnaka (f)	8
	very long	très longue	sehr lang	muy larga		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.		**QN MS/VG**	**(b), (c)**				
		Terminal leaflet: width	**Foliole terminale : largeur**	**Endblattfieder: Breite**	**Folíolo terminal: anchura**		
		very narrow	très étroite	sehr schmal	muy estrecha	Enk (m), Golden Hills (f)	1
		very narrow to narrow	très étroite à étroite	sehr schmal bis schmal	muy estrecha a estrecha	40A (m)	2
		narrow	étroite	schmal	estrecha		3
		narrow to medium	étroite à moyenne	schmal bis mittel	estrecha a media	Chico (m)	4
		medium	moyenne	mittel	media	Lost Hills (f)	5
		medium to broad	moyenne à large	mittel bis breit	media a ancha	Napoletana (f)	6
		broad	large	breit	ancha	Greco (f)	7
		broad to very broad	large à très large	breit bis sehr breit	ancha a muy ancha	Aegina (f)	8
		very broad	très large	sehr breit	muy ancha	Larnaka (f)	9
11.		**QN MS/VG**	**(b)**				
		Terminal leaflet: ratio length/width	**Foliole terminale : rapport longueur/largeur**	**Endblattfieder: Verhältnis Länge/Breite**	**Folíolo terminal: relación longitud/anchura**		
		very low	très bas	sehr klein	muy baja	Mateur (f)	1
		very low to low	très bas à bas	sehr klein bis klein	muy baja a baja		2
		low	bas	klein	baja		3
		low to medium	bas à moyen	klein bis mittel	baja a media	Kerman (f)	4
		medium	moyen	mittel	media	Chico (m), Napoletana (f)	5
		medium to high	moyen à élevé	mittel bis groß	media a alta	Lost Hills (f)	6
		high	élevé	groß	alta	Golden Hills (f)	7
		high to very high	élevé à très élevé	groß bis sehr groß	alta a muy alta	Larnaka (f)	8
		very high	très élevé	sehr groß	muy alta	Enk (m), Sfax (f)	9
12.	**(*)**	**PQ VG**	**(+) (b)**				
		Terminal leaflet: shape of apex	**Foliole terminale : forme du sommet**	**Endblattfieder: Form der Spitze**	**Folíolo terminal: forma del ápice**		
		acute	aigue	spitz	aguda	Enk (m), Mateur (f)	1
		obtuse	obtuse	stumpf	obtusa		2
		rounded	arrondie	abgerundet	redondeada	Golden Hills (f)	3
		truncate	tronquée	gerade	truncada	Insolia (f)	4
		obcordate	obcordée	verkehrt herzförmig	obcordada		5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**(*)**	**PQ VG**	**(+) (b)**				
		Terminal leaflet: shape of base	**Foliole terminale : forme de la base**	**Endblattfieder: Form der Basis**	**Folíolo terminal: forma de la base**		
		acute	aigue	spitz	aguda	Aegina (f)	1
		rounded	arrondie	abgerundet	redondeada	Lost Hills (f)	2
		truncate	tronquée	gerade	truncada		3
14.		**QN VG**	**(+) (b)**				
		Terminal leaflet: asymmetry at base	**Foliole terminale : asymétrie à la base**	**Endblattfieder: Asymmetrie an der Basis**	**Folíolo terminal: asimetría en la base**		
		absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Lost Hills (f)	1
		medium	moyenne	mittel	media	Aegina (f)	2
		strong	forte	stark	fuerte		3
15.		**PQ VG**					
		<u>Only varieties with Plant: sex female</u>: Flower bud: shape	**<u>Variétés avec Plante : sexe : femelle seulement</u> : Bouton floral : forme**	**<u>Nur Sorten mit Pflanze: Geschlecht: weiblich:</u> Blütenknospe: Form**	**<u>Solo variedades con Planta: sexo: femenino</u>: Botón floral: forma**		
		ovate	ovale	eiförmig	oval	Sfax (f)	1
		circular	circulaire	kreisförmig	circular		2
		elliptic	elliptique	elliptisch	elíptica	Aegina (f)	3
16.		**PQ VG**					
		<u>Only varieties with Plant: sex female:</u> Flower bud: color	**<u>Variétés avec Plante : sexe : femelle seulement</u> : Bouton floral : couleur**	**<u>Nur Sorten mit Pflanze: Geschlecht: weiblich:</u> Blütenknospe: Farbe**	**<u>Solo variedades con Planta: sexo: femenino</u>: Botón floral: color**		
		light brown	brun clair	hellbraun	marrón claro	Bronte (f)	1
		medium brown	brun moyen	mittelbraun	marrón medio	Aegina (f)	2
		dark brown	brun foncé	dunkelbraun	marrón oscuro	Rashti (f)	3
		reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo	Mateur (f)	4
17.		**QN VG**	**(+) (d)**				
		Hull: dehiscence	**Péricarpe : déhiscence**	**Hülse: Aufspringen**	**Pellejo: dehiscencia**		
		weak	faible	gering	débil	Kerman (f), Napoletana (f)	1
		medium	moyenne	mittel	media	Mateur (f)	2
		strong	forte	stark	fuerte	Avidon (f), Larnaka (f)	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.	**(*)**	**QN VG**	**(d)**				
		Hull: prominence of tip	**Péricarpe : proéminence du bec**	**Hülse: Ausbildung der Spitze**	**Pellejo: prominencia de la punta**		
		absent or weak	nulle ou faible	fehlend oder gering	ausente o débil	Kerman (f), Sfax (f)	1
		medium	moyenne	mittel	media	Cerasola (f)	2
		strong	forte	stark	fuerte	Aegina (f), Joley (f), Larnaka (f)	3
19.		**PQ VG**	**(+) (d)**				
		Hull: ground color	**Péricarpe : couleur de fond**	**Hülse: Grundfarbe**	**Pellejo: color de fondo**		
		green white	blanc-vert	grünweiß	blanco verdoso	Aegina (f)	1
		yellow green	vert-jaune	gelbgrün	verde amarillento	Kastel (f)	2
		yellow	jaune	gelb	amarillo	Sfax (f)	3
		yellow orange	orangé-jaune	gelborange	naranja amarillento	Larnaka (f)	4
20.		**QN VG**	**(+) (d)**				
		Hull: area of over color	**Péricarpe : surface du lavis**	**Hülse: Anteil der Deckfarbe**	**Pellejo: superficie del color superficial**		
		absent or very small	absente ou très petite	fehlend oder sehr klein	ausente o muy pequeña	Sfax (f)	1
		small	petite	klein	pequeña		2
		medium	moyenne	mittel	media	Kerman (f)	3
		large	grande	groß	grande		4
		very large	très grande	sehr groß	muy grande	Aegina (f), Cerasola (f)	5
21.	**(*)**	**QN MS/VG**	**(+) (d)**				
		Nut: length	**Noix : longueur**	**Nuss: Länge**	**Nuez: longitud**		
		very short	très courte	sehr kurz	muy corta	Bronte (f), Sfax (f)	1
		short	courte	kurz	corta		2
		medium	moyenne	mittel	media	Mateur (f)	3
		long	longue	lang	larga		4
		very long	très longue	sehr lang	muy larga	Ouleimy (f)	5
22.	**(*)**	**QN MS/VG**	**(+)**				
		Nut: width	**Noix : largeur**	**Nuss: Breite**	**Nuez: anchura**		
		very narrow	très étroite	sehr schmal	muy estrecha		1
		narrow	étroite	schmal	estrecha		2
		medium	moyenne	mittel	media	Cerasola (f)	3
		broad	large	breit	ancha		4
		very broad	très large	sehr breit	muy ancha	Kerman (f)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23.	**(*)**	**QN MS/VG**	**(+)**				
		Nut: thickness	**Noix : épaisseur**	**Nuss: Dicke**	**Nuez: grosor**		
		thin	mince	dünn	delgado	Aegina (f)	1
		medium	moyenne	mittel	media	Cerasola (f)	2
		thick	épais	dick	grueso	Ouleimy (f)	3
24.	**(*)**	**PQ VG**					
		Nut: shape in lateral view	**Noix : forme en vue latérale**	**Nuss: Form in Seitenansicht**	**Nuez: forma en vista lateral**		
		ovate	ovale	eiförmig	oval	Kerman (f)	1
		narrow elliptic	elliptique étroite	schmal elliptisch	elíptica estrecha	Napoletana (f)	2
		broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Sfax (f)	3
25.	**(*)**	**PQ VG**					
		Nut: shape of apex in lateral view	**Noix : forme du sommet en vue latérale**	**Nuss: Form der Spitze in Seitenansicht**	**Nuez: forma del ápice en vista lateral**		
		acute	aigue	spitz	aguda	Aegina (f), Larnaka (f)	1
		rounded	arrondie	abgerundet	redondeada	Bronte (f)	2
		truncate	tronquée	gerade	truncada	Sfax (f)	3
26.	**(*)**	**QL VG**	**(+)**				
		Nut: presence of tip	**Noix : présence d'un bec**	**Nuss: Vorhandensein einer Spitze**	**Nuez: presencia de punta**		
		absent	absent	fehlend	ausente	Kerman (f)	1
		present	présent	vorhanden	presente	Larnaka (f)	9
27.		**QN VG**	**(+)**				
		Nut: depression of shell near pedicel	**Noix : dépression de la coque près du pédicelle**	**Nuss: Einsenkung der Schale am Blütenstiel**	**Nuez: depresión de la cáscara junto al pedicelo**		
		absent or shallow	absente ou peu profonde	fehlend oder flach	nula o poco profunda		1
		medium	moyenne	mittel	medianamente profunda	Mateur (f)	2
		deep	profonde	tief	profunda	Kerman (f)	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28.	**QN** **VG**					
	Nut: intensity of brown color of the shell	**Noix : intensité de la couleur brune de la coque**	**Nuss: Intensität der Braunfärbung der Schale**	**Nuez: intensidad del color marrón de la cáscara**		
	very light	très claire	sehr hell	muy clara	Kerman (f)	1
	light	claire	hell	clara	Aegina (f)	2
	medium	moyenne	mittel	media	Sirora (f)	3
	dark	foncée	dunkel	oscura	Larnaka (f)	4
	very dark	très foncée	sehr dunkel	muy oscura	Avidon (f)	5
29.	**QN** **VG**					
	Nut: position of suture opening	**Noix : position de l'ouverture de la suture**	**Nuss: Position der Nahtöffnung**	**Nuez: posición de la apertura de la sutura**		
	mainly dorsal side	principalement face dorsale	überwiegend Rückenseite	principalmente en la cara dorsal		1
	equally dorsal and ventral side	autant face dorsale que ventrale	gleichermaßen Rücken- und Bauchseite	en las caras dorsal y ventral por igual	Kerman (f)	2
	mainly ventral side	principalement face ventrale	überwiegend Bauchseite	principalmente en la cara ventral	Larnaka (f)	3
30.	**QN** **VG**					
	Nut: width of suture opening	**Noix : largeur de l'ouverture de la suture**	**Nuss: Breite der Nahtöffnung**	**Nuez: anchura de la apertura de la sutura**		
	narrow	étroite	schmal	estrecha	Bronte (f)	1
	medium	moyenne	mittel	media	Mateur (f)	2
	broad	large	breit	ancha	Aegina (f)	3
31.	**QL** **VG**					
	Nut: position of pedicel scar in ventral view	**Noix : position de la cicatrice du pédicelle en vue ventrale**	**Nuss: Position der Blütenstielnarbe in Bauchansicht**	**Nuez: posición de la cicatriz pedicelar en vista ventral**		
	symmetric	symétrique	symmetrisch	simétrica		1
	asymmetric	asymétrique	asymmetrisch	asimétrica	Avdat (f)	2
32.	**QN** **VG**	**(+)**				
	Nut: shell staining	**Noix : coloration de la coque**	**Nuss: Färbung der Schale**	**Nuez: tinción de la cáscara**		
	weak	faible	gering	débil	Aegina (f)	1
	medium	moyenne	mittel	media	Larnaka (f)	2
	strong	forte	stark	fuerte		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33.	**(*)**	**QN MG**	**(+) (d)**				
		Kernel: weight	**Cerneau : poids**	**Kern: Gewicht**	**Grano: peso**		
		low	faible	gering	bajo	Avidon (f), Sfax (f)	1
		low to medium	faible à moyen	gering bis mittel	bajo a medio		2
		medium	moyen	mittel	medio	Larnaka (f), Mateur (f)	3
		medium to high	moyen à élevé	mittel bis hoch	medio a alto		4
		high	élevé	hoch	alto	Kastel (f), Kerman (f)	5
34.		**QN VG**	**(d)**				
		Cotyledon: intensity of green color	**Cotylédon : intensité de la couleur verte**	**Keimblatt: Intensität der Grünfärbung**	**Cotiledón: intensidad del color verde**		
		light	claire	hell	clara	Kerman (f), Lost Hills (f), Rashti (f)	1
		medium	moyenne	mittel	media	Avidon (f), Sfax (f)	2
		dark	foncée	dunkel	oscura	Larnaka (f), Ouleimy (f)	3
35.	**(*)**	**QN MG/VG**	**(+)**				
		Time of beginning of vegetative bud burst	**Époque de début de débourrement**	**Zeitpunkt des Aufbruchs der vegetativen Knospe**	**Época de inicio de la brotación de las yemas vegetativas**		
		very early	très précoce	sehr früh	muy temprana	Aegina (f), Chico (m)	1
		early	précoce	früh	temprana	Larnaka (f)	2
		medium	moyenne	mittel	intermedia	Ask (m), Bronte (f)	3
		late	tardive	spät	tardía	Joley (f)	4
		very late	très tardive	sehr spät	muy tardía	Kerman (f), Peters (m)	5
36.	**(*)**	**QN MG/VG**	**(+)**				
		Time of beginning of flowering	**Époque de début de floraison**	**Zeitpunkt des Blühbeginns**	**Época de inicio de la floración**		
		very early	très précoce	sehr früh	muy temprana	Avidon (f), Mateur (f)	1
		early	précoce	früh	temprana	Larnaka (f)	2
		medium	moyenne	mittel	intermedia	02-18 (m), M-38 (m), Sfax (f)	3
		late	tardive	spät	tardía	Kastel (f)	4
		very late	très tardive	sehr spät	muy tardía	Kerman (f), Peters (m)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37.	**(*)**	**QN** **MG/VG**	**(+)**				
		Time of harvest maturity	**Époque de maturité de récolte**	**Zeitpunkt der Erntereife**	**Época de madurez para la cosecha**		
		very early	très précoce	sehr früh	muy temprana	Avidon (f)	1
		early	précoce	früh	temprana	Golden Hills (f)	2
		medium	moyenne	mittel	intermedia	Napoletana (f)	3
		late	tardive	spät	tardía		4
		very late	très tardive	sehr spät	muy tardía	Kerman (f)	5

8. Explanations on the Table of Characteristics

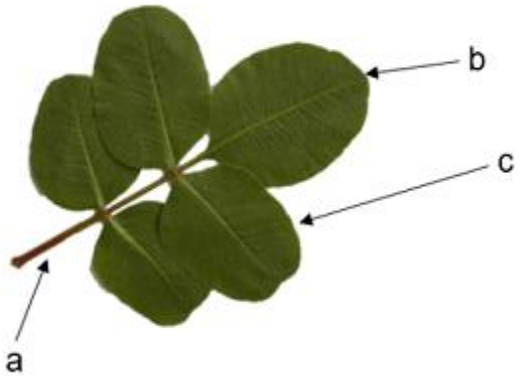
8.1 Explanations covering several characteristics

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

(a) Observations should be made in the dormant season.

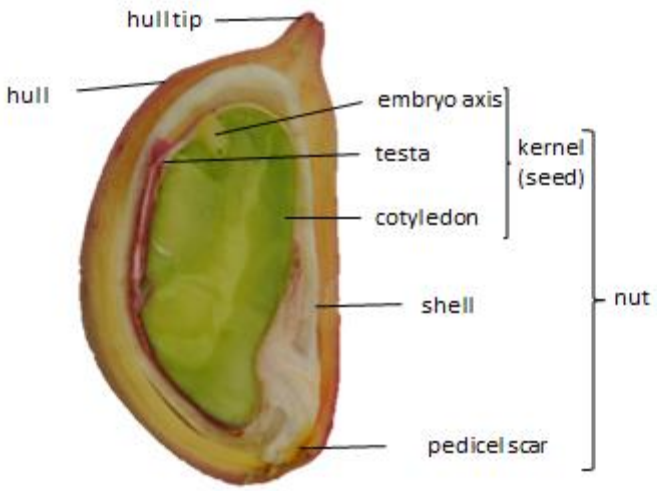
(b) Observations should be made on fully developed leaves from the middle third of current season shoots.

(c)



a = Petiole
b = Terminal leaflet
c = Lateral leaflet

(d) Fruit:



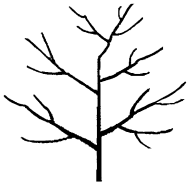
8.2 Explanations for individual characteristics

Ad. 2: Plant: vigor

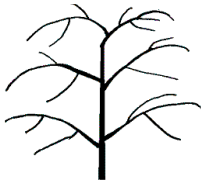
The vigor of the plant should be considered as the overall abundance of vegetative growth.

Ad. 3: Plant: growth habit

1
upright



2
spreading



3
drooping

Ad. 4: Plant: density of canopy

The density of canopy of the plant should be considered as the overall abundance of branches during the dormant period.

Ad. 12: Terminal leaflet: shape of apex

1
acute

2
obtuse

3
rounded

4
truncate

5
obcordate

Ad. 13: Terminal leaflet: shape of base

1
acute

2
rounded

3
truncate

Ad. 14: Terminal leaflet: asymmetry at base

1
absent or weak

2
medium

3
strong

Ad. 17: Hull: dehiscence

Hull dehiscence should be assessed as the degree of separation of the hull from the shell. It is assessed by visual inspection of the fruit and applying pressure with fingers:
1 - weak - it is difficult to separate hull from the nut when pressing with fingers,
2 - medium - hull separates easy from the nut, a layer of air between the hull and nut can be detected when pressing with fingers,
3 - strong - there are visible cracks on the hull and the hull separates very easy from the nut when pressing with fingers.

Ad. 19: Hull: ground color

The ground color is the first color to appear chronologically during the development of the fruit.

Ad. 20: Hull: area of over color

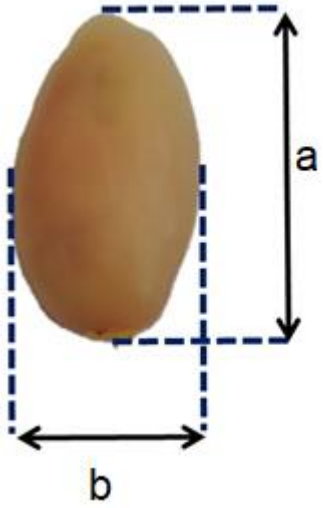
The over color is the second color such as a flush which develops over time upon the ground color.

1
absent or very small

3
medium

5
very large

Ad. 21: Nut: length



a = Nut: length
b = Nut: width

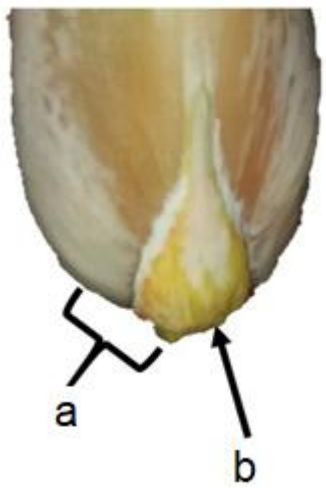
Ad. 22: Nut: width

See Ad. 21

Ad. 23: Nut: thickness

Ad. 26: Nut: presence of tip

Ad. 27: Nut: depression of shell near pedicel



a = Depression
b = Pedicel scar

Ad. 32: Nut: shell staining

The shell staining should be assessed after drying.

Ad. 33: Kernel: weight

Crack 20 nuts at maturity for harvest and assess the average weight of the kernels.

Ad. 35: Time of beginning of vegetative bud burst

The time of beginning of vegetative burst is reached when 10% of terminal buds have enlarged and the bud scales have split showing the green of the leaves.

Ad. 36: Time of beginning of flowering

The time of beginning of flowering is reached:
- for female varieties - when 25% of flower buds are receptive for pollination (stigmas are visible),
- for male varieties - when flowers start spreading pollen.

Ad. 37: Time of harvest maturity

The time of harvest maturity is reached when 50% of fruits are mature.

9. Literature

Couceiro, J.F.; Guerrero, J., Gijón MC., Pérez-López, D.; Moriana, A. and Rodriguez, M. 2013: El Cultivo del Pistacho. Ediciones Mundi-Prensa. Madrid, ES.

Ferguson, L., Polito, V., Kallsen, C., The pistachio tree; botany and physiology and factors that affect yield. http://fruitsandnuts.ucdavis.edu/files/73683.pdf, pp. 31 to 39.

IPGRI, 1997: Descriptors for Pistachio (*Pistacia vera* L.). International Plant Genetic Resources Institute, Rome, IT.

Kafkas, S., Kafkas, E., Perl-Treves R., 2002: Morphological diversity and a germplasm survey of three wild Pistacia species in Turkey. Genetic Resources and Crop Evolution 49, pp. 261 to 270.

Padulosi, S., Hadj-Hassan, A. editors, 2001: Project on Underutilized Mediterranean Species. Pistacia: towards a comprehensive documentation of distribution and use of its genetic diversity in Central & West Asia, North Africa and Mediterranean Europe. Report of the IPGRI Workshop, 14-17 December 1998, Irbid, JO.

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

1.1.1	Botanical name	*Pistacia vera* L.	[…]
1.1.2	Common name	Pistachio, Green-almond	
1.2	Interspecific hybrid (please specify):		[…]

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 variety)

(……..……..…) 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) *In vitro* propagation [ ]
(c) Budding or grafting [ ]
(d) Other (state method) [ ]

4.2.2 Other [ ]
(Please provide details)

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

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

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: sex**		
	female	Kerman (f), Larnaka (f)	1 [ ]
	male	Peters (m), Randy (m)	2 [ ]
5.2 (3)	**Plant: growth habit**		
	upright	Ouleimy (f)	1 [ ]
	spreading	Larnaka (f)	2 [ ]
	drooping	Insolia (f), Joley (f)	3 [ ]
5.3 (12)	**Terminal leaflet: shape of apex**		
	acute	Enk (m), Mateur (f)	1 [ ]
	obtuse		2 [ ]
	rounded	Golden Hills (f)	3 [ ]
	truncate	Insolia (f)	4 [ ]
	obcordate		5 [ ]
5.4 (24)	**Nut: shape in lateral view**		
	ovate	Kerman (f)	1 [ ]
	narrow elliptic	Napoletana (f)	2 [ ]
	broad elliptic	Sfax (f)	3 [ ]
5.5 (35)	**Time of beginning of vegetative bud burst**		
	very early	Aegina (f), Chico (m)	1 [ ]
	early	Larnaka (f)	2 [ ]
	medium	Ask (m), Bronte (f)	3 [ ]
	late	Joley (f)	4 [ ]
	very late	Kerman (f), Peters (m)	5 [ ]

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

	Characteristics	Example Varieties	Note
5.6 (36)	**Time of beginning of flowering**		
	very early	Avidon (f), Mateur (f)	1 [ ]
	early	Larnaka (f)	2 [ ]
	medium	02-18 (m), M-38 (m), Sfax (f)	3 [ ]
	late	Kastel (f)	4 [ ]
	very late	Kerman (f), Peters (m)	5 [ ]
5.7 (37)	**Time of harvest maturity**		
	very early	Avidon (f)	1 [ ]
	early	Golden Hills (f)	2 [ ]
	medium	Napoletana (f)	3 [ ]
	late		4 [ ]
	very late	Kerman (f)	5 [ ]

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: growth habit*	*spreading*	*drooping*

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

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

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

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

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

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

7.3.2 In the case of frost or chilling hour requirements for the correct development of plant material of the candidate variety in the DUS trial field, please specify:

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

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

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

.....

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]