



TG/184/4 Rev.

ORIGINAL: English

DATE: 2011-10-20 + 2018-09-20

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

<p>ARTICHOKE, CARDOON</p> <p>UPOV Code: CYNAR_CAR</p> <p><i>Cynara cardunculus</i> L.</p>
--

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*Alternative Names:**

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Cynara cardunculus</i> L.	Globe artichoke, Artichoke, Cardoon	Artichaut, Cardon	Artischocke, Cardy, Gemüseartichoke- Cardy, Kardonenartischocke	Alcachofa, Cardo

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.]

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES	3
2. MATERIAL REQUIRED	3
3. METHOD OF EXAMINATION.....	3
3.1 Number of Growing Cycles	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination.....	3
3.4 Test Design	4
3.5 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.2 Uniformity.....	5
4.3 Stability	6
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL	6
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	7
6.1 Categories of Characteristics.....	7
6.2 States of Expression and Corresponding Notes.....	7
6.3 Types of Expression.....	8
6.4 Example Varieties	8
6.5 Legend.....	8
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	9
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	22
8.1 Key for grouping varieties into artichoke and cardoon	22
8.2 Explanations covering several characteristics	24
8.3 Explanations for individual characteristics	25
9. LITERATURE	34
10. TECHNICAL QUESTIONNAIRE.....	35

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Cynara cardunculus* L..

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 (seed propagated varieties) or plant (vegetatively propagated varieties).

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

- | | |
|---------------------------------------|-------------|
| a) seed propagated varieties: | 1,500 seeds |
| b) vegetatively propagated varieties: | 60 plants. |

In the case 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*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 40 plants, which should be divided between at least two replicates.

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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

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

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

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

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

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

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

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

4.2 Uniformity

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

(a) *Cross-pollinated varieties*

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

(b) *Hybrid varieties/Inbred lines*

4.2.3 For the assessment of uniformity of inbred lines and hybrids, a population standard of 5% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 4 off-types are allowed. In addition, for hybrids, the same population standard and acceptance probability should be applied to clearly recognizable inbred plants.

In the case of a sample size of 40 plants, 4 clearly recognizable inbred plants would be allowed.

(c) *Vegetatively propagated varieties*

4.2.4 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 40 plants, 2 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 or 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 characteristics are used for grouping of varieties into Artichoke or Cardoon:

- (a) Midrib: thickness at 35 cm from base (characteristic 14)
- (b) Main stem: diameter (characteristic 19)
- (c) Central flower head: length (characteristic 20)
- (d) Central flower head: diameter (characteristic 21)
- (e) Outer bract: thickness at base (characteristic 39)
- (f) Plant: number of lateral heads on main stem (characteristic 40)

The following have been agreed as useful grouping characteristics within Artichoke:

- (a) Leaf: intensity of lobing (characteristic 3)
- (b) Artichoke varieties only: Main stem: time of beginning of elongation (characteristic 17)
- (c) Artichoke varieties only: Central flower head: shape in longitudinal section (characteristic 22)
- (d) Artichoke varieties only: Outer bract: violet color on external side (characteristic 30)
- (e) Artichoke varieties only: Male sterility (characteristic 41)

The following have been agreed as useful grouping characteristics within Cardoon:

- (a) Leaf: intensity of lobing (characteristic 3)
- (b) Cardoon varieties only: Midrib: color (characteristic 9)
- (c) Midrib: length of spines (characteristic 16)

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”.

5.5 A key for grouping varieties into artichoke and cardoon is provided in Chapter 8.1.

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.

The types of example varieties are indicated as follows:

- (A) Artichoke
- (C) Cardoon

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

(+) 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	
1.1	VG/ MS	<u>Artichoke</u> varieties only: Plant: height	<u>Variétés d'artichaut</u> uniquement : Plante : hauteur	<u>Nur</u> Artischockensorten: Pflanze: Höhe	<u>Sólo variedades de</u> la alcachofa: Planta: altura		
QN	(a)	short	courte	niedrig	baja	3	
		medium	moyenne	mittel	media	Vert Globe (A)	5
		tall	haute	hoch	alta	Madrigal (A)	7
1.2	VG/ MS	<u>Cardoon varieties</u> only: Plant: height	<u>Variétés de cardon</u> uniquement : Plante : hauteur	<u>Nur Cardysorten:</u> Pflanze: Höhe	<u>Sólo variedades del</u> cardo: Planta: altura		
QN	(a)	short	courte	niedrig	baja		3
		medium	moyenne	mittel	media	Rouge d'Alger (C)	5
		tall	haute	hoch	alta	Verde de Peralta (C)	7
2.	VG	Leaf: attitude	Feuille : port	Blatt: Stellung	Hoja: porte		
QN	(a)	erect	dressé	aufrecht	erecto	Pètre (A), Vert de Provence (A), Vert de Vaulx en Velin (C)	1
		semi-erect	demi-dressé	halbaufrecht	semierecto	Camus de Bretagne (A), Olympus (A), Plein blanc amélioré (C)	3
		horizontal	horizontal	waagrecht	horizontal	Blanc hyérois (A), Symphony (A)	5
3.	VG (* (+)	Leaf: intensity of lobing	Feuille : intensité de la découpe du bord	Blatt: Intensität der Lappung	Hoja: intensidad del lobulado		
QN	(a)	weak	faible	gering	leve	Blanca de Tudela (A), Plein blanc amélioré Puvis (C), Violet de Provence (A)	3
		medium	moyenne	mittel	medio	Ateca (C), Loma (A), Plein blanc amélioré (C)	5
		strong	forte	stark	fuerte	Opal (A), Vert de Vaulx en Velin (C)	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
4.	VG	Lobe: shape of tip (excluding terminal lobe)	Lobe : forme de l'extrémité (lobe terminal exclu)	Lappen: Form der Spitze (ohne Endlappen)	Lóbulo: forma del extremo (excluido el lóbulo terminal)		
(+)							
PQ	(a)	narrow acute	aiguë, étroite	schmal spitz	agudo estrecho	Ateca (C), Matterhorn (A), Vert de Vaulx en Velin (C)	1
		broad acute	aiguë, large	breit spitz	agudo ancho	Plein blanc amélioré (C)	2
		rounded	arrondie	abgerundet	redondeado		3
5.	VG	Lobe: number of secondary lobes	Lobe : nombre de lobes secondaires	Lappen: Anzahl Sekundärlappen	Lóbulo: número de lóbulos secundarios		
(+)							
QN	(a)	absent or very few	nul ou très petit	fehlend oder sehr gering	ninguno o muy escaso	Plein blanc amélioré (C), Puvis (C), Violet de Provence (A)	1
		few	petit	gering	escaso	Camus de Bretagne (A), Matterhorn (A), Rouge d'Alger (C)	3
		medium	moyen	mittel	medio	Blanc hyérois (A), Popvert (A), Vert de Vaulx en Velin (C)	5
		many	grand	groß	elevado	Opal (A)	7
		very many	très grand	sehr groß	muy elevado		9
6.	VG	Leaf blade: blistering	Limbe : cloqure	Blattspreite: Blasigkeit	Limbo: abullonado		
QN	(a)	weak	faible	gering	leve	Blanc hyérois (A), Matterhorn (A), Plein blanc amélioré (C)	3
		medium	moyenne	mittel	medio	Calico (A), Rouge d'Alger (C)	5
		strong	forte	stark	fuerte	Chrysanthème (A), Harmony (A),	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
7.	VG	Leaf blade: color	Limbe : couleur	Blattspreite: Farbe	Limbo: color		
PQ	(a)	yellow green	vert-jaune	gelbgrün	verde amarillento	Bianco avorio a foglia frastagliata (C), Blanc hyérois (A)	1
		light green	vert clair	hellgrün	verde claro	Salambo (A)	2
		medium green	vert moyen	mittelgrün	verde medio	Plein blanc amélioré (C)	3
		dark green	vert foncé	dunkelgrün	verde oscuro	Madrigal (A)	4
		grey green	vert-gris	graugrün	verde grisáceo	Camus de Bretagne (A), Symphony (A), Vert de Vaulx en Velin (C)	5
8.	VG	<u>Artichoke varieties only:</u> Midrib: anthocyanin coloration at base	<u>Variétés d'artichaut uniquement :</u> Nervure médiane : pigmentation anthocianique au niveau de la base	<u>Nur Artischockensorten: Mittelrippe: Anthocyanfärbung der Basis</u>	<u>Sólo variedades de la alcachofa: Nervio central: pigmentación antociánica de la base</u>		
QN	(a)	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy leve	Blanca de Tudela	1
		weak	faible	gering	leve	Castel, Loma	3
		medium	moyenne	mittel	media	Adir, Opal, Pètre	5
		strong	forte	stark	fuerte	Violet de Provence	7
		very strong	très forte	sehr stark	muy fuerte		9
9.	VG	<u>Cardoon varieties only:</u> Midrib: color	<u>Variétés de cardon uniquement :</u> Nervure médiane : couleur	<u>Nur Cardysorten: Mittelrippe: Farbe</u>	<u>Sólo variedades del cardo: Nervio central: color</u>		
PQ	(a)	whitish	blanchâtre	weißlich	blanquecino	Plein blanc amélioré	1
		light green	vert clair	hellgrün	verde claro	Vert de Vaulx en Velin	2
		medium green	vert moyen	mittelgrün	verde medio		3
		dark green	vert foncé	dunkelgrün	verde oscuro		4
		light red	rouge clair	hellrot	rojo claro		5
		medium red	rouge moyen	mittelrot	rojo medio		6
		dark red	rouge foncé	dunkelrot	rojo oscuro	Rouge d'Alger	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.	VG/ MS	<u>Cardoon varieties</u> <u>only: Midrib:</u> length free of leaflets	<u>Variétés de cardon</u> <u>uniquement :</u> Nervure médiane : longueur sans folioles	<u>Nur Cardysorten:</u> <u>Mittelrippe: Länge</u> ohne Blattfiedern	<u>Sólo variedades del</u> <u>cardo: Nervio</u> central: longitud sin folíolos	
QN	(a)	short	courte	kurz	corto	3
		medium	moyenne	mittel	medio	5
		long	longue	lang	largo	7
11.	VG/ MS	<u>Cardoon varieties</u> <u>only: Midrib:</u> length from base to apex	<u>Variétés de cardon</u> <u>uniquement :</u> Nervure médiane : longueur de la base au sommet	<u>Nur Cardysorten:</u> <u>Mittelrippe: Länge</u> von der Basis zur Spitze	<u>Sólo variedades del</u> <u>cardo: Nervio</u> central: longitud desde la base hasta el ápice	
QN	(a)	short	courte	kurz	corto	3
		medium	moyenne	mittel	medio	Gigante di Romagna, Vert de Vaulx en Velin 5
		long	longue	lang	largo	Ateca 7
12.	VG/ MS	<u>Cardoon varieties</u> <u>only: Midrib:</u> width at 5 cm from base	<u>Variétés de cardon</u> <u>uniquement :</u> Nervure médiane : largeur à 5 cm de la base	<u>Nur Cardysorten:</u> <u>Mittelrippe: Breite</u> 5 cm oberhalb der Basis	<u>Sólo variedades del</u> <u>cardo: Nervio</u> central: anchura a 5 cm de la base	
QN	(a)	narrow	étroite	schmal	estrecho	3
		medium	moyenne	mittel	medio	Vert de Vaulx en Velin 5
		broad	large	breit	amplio	Plein blanc amélioré 7
13.	VG/ MS	<u>Cardoon varieties</u> <u>only: Midrib:</u> width at 35 cm from base	<u>Variétés de cardon</u> <u>uniquement :</u> Nervure médiane : largeur à 35 cm de la base	<u>Nur Cardysorten:</u> <u>Mittelrippe: Breite</u> 35 cm oberhalb der Basis	<u>Sólo variedades del</u> <u>cardo: Nervio</u> central: anchura a 35 cm de la base	
QN	(a)	narrow	étroite	schmal	estrecho	3
		medium	moyenne	mittel	medio	Vert de Vaulx en Velin 5
		broad	large	breit	ancho	Verde de Peralta 7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
14.	VG/ MS	Midrib: thickness at 35 cm from base	Nervure médiane : épaisseur à 35 cm de la base	Mittelrippe: Dicke 35 cm oberhalb der Basis	Nervio central: grosor a 35 cm de la base		
QN	(a)	very thin	très mince	sehr dünn	muy fino	Matterhorn (A), Violet de Camargue (A)	1
		thin	mince	dünn	fino	Opal (A), Vert de Vaulx en Velin (C)	3
		medium	moyenne	mittel	medio	Plein blanc amélioré Puvis (C)	5
		thick	épaisse	dick	grueso	Menuet (A), Plein blanc amélioré (C)	7
		very thick	très épaisse	sehr dick	muy grueso	Verde de Peralta (C)	9
15.	VG	<u>Cardoon varieties only: Midrib: profile of inner side at 5 cm from base</u>	<u>Variétés de cardon uniquement : Nervure médiane : profil de la face interne à 5 cm de la base</u>	<u>Nur Cardysorten: Mittelrippe: Profil der Innenseite 5 cm oberhalb der Basis</u>	<u>Sólo variedades del cardo: Nervio central: perfil de la cara interna a 5 cm de la base</u>		
QN	(a)	slightly concave	légèrement concave	leicht konkav	ligeramente cóncavo	Plein blanc amélioré	3
		moderately concave	modérément concave	mäßig konkav	moderadamente cóncavo	Rouge d'Alger	5
		strongly concave	fortement concave	stark konkav	muy cóncavo		7
16.	VG/ MG	Midrib: length of spines	Nervure médiane : longueur des épines	Mittelrippe: Länge der Stacheln	Nervio central: longitud de las espinas		
QN	(a)	absent or very short	nulle ou très courte	fehlend oder sehr kurz	ausentes o muy cortas	Bianco inerma (C), Madrigal (A)	1
		short	courte	kurz	cortas	Castel (A), Plein blanc amélioré (C)	3
		medium	moyenne	mittel	medias	Vert de Vaulx en Velin (C), Violet de Provence (C)	5
		long	longue	lang	largas	Epineux argenté de Plainpalais (C), Spinoso Sardo (A)	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. MG (*) (+)	<u>Artichoke varieties only:</u> Main stem: time of beginning of elongation	<u>Variétés d'artichaut uniquement :</u> Tige principale : époque de début d'élongation	<u>Nur Artischockensorten:</u> Haupttrieb: Zeitpunkt des Beginns der Streckung	<u>Sólo variedades de la alcachofa:</u> Tallo principal: época de inicio de la elongación		
QN	early	précoce	früh	precoz	Blanca de Tudela	3
	medium	moyenne	mittel	media	Opal	5
	late	tardive	spät	tardía	Madrigal	7
18.1 VG/ MS	<u>Artichoke varieties only:</u> Main stem: height from base to central flower head	<u>Variétés d'artichaut uniquement :</u> Tige principale : hauteur à partir de la base jusqu'au capitule central	<u>Nur Artischockensorten:</u> Haupttrieb: Höhe von Basis bis Hauptblütenkopf	<u>Sólo variedades de la alcachofa:</u> Tallo principal: altura de la base al capítulo central		
QN (b)	short	courte	niedrig	corto	Blanca de Tudela, Opal	3
	medium	moyenne	mittel	medio	Madrigal, Matterhorn	5
	tall	haute	hoch	alto	Olympus	7
18.2 VG/ MS	<u>Cardoon varieties only:</u> Main stem: height from base to central flower head	<u>Variétés de cardon uniquement :</u> Tige principale : hauteur à partir de la base jusqu'au capitule central	<u>Nur Cardysorten:</u> Haupttrieb: Höhe von Basis bis Hauptblütenkopf	<u>Sólo variedades del cardo:</u> Tallo principal: altura de la base al capítulo central		
QN (b)	short	courte	niedrig	corto		3
	medium	moyenne	mittel	medio	Plein blanc amélioré Puvis	5
	tall	haute	hoch	alto	Ateca	7
19. (*) (+)	VG/ MS Main stem: diameter	Tige principale : diamètre	Haupttrieb: Durchmesser	Tallo principal: diámetro		
QN (b)	small	petit	klein	pequeño		3
	medium	moyen	mittel	medio		5
	large	grand	groß	grande		7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20. (*)	VG/ MS	Central flower head: length	Capitule central : longueur	Hauptblütenkopf: Länge	Capítulo central: longitud	
QN	(b)	short	courte	kurz	corto	Ateca (C) 3
		medium	moyenne	mittel	medio	Imperial Star (A) 5
		long	longue	lang	largo	Adir (A) 7
21. (*)	VG/ MS	Central flower head: diameter	Capitule central : diamètre	Hauptblütenkopf: Durchmesser	Capítulo central: diámetro	
QN	(b)	small	petit	klein	pequeño	Ateca (C) 3
		medium	moyen	mittel	medio	5
		large	grand	groß	grande	Matterhorn (A) 7
22. (*)(+)	VG/ MS	<u>Artichoke varieties only:</u> Central flower head: shape in longitudinal section	<u>Variétés d'artichaut uniquement :</u> Capitule central : forme en section longitudinale	<u>Nur Artischockensorten:</u> Hauptblütenkopf: Form im Längsschnitt	<u>Sólo variedades de la alcachofa:</u> Capítulo central: forma en sección longitudinal	
PQ	(b)	triangular	triangulaire	dreieckig	triangular	Violet de Provence 1
		ovate	ovale	eiförmig	oval	Madrigal, Opal 2
		oblong	oblongue	rechteckig	oblongo	Chrysanthème 3
		circular	ronde	kreisförmig	circular	4
		oblate	aplatie	breitrund	achatado	5
23. (+)	VG	<u>Artichoke varieties only:</u> Central flower head: shape of apex	<u>Variétés d'artichaut uniquement :</u> Capitule central : forme du sommet	<u>Nur Artischockensorten:</u> Hauptblütenkopf: Form der Spitze	<u>Sólo variedades de la alcachofa:</u> Capítulo central: forma del ápice	
PQ	(b)	acute	pointue	spitz	agudo	Violet de Provence 1
		rounded	arrondie	abgerundet	redondeado	Camus de Bretagne, Concerto, Madrigal 2
		flat	aplatie	flach	plano	Chrysanthème 3
		depressed	déprimée	eingesenkt	deprimido	Pètre 4

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24.	VG	<u>Artichoke varieties only:</u> Central flower head: anthocyanin coloration of inner bracts	<u>Variétés d'artichaut uniquement :</u> Capitule central : pigmentation anthocianique des bractées internes	<u>Nur Artischockensorten:</u> Hauptblütenkopf: Anthocyanfärbung der inneren Deckblätter	<u>Sólo variedades de la alcachofa:</u> Capítulo central: pigmentación antocianica de las brácteas internas	
QN	(c)	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy leve	Popvert 1
		weak	faible	gering	leve	Catsel, Harmony, Madrigal, Opal, 3
		medium	moyenne	mittel	media	Blanc hyérois, Matterhorn 5
		strong	forte	stark	fuerte	Chrysanthème 7
		very strong	très forte	sehr stark	muy fuerte	Salambo 9
25.	VG	<u>Artichoke varieties only:</u> Central flower head: density of inner bracts	<u>Variétés d'artichaut uniquement :</u> Capitule central : densité des bractées internes	<u>Nur Artischockensorten:</u> Hauptblütenkopf: Dichte der inneren Deckblätter	<u>Sólo variedades de la alcachofa:</u> Capítulo central: densidad de las brácteas internas	
(+)						
QN	(c)	sparse	lâche	locker	laxas	3
		medium	moyenne	mittel	medias	Blanca de Tudela, Camus de Bretagne 5
		dense	dense	dicht	densas	Madrigal 7
26.	VG/MS	<u>Artichoke varieties only:</u> Receptacle: diameter	<u>Variétés d'artichaut uniquement :</u> Réceptacle : diamètre	<u>Nur Artischockensorten:</u> Blütenboden: Durchmesser	<u>Sólo variedades de la alcachofa:</u> Receptáculo: diámetro	
(+)						
QN	(c)	small	petit	klein	pequeño	Violet de Provence 3
		medium	moyen	mittel	mediano	Camus de Bretagne, Opal 5
		large	grand	groß	grande	Salambo 7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.	VG/MS (+)	<u>Artichoke varieties only:</u> Receptacle: thickness	<u>Variétés d'artichaut uniquement :</u> Réceptacle : épaisseur	<u>Nur Artischockensorten:</u> Blütenboden: Dicke	<u>Sólo variedades de la alcachofa:</u> Receptáculo: grosor	
QN	(c)	thin	dünn	fino	Blanc hyérois, Blanca de Tudela	3
		medium	mittel	medio	Daniel, Pètre	5
		thick	dick	grueso	Camus de Bretagne, Castel	7
28.	VG (+)	<u>Artichoke varieties only:</u> Receptacle: shape in longitudinal section	<u>Variétés d'artichaut uniquement :</u> Réceptacle : forme en section longitudinale	<u>Nur Artischockensorten:</u> Blütenboden: Form im Längsschnitt	<u>Sólo variedades de la alcachofa:</u> Receptáculo: forma en sección longitudinal	
QN	(c)	flat or slightly depressed	flach oder leicht eingesenkt	plano o levemente deprimido		1
		moderately depressed	mäßig eingesenkt	moderadamente deprimido	Camus de Bretagne, Salambo, Tempo	2
		strongly depressed	stark eingesenkt	muy deprimido	Blanc hyérois, Imperial Star	3
29.	MG/MS (+)	<u>Artichoke varieties only:</u> Central flower head: time of beginning of opening	<u>Variétés d'artichaut uniquement :</u> Capitule central : époque de début d'ouverture	<u>Nur Artischockensorten:</u> Hauptblütenkopf: Zeitpunkt des Beginns der Öffnung	<u>Sólo variedades de la alcachofa:</u> Capítulo central: época de comienzo de la apertura	
QN		early	früh	precoz	Chrysanthème, Imperial Star, Loma	3
		medium	mittel	mediana	Camus de Bretagne	5
		late	spät	tardía	Blanca de Tudela, Madrigal, Popvert	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	VG	<u>Artichoke</u>	<u>Variétés d'artichaut</u>	<u>Nur</u>	<u>Sólo variedades de</u>	
(*)		<u>varieties only:</u>	<u>uniquement :</u>	<u>Artischockensorten:</u>	<u>la alcachofa:</u>	
(+)		Outer bract: violet	Bractées externes :	Äußeres Deckblatt:	Bráctea externa:	
		color on external	couleur violette sur la	violette Farbe der	color violeta en la	
		side	face externe	Außenseite	cara externa	
PQ	(d)	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy leve	Harmony
		weak	faible	gering	leve	Violet de Provence
		medium	moyenne	mittel	medio	Chrysanthème
		strong	forte	stark	fuerte	Concerto, Salambo
		very strong	très forte	sehr stark	muy fuerte	Velours
31.	VG	<u>Artichoke</u>	<u>Variétés d'artichaut</u>	<u>Nur</u>	<u>Sólo variedades de</u>	
(*)		<u>varieties only:</u>	<u>uniquement :</u>	<u>Artischockensorten:</u>	<u>la alcachofa:</u>	
(+)		Outer bract:	Bractées externes :	Äußeres Deckblatt:	Bráctea externa:	
		coloration of apex	couleur du sommet	Farbe der Spitze	color del ápice en	
		on external side	sur la face externe	der Außenseite	la cara externa	
QL	(d)	green	vert	grün	verde	Calico
		bronze	bronze	bronzefarben	bronce	Blanc hyérois, Sakiz
		grey	gris	grau	gris	Camus de Bretagne
32.	VG	<u>Artichoke</u>	<u>Variétés d'artichaut</u>	<u>Nur</u>	<u>Sólo variedades de</u>	
(*)		<u>varieties only:</u>	<u>uniquement :</u>	<u>Artischockensorten:</u>	<u>la alcachofa:</u>	
(+)		Outer bract: shape	Bractées externes :	Äußeres Deckblatt:	Bráctea externa:	
		of apex	forme du sommet	Form der Spitze	forma del ápice	
PQ	(d)	acute	pointue	spitz	agudo	Harmony, Spinoso Sardo
		flat	aplatie	flach	plano	Concerto, Talpiot
		emarginate	émargée	eingekerbt	emarginado	Chrysanthème, Imperial Star, Madrigal, Matterhorn

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33.	VG	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(+)		Outer bract: depth of emargination	Bractées externes : profondeur de l'échancrure	Äußeres Deckblatt: Tiefe der Randeinschnitte	Bráctea externa: profundidad de la emarginación	
QN	(d)	shallow	peu profonde	flach	poco profunda	Castel, Pyrenees, Violet de Provence 1
		medium	moyenne	mittel	media	Blanc hyérois, Monquelina 3
		deep	profonde	tief	profunda	Chrysanthème, Imperial Star 5
34.	VG	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(+)		Outer bract: reflexing of tip	Bractées externes : courbure de la pointe	Äußeres Deckblatt: Biegung der Spitze	Bráctea externa: curvatura del extremo	
QN	(d)	inwards	vers l'intérieur	nach innen gebogen	hacia dentro	Chrysanthème 1
		straight	droite	gerade	derecho	Castel, Violet de Provence 2
		outwards	vers l'extérieur	nach außen gebogen	hacia fuera	Olympus 3
35.	VG	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(*)		Outer bract: length of spine	Bractées externes : longueur de l'épine	Blütenstiel: Länge der Stacheln	Bráctea externa: longitud de la espina	
QN	(d)	absent or very short	nulle ou très courte	fehlend oder sehr kurz	ausente o muy corta	Matterhorn, Opal 1
		short	courte	kurz	corta	Chrysanthème, Pyrenees 3
		medium	moyenne	mittel	media	Violet de Provence 5
		long	longue	lang	larga	Spinoso Sardo 7
		very long	très longue	sehr lang	muy larga	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
36.	VG	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(+)		Outer bract: mucron	Bractées externes : mucron	Äußeres Deckblatt: aufgesetzte Spitze	Bráctea externa: mucrón	
QL	(d)	absent	absent	fehlend	ausente	Chrysanthème, Pyrenees 1
		present	présent	vorhanden	presente	Camus de Bretagne 9
37.	VG	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(*)		Outer bract: shape	Bractées externes : forme	Äußeres Deckblatt: Form	Bráctea externa: forma	
QN	(d)	broader than long	plus larges que longues	breiter als lang	más ancha que larga	Calico, Cric, Pètre 1
		as broad as long	aussi larges que longues	so breit wie lang	tan ancha como larga	Camus de Bretagne, Pètre 2
		longer than broad	plus longues que larges	länger als breit	más larga que ancha	Harmony, Vert de Provence 3
38.	VG/MS	<u>Artichoke varieties only:</u>	<u>Variétés d'artichaut uniquement :</u>	<u>Nur Artischockensorten:</u>	<u>Sólo variedades de la alcachofa:</u>	
(+)		Outer bract: length of base	Bractées externes : longueur de la base	Äußeres Deckblatt: Länge der Basis	Bráctea externa: longitud de la base	
QN	(d)	short	courte	kurz	corta	3
		medium	moyenne	mittel	media	5
		long	longue	lang	larga	7
39.	VG/MG	Outer bract: thickness at base	Bractées externes : épaisseur au niveau de la base	Äußeres Deckblatt: Dicke an der Basis	Bráctea externa: grosor en la base	
(*)						
(+)						
QN	(d)	thin	fine	dünn	fina	1
		medium	moyenne	mittel	media	Blanc hyérois, Imperial Star, Popvert 2
		thick	épaisse	dick	gruesa	Pètre 3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. (*)	VG/MS	Plant: number of lateral heads on main stem	Plante : nombre de têtes latérales sur la tige principale	Pflanze: Anzahl seitlicher Blütenköpfe am Haupttrieb	Planta: número de capítulos laterales en el tallo principal	
QN	very few	très petit	sehr gering	muy escaso		1
	few	petit	gering	escaso	Blanc hyérois	3
	medium	moyen	mittel	medio	Salambo	5
	many	grand	groß	elevado	Chrysanthème	7
	very many	très grand	sehr groß	muy elevado	Cynamed	9
41. (*)(+)	VG	Artichoke varieties only: Male sterility	Variétés d'artichaut uniquement : Stérilité mâle	Nur Artischockensorten: Männliche Sterilität	Sólo variedades de la alcachofa: Androesterilidad	
QL	absent	absente	fehlend	ausente	Blanca de Tudela	1
	present	présente	vorhanden	presente		9

8. Explanations on the Table of Characteristics

8.1 *Key for grouping varieties into artichoke and cardoon*

- to classify varieties as Artichoke if at least one characteristic is in the Artichoke zone and no characteristics are in the Cardoon zone (in the grey zone for all other characteristics)

- to classify as Cardoon if at least one characteristic is in the Cardoon zone and no characteristics in the Artichoke zone (in the grey zone for all other characteristics)

- in all other cases the variety to be grown in both Artichoke and Cardoon trials.

The following characteristics are used for grouping of varieties into Artichoke or Cardoon:

Characteristic 14: Midrib: thickness at 35 cm from base

1	
2	Artichoke
3	
4	
5	
6	
7	Cardoon
8	
9	

Characteristic 18: Main stem: height from base to central flower head

1	
2	
3	Artichoke
4	
5	
6	
7	
8	Cardoon
9	

Characteristic 19: Main stem: diameter

1	
2	Cardoon
3	
4	
5	
6	
7	
8	Artichoke
9	

Characteristic 20: Central flower head: length

1	
2	Cardoon
3	
4	
5	
6	
7	
8	Artichoke
9	

Characteristic 21: Central flower head: diameter

1	
2	Cardoon
3	
4	
5	
6	
7	
8	Artichoke
9	

Characteristic 39: Outer bract: thickness at base

1	Cardoon
2	
3	
4	
5	
6	
7	Artichoke
8	
9	

Characteristic 40: Plant: number of lateral heads on main stem

1	
2	
3	Artichoke
4	
5	
6	
7	
8	
9	Cardoon

8.2 *Explanations covering several characteristics*

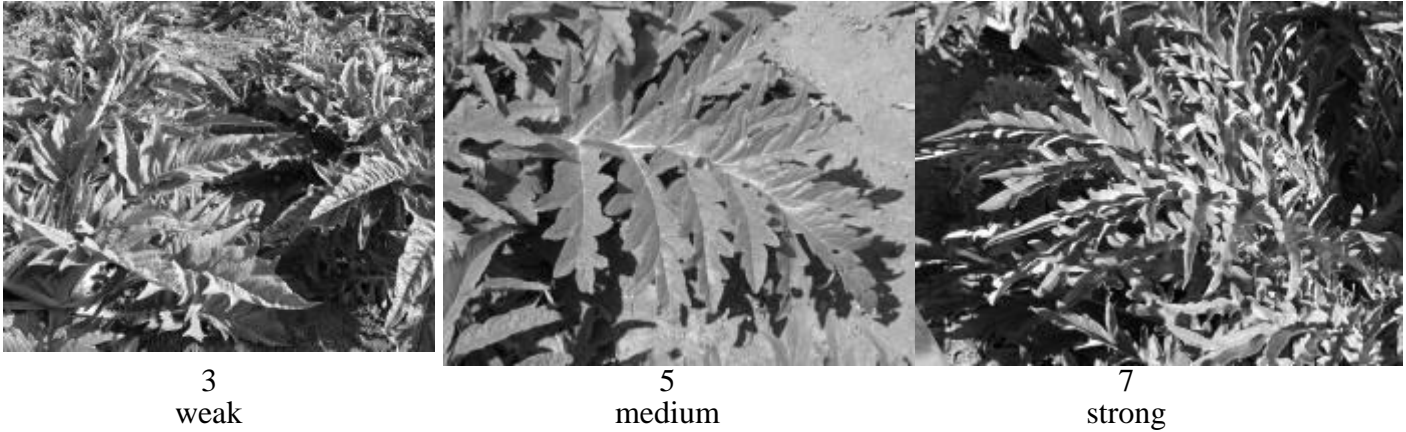
Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

- (a) Characteristics on plant, foliage (leaf, leaf blade and midrib = the central vein of the leaf, running down the centre of the blade) should be observed at fully vegetative development, just after the first flower head appears, but before the main flowering stem starts to elongate. Observations should be made at 10-12 leaves-stage on the 3rd-4th whorl of leaves from the base of the plant.
- (b) Characteristics on the main flowering stem and central flower head should be observed at the harvest stage of the central flower head (largest size of central flower head just before reflexing of lower part of bracts).
- (c) These characteristics should be observed on harvested central flower heads, cut in longitudinal section.
- (d) Characteristics on the outer bract should be observed on the 5th whorl of bracts from the base of the central flower head (close to the middle third of the flower head).

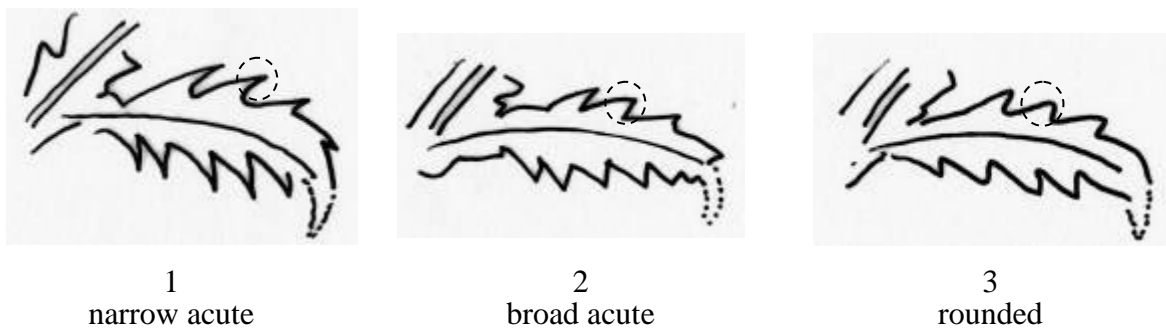
8.3 Explanations for individual characteristics

Ad. 3: Leaf: intensity of lobing

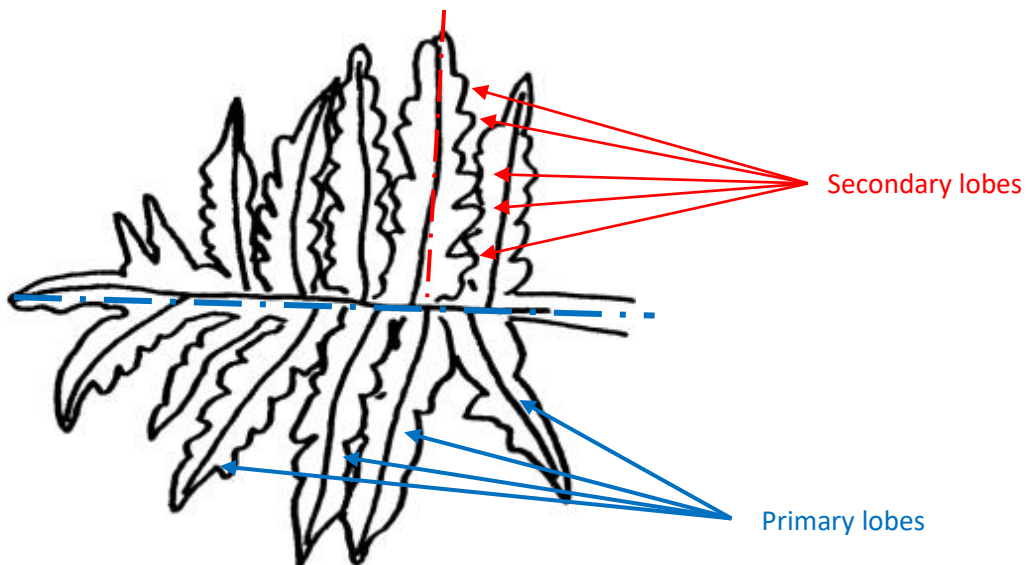
It includes the number of the primary lobes and the secondary lobes of the leaf.



Ad. 4: Lobe: shape of tip (excluding terminal lobe)

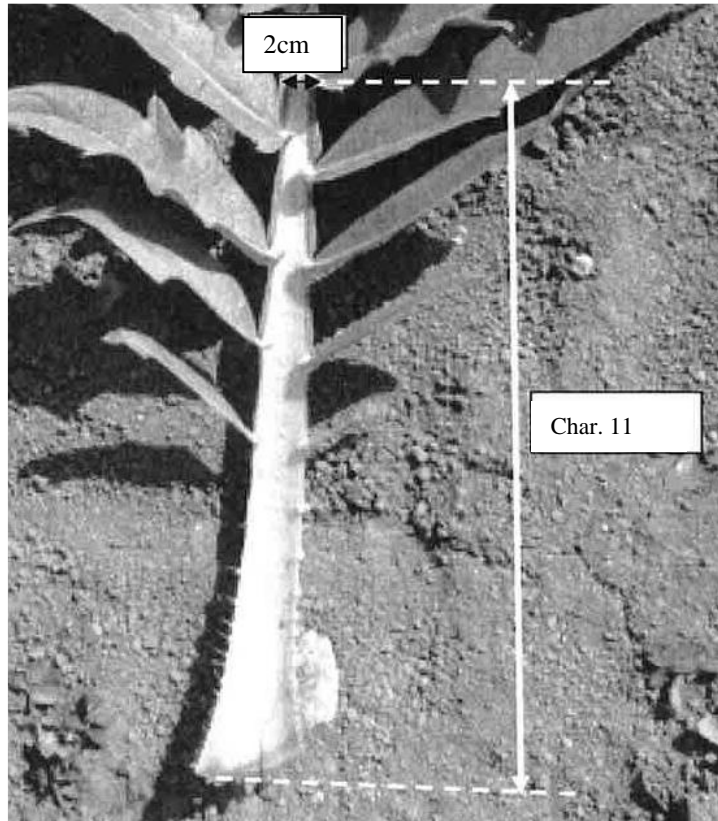


Ad. 5: Lobe: number of secondary lobes

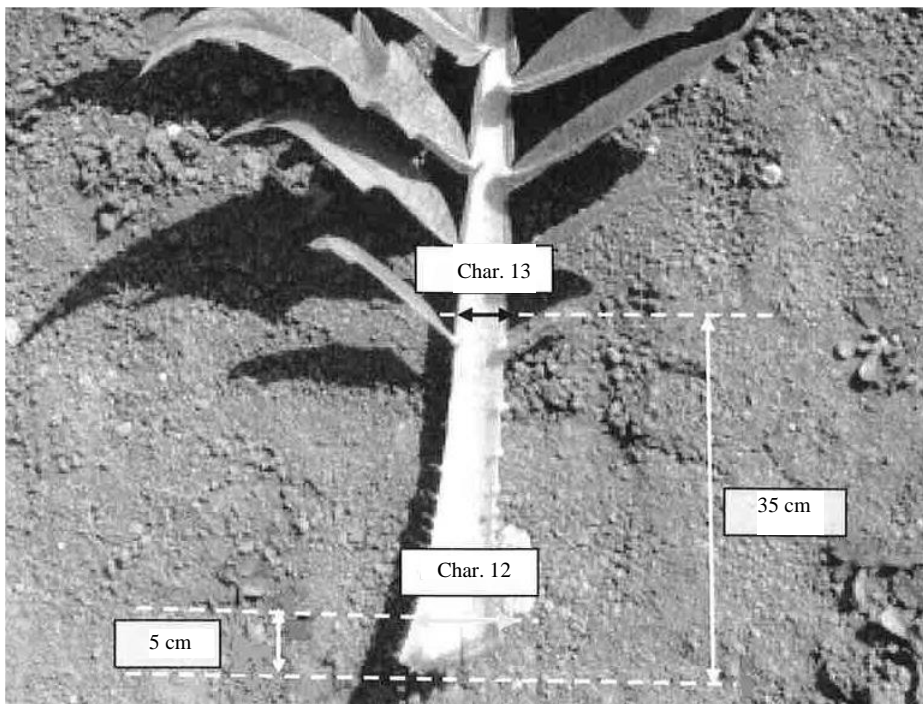


Ad. 11: Cardoon varieties only: Midrib: length from base to apex







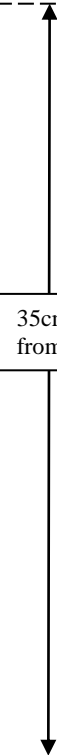
The length of the midrib is estimated by the distance between the base of the leaf to the point at 2 cm width on the rib.




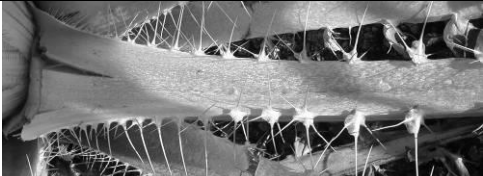
Ad. 12: Cardoon varieties only: Midrib: width at 5 cm from base
Ad. 13: Cardoon varieties only: Midrib: width at 35 cm from base



Ad. 14: Midrib: thickness at 35 cm from base

				
				
				 35cm from base
1	3	5	7	9
very thin	thin	medium	thick	very thick

Ad. 16: Midrib: length of spines

short	3	
medium	5	
long	7	

Ad. 17: Artichoke varieties only: Main stem: time of beginning of elongation

The time of beginning of elongation is when the flower stem emerges from the rosette of leaves.

The functioning of the cauline apex dominates the whole life of the plant. After forming a rosette of leaves, its transformation leads to the development of a complex form of inflorescence: a cyme of flower heads.

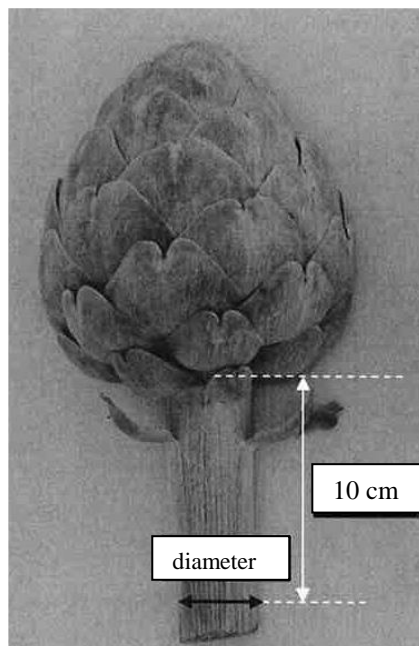
According to Foury (1967), there are six phenological stages during floral organogenesis. The two first stages clearly define the development of the flowering stem.

Stage A: Completely enveloped by the leaves, the main stem is still very short. The head is palpable at the bottom of the rosette.

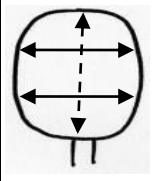
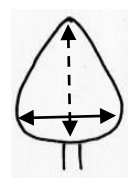
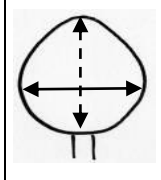
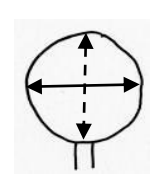
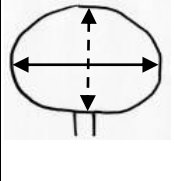
Stage B: The growth of the main stem and the deployment of the leaves show the flower head in the center of the rosette of leaves.



Ad. 19: Main stem: diameter

The main stem diameter can be measured with a caliper at 10 cm below the central flower head, at the stage of its full physiological development (harvest stage).



Ad. 22: Artichoke varieties only: Central flower head: shape in longitudinal section

		Position of the broadest part		
		below middle		at middle
		clearly	slightly	
Ratio length / width	elongated			 3 oblong
		 1 triangular	 2 ovate	 4 circular
	compressed			 5 oblate

 Maximum diameter = d
 Maximum height = h

Ad. 23: Artichoke varieties only: Central flower head: shape of apex



1
acute



2
rounded

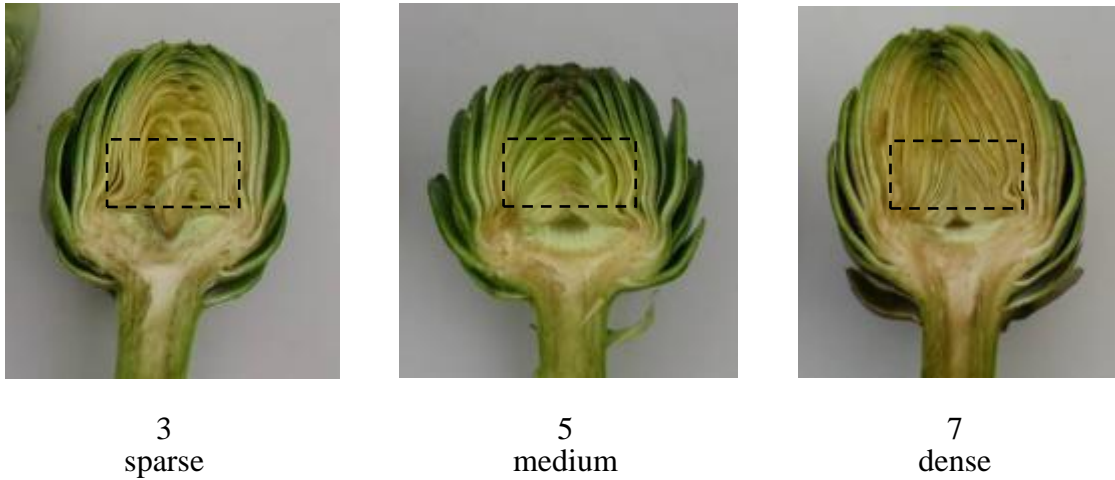


3
flat

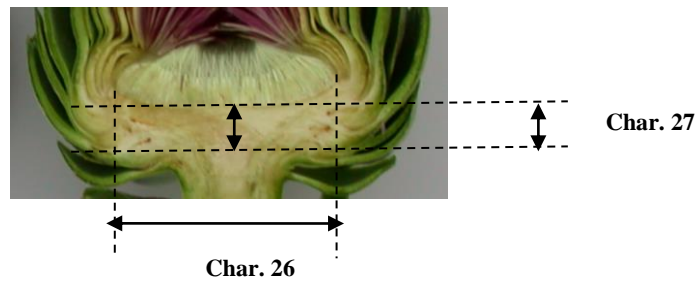


4
depressed

Ad. 25: Artichoke varieties only: Central flower head: density of inner bracts



Ad. 26: Artichoke varieties only: Receptacle: diameter
Ad. 27: Artichoke varieties only: Receptacle: thickness



Ad. 28: Artichoke varieties only: Receptacle: shape in longitudinal section



Ad. 29: Artichoke varieties only: Central flower head: time of beginning of opening

The time of beginning of opening of the central flower head is when the central flower head has opened on 50% of plants.

Ad. 30: Artichoke varieties only: Outer bract: violet color on external side



1
absent or
very weak

2
weak

3
medium

4
strong

5
very strong

Ad. 31: Artichoke varieties only: Outer bract: color of apex on external side



1
green

2
bronze

3
grey

Ad. 32: Artichoke varieties only: Outer bract: shape of apex



1
acute

2
flat

3
emarginate

Ad. 33: Artichoke varieties only: Outer bract: depth of emargination



1
shallow

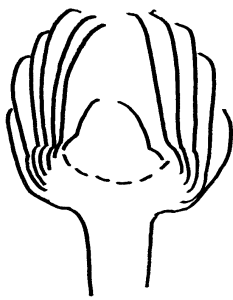


3
medium

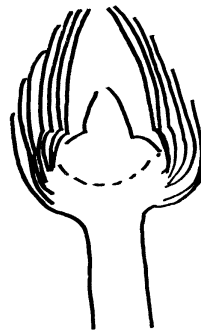


5
deep

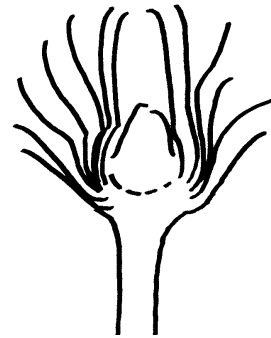
Ad. 34: Artichoke varieties only: Outer bract: reflexing of tip



1
inwards

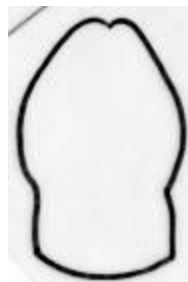


2
straight

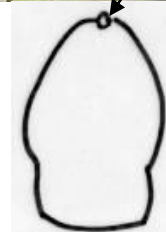


3
outwards

Ad. 36: Artichoke varieties only: Outer bract: mucron

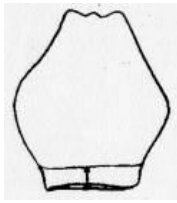


1
absent

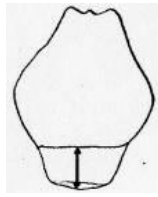


9
present

Ad. 38: Artichoke varieties only: Outer bract: length of base



3
short



5
medium



7
long

Ad. 39: Outer bract: thickness of base



1
thin



2
medium



3
thick

Ad. 41: Artichoke varieties only: Male sterility



1
absent



9
present

Check presence of pollen on stamen:

- (a) if pollen on stamen is present then male sterility is absent;
- (b) if pollen on stamen is absent then male sterility is present.

9. Literature

Baznizky, J. et Zohary, D. 1994 : Breeding of seed-planted artichoke. Plant Breeding Reviews 12: 253-267

Bravi, R., Spataro, G., Crino, P., Saccardo, F. 2008: L'istituzione del Registro Varietale del carciofo. Dal Seme n°2: 24-29

Doré, C., Varoquaux, F. co-ordinators 2006 : Histoire et amélioration de cinquante plantes cultivées, chap. Artichaut : 71-83

Foury, C. 1967 : Étude de la biologie florale de l'artichaut (*Cynara scolymus* L.); Application à la sélection. 1^{re} partie : données sur la biologie florale, Ann. Amélior. Plantes 17 (4): 357-373

Foury, C. 1969 : Étude de la biologie florale de l'artichaut (*Cynara scolymus* L.); Application à la sélection. 2^e partie : étude des descendances obtenues en fécondation contrôlée, Ann. Amélior. Plantes 19 (1): 23-52

Foury, C. et Aubert, S. 1977 : Observations préliminaires sur la présence et la répartition de pigments anthocyaniques dans un mutant d'artichaut (*Cynara scolymus* L.) à fleurs blanches, Ann. Amélior. Plantes 27 (5): 603-612

Foury, C. 1978 : Quelques aspects de l'histoire des variétés d'artichaut (*Cynara scolymus* L.), Journal d'agric. traditionnelle et de botanique appliquée, XXV (1) janvier-mars 1978

Foury, C. 1979 : Quelques aspects pratiques de la sélection généalogique de l'artichaut, 1-Présentation, création de lignées, Ann. Amélior. Plantes 29 (4): 383-418

Foury, C. 1989 : Ressources génétiques et diversification de l'artichaut (*Cynara scolymus* L.), Acta Horticulturae 242: 155-166

Pécaut, P. et Martin F. 1993 : Variation occurring after natural and *in vitro* multiplication of early Mediterranean cultivars of globe artichoke *Cynara scolymus* L. Agronomie 13: 909-919

Péron, J.Y. 2006: Références productions légumières, 2ème édition. chap. Artichaut :150-159

Péron, J.Y. 2006: Références productions légumières, 2ème édition. chap. Cardon :194-197

Zohary, D. et Basnizky J. 1975 : The cultivated artichoke – *Cynara scolymus* L. Its probable wild ancestors. Economic Botany 29: 233-235

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 (please indicate the relevant species)		
1.1 Botanical name	<input type="text" value="Cynara cardunculus L."/>	
1.2.1 Common name	<input type="text" value="Globe artichoke"/>	[]
1.2.2 Common name	<input type="text" value="Cardoon"/>	[]
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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

- (a) Vegetative propagation []

- (b) Seed propagation
 - Hybrid []
 - Parental line []
 - Open pollinated []

- (c) Other []
(please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>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).</p>		
Characteristics	Example Varieties	Note
<p>5.1 Leaf: intensity of lobing (3)</p>		
very weak		1 []
very weak to weak		2 []
weak	Blanca de Tudela (A), Violet de Provence (A), Plein blanc amélioré Puvis (C)	3 []
weak to medium		4 []
medium	Ateca (C), Loma (A), Plein blanc amélioré (C)	5 []
medium to strong		6 []
strong	Opal (A), Vert de Vaulx en Velin (C)	7 []
strong to very strong		8 []
very strong		9 []
<p>5.2 Midrib: thickness at 35 cm from base (14)</p>		
very thin	Matterhorn (A), Violet de Camargue (A)	1 []
very thin to thin		2 []
thin	Opal (A), Vert de Vaulx en Velin (C)	3 []
thin to medium		4 []
medium	Plein blanc amélioré Puvis (C)	5 []
medium to thick		6 []
thick	Menuet (A), Plein blanc amélioré (C)	7 []
thick to very thick		8 []
very thick	Verde de Peralta (C)	9 []

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

Characteristics	Example Varieties	Note
5.3 Midrib: length of spines (16)		
absent or very short	Bianco inerma (C), Madrigal (A)	1 []
very short to short		2 []
short	Castel (A), Plein blanc amélioré (C)	3 []
short to medium		4 []
medium	Vert de Vaulx en Velin (C), Violet de Provence (C)	5 []
medium to long		6 []
long	Epineux argenté de Plainpalais (C), Spinoso Sardo (A)	7 []
long to very long		8 []
very long		9 []
5.4 Main stem: diameter (19)		
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 []

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

Characteristics	Example Varieties	Note
5.5 Central flower head: length (20)		
very short		1 []
very short to short		2 []
short	Ateca (C)	3 []
short to medium		4 []
medium	Imperial Star (A)	5 []
medium to long		6 []
long	Adir (A)	7 []
long to very long		8 []
very long		9 []
5.6 Central flower head: diameter (21)		
very small		1 []
very small to small		2 []
small	Ateca (C)	3 []
small to medium		4 []
medium		5 []
medium to large		6 []
large	Matterhorn (A)	7 []
large to very large		8 []
very large		9 []
5.7 Outer bract: thickness at base (39)		
thin		1 []
medium	Blanc hyérois, Imperial Star, Popvert	2 []
thick	Pètre	3 []

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

Characteristics	Example Varieties	Note
5.8 Plant: number of lateral heads on main stem (40)		
very few		1 []
very few to few		2 []
few	Blanc hyérois	3 []
few to medium		4 []
medium	Salambo	5 []
medium to many		6 []
many	Chrysanthème	7 []
many to very many		8 []
very many	Cynamed	9 []
5.9 <u>Artichoke varieties only</u>: Main stem: time of beginning of elongation (17)		
very early		1 []
very early to early		2 []
early	Blanca de Tudela	3 []
early to medium		4 []
medium	Opal	5 []
medium to late		6 []
late	Madrigal	7 []
late to very late		8 []
very late		9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note
5.10 <u>Artichoke varieties only:</u> Main stem: height (18.1) from base to central flower head		
very short		
very short to short		
short	Blanca de Tudela, Opal	3 []
short to medium		
medium	Madrigal, Matterhorn	5 []
medium to tall		
tall	Olympus	7 []
tall to very tall		
5.11 <u>Artichoke varieties only:</u> Central flower head: (22) shape in longitudinal section		
triangular	Violet de Provence	1 []
ovate	Madrigal, Opal	2 []
oblong	Chrysanthème	3 []
circular		4 []
oblate		5 []
5.12 <u>Artichoke varieties only:</u> Outer bract: violet (30) color on external side		
absent to very weak	Harmony	1 []
weak	Violet de Provence	2 []
medium	Chrysanthème	3 []
strong	Concerto, Salambo	4 []
very strong	Velours	5 []
5.13 <u>Artichoke varieties only:</u> Male sterility (41)		
absent		1 []
present		9 []

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

Characteristics	Example Varieties	Note
5.14 <u>Cardoon varieties only:</u> Midrib: color (9)		
whitish	Plein blanc amélioré	1 []
light green	Vert de Vaulx en Velin	2 []
medium green		3 []
dark green		4 []
light red		5 []
medium red		6 []
dark red	Rouge d'Alger	7 []
5.15 <u>Cardoon varieties only:</u> Main stem: height from (18.2) base to central flower head		
very short		1 []
very short to short		2 []
short		3 []
short to medium		4 []
medium	Plein blanc amélioré Puvis	5 []
medium to tall		6 []
tall	Ateca	7 []
tall to very tall		8 []
very tall		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
<i>Example</i>	Leaf: intensity of lobing	weak	medium

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7.. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p> <p>A representative color image of the variety should accompany the Technical Questionnaire.</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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]