

UPOV

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
 GENEVA

DRAFT

CARDOON *

UPOV Code: CYNAR_CAR

Cynara cardunculus var. *cardunculus* L.

(see endnote a)

GUIDELINES**FOR THE CONDUCT OF TESTS****FOR DISTINCTNESS, UNIFORMITY AND STABILITY***prepared by experts from France**to be considered by the**Technical Working Party for Vegetables**at its forty-third session, to be held in Beijing, from April 20 to 24, 2009*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Cynara cardunculus</i> var. <i>cardunculus</i> L.	Cardoon	Cardon		

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.

Other associated UPOV documents: Test Guidelines for Globe Artichoke (TG/184/4)

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

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1. Subject of these Test Guidelines

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

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

50 g or 1400 seeds

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

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

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 *Number of Growing Cycles*

The minimum duration of tests should normally be two independent growing cycles.

3.2 *Testing Place*

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 *Conditions for Conducting the Examination*

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

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

MG: single measurement of a group of plants or parts of plants

MS: measurement of a number of individual plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

VS: visual assessment by observation of individual plants or parts of plants

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of **at least 40 plants**, which should be divided between two or more 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 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, 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.”

3.6 *Additional Tests*

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being

examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 *Uniformity*

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

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

4.3 *Stability*

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

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

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Leaf: length of spine (characteristic 3)
- (b) Leaf: intensity of lobing (characteristic 5)
- (c) Petiole: color (characteristic 16)
- ~~(d) Central flower head: shape in longitudinal section (characteristic 32)~~

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

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 *States of Expression and Corresponding Notes*

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

6.3 *Types of Expression*

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

6.4 *Example Varieties*

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

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

QN: Quantitative characteristic – see Chapter 6.3

PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS: See Chapter 3.3.2

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

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

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres¹

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. VG/ Plant: height (*) MG						
QN (a)	short					3
	medium					5
	tall				Plein blanc amélioré	7
2. VG Leaf: attitude (*)						
QN (a)	erect				Rouge d'Alger	1
	semi-erect				Plein blanc amélioré	2
	horizontal					3
3. VG Leaf: length of (*) spine (+)						
QN (a)	weak				Plein blanc amélioré	3
	medium					5
	strong				Epineux de Plainpalais	7
4. VG/ Leaf: length (*) MG						
QN (a)	short					3
	medium				Plein blanc amélioré	5
	long				Rouge d'Alger	7

¹ Characteristics shaded in green are not included in the Test Guidelines for Artichoke (TG/184/4). All the other characteristics are included in the Test Guidelines for Artichoke (TG/184/4) and the Test Guidelines for Cardoon (this document).

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*) (+)	VG	Leaf: intensity of lobing				
QN	(a)	weak			Plein blanc amélioré Puvis	3
		medium			Plein blanc amélioré	5
		strong			Vert de Vaulx en Velin	7
6. (*) (+)	VG/ MG	Leaf: number of lobes				
QN	(a)	weak			Plein blanc amélioré Puvis	3
		medium			Plein blanc amélioré	5
		strong			Vert de Vaulx en Velin	7
7. (+)	VG/ MG	Leaf: length of the longest lobe (excluding terminal lobe)				
QN	(a)	short				3
		medium				5
		long				7
8. (+)	VG/ MG	Leaf: width of the longest lobe (excluding terminal lobe)				
QN	(a)	narrow			Vert de Vaulx en Velin	3
		medium				5
		broad			Plein blanc amélioré Puvis	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
9.	VG	Lobe: shape of tip (excluding terminal lobe)					
NEW							
QN	(a)	acute				1	
		nearly right angle				2	
		obtuse				3	
10.	VG/ MG	Lobe: number of secondary lobes					
(+)							
QN	(a)	absent or very few			Plein blanc amélioré Puvis	1	
		few			Rouge d'Alger	3	
		medium			Vert de Vaulx en Velin	5	
		many				7	
		very many				9	
11.	VG	Secondary lobe: shape of tip (excluding terminal lobe)					
(+)							
QL	(a)	acuminate			Vert de Vaulx en Velin	1	
		acute			Rouge d'Alger	2	
		rounded			Plein blanc amélioré Puvis	3	
12.	VG	Leaf blade: color (upper side)					
(*)							
PQ	(a)	yellow green			Bianco avorio a foglia frastagliata	1	
		green				2	
		grey green			Vert de Vaulx en Velin	3	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13.	VG	Leaf blade: intensity of green color (upper side)		-	-	-
QN	(a)	light				3
		medium				5
		dark				7
14.	VG	Leaf blade: hairiness at upper face				
QN	(a)	absent or weak				3
		medium			Plein blanc amélioré	5
		strong			Plein blanc amélioré Puvis	7
15.	VG	Leaf blade: blistering				
QN	(a)	weak			Plein blanc amélioré	3
		medium			Rouge d'Alger	5
		strong				7
16.	VS	Petiole: color				
(*)						
(+)						
		whitish			Plein blanc amélioré	1
QL	(a)	green			Vert de Vaulx en Velin	2
		red			Rouge d'Alger	3
17.	VS	Petiole: intensity of the color (excluding white color)				
QN	(a)	light				3
		medium				5
		dark				7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18. (*) (+)	VG/ MG	Petiole: length				
QN	(a)	short			Plein blanc amélioré	3
		medium				5
		long			Vert de Vaulx en Velin	7
19. (+)	VG/ MG	Petiole: useful length				
		short				3
QN	(a)	medium			Gigante di Romagna, Vert de Vaulx en Velin	5
		long			Ateca	7
20. (*) (+)	VG/ MG	Petiole: width at 5cm from base				
QN	(a)	narrow				3
		medium			Vert de Vaulx en Velin	5
		broad			Plein blanc amélioré	7
21. (*) (+)	VG/ MG	Petiole: width at 35 cm from the base				
		narrow				3
QN	(a)	medium			Vert de Vaulx en Velin	5
		broad			Verde de Peralta	7
22. (*)	VG/ MG	Petiole: thickness at 35 cm from the base				
QN	(a)	thin				3
		medium			Vert de Vaulx en Velin	5
		thick				7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.	VG	Petiole: profile of inner side at 5 cm from base				
(+)						
QN	(a)	slightly concave			Plein blanc amélioré	3
		moderately concave			Rouge d'Alger	5
		strongly concave				7
24.	VG	Petiole: hollowing				
(+)						
QN	(a)	weak				3
		medium				5
		strong			Plein Blanc Inerme	7
25.	VG	Petiole: length of spine				
(*)						
(+)						
		weak			Plein blanc amélioré	3
QN	(a)	medium			Vert de Vaulx en Velin	5
		strong			Epineux de Plainpalais	7
26.	VG/ MG	Plant: maximum height at full flowering (Central and secondaries flower heads included)				
QN	(b)	short				3
		medium			Bianco avorio foglia frastagliata	5
		long			Ateca	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
27.	VG/ MG	Main stem: height to the base of first flower head				
QN	(b)	short				3
		medium			Blanc amélioré Puvis	5
		tall				7
28.	VG/ MG	Central flower head: time of appearance				
QN	(b)	early				3
		medium				5
		late				7

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

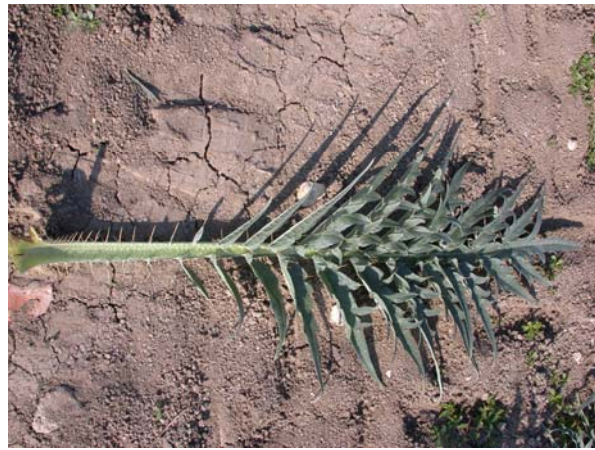
(a) Vegetative stage

- all the characteristics on plant have to be described at fully development, before appearance of the flowering stem
- all the characteristic on foliage (leaf, leaf blade and petiole) have to be observed on leaves taken at the same stage, in the middle third of the plant, at

(b) Flowering stage, the central flower head of the main stem at least has to be flowered.

8.2 *Explanations for individual characteristics*

Ad. 3: Leaf: length of spine



3
weak



7
strong

Ad. 5: Leaf: intensity of lobing

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



3
weak



7
strong

Ad. 6: Leaf: number of lobes

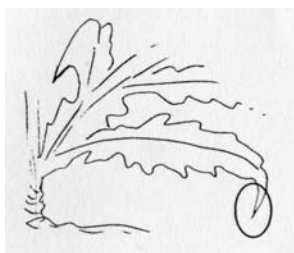
It includes number of the primary lobes ONLY.

Ad. 7: Leaf: length of the longest lobe (excluding terminal lobe)

Ad. 8: Leaf: width of the longest lobe (excluding terminal lobe)

Drawing to be provided

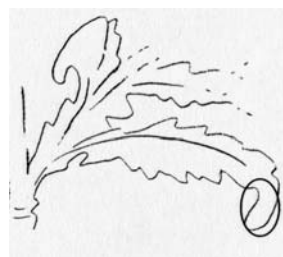
Ad. 9: Lobe: shape of tip (excluding terminal lobe)



1
acute

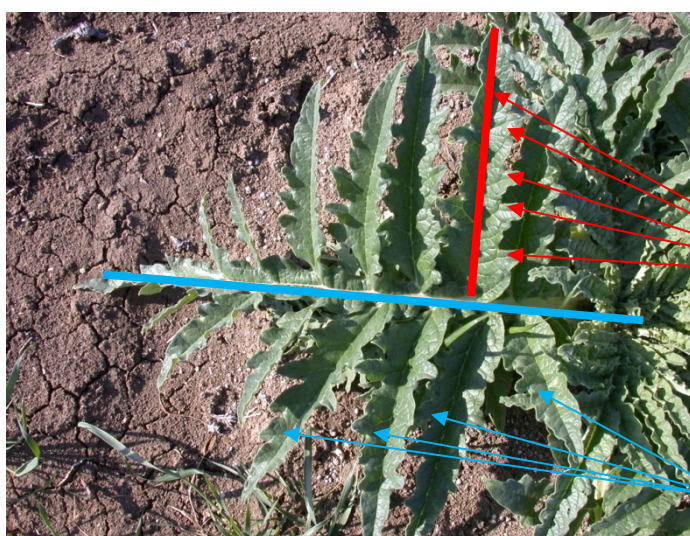


2
nearly right angle



3
obtuse

Ad. 10: Lobe: number of secondary lobes

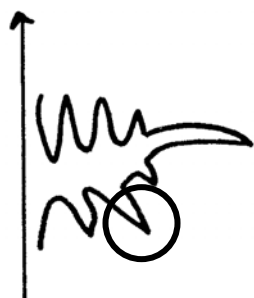


Secondary lobes

Primary lobes = lobes

<i>To be provided</i>				
1	3	5	7	9
absent or very few	few	medium	many	very many

Ad. 11: Secondary lobe: shape of tip (excluding terminal lobe)



1
acuminate



2
acute



3
rounded

Ad. 16: Petiole: color

- Color of the petiole in “natural” growing conditions, the petiole is not whitened in the dark.
- To observe in the first basal third of the petiole.



1
whitish



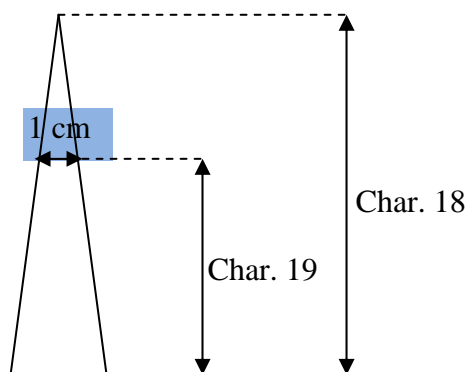
2
green



3
red

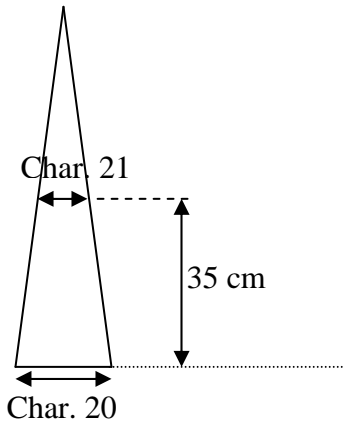
Ad. 18: Petiole: length

Ad. 19: Petiole: useful length

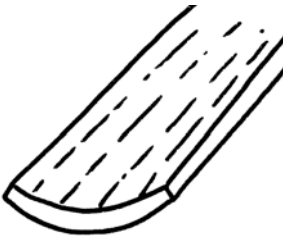


Ad. 20: Petiole: width at 5 cm from base

Ad. 21: Petiole: width at 35 cm from the base



Ad. 23: Petiole: profile of inner side in cross section at 5 cm from base



3

slightly concave



5

moderately concave



7

strongly concave

Remark: to observe at 5 cm from the base of petiole

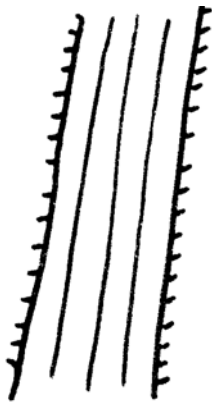
Ad.24: Petiole:hollowing

Explanation to be provided

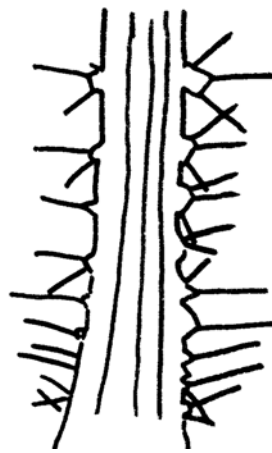
Tendency to become hollow?

Which stage? Old leaves?

Ad. 25: Petiole: length of spine



3
weak



7
strong

9. Literature

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

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)		
1.1.1 Botanical name	<input type="text" value="Cynara cardunculus var. cardunculus L."/>	
1.1.2 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:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

- 4.1.1 Crossing []
- (a) controlled cross []
(please state parent varieties)
 - (b) partially known cross []
(please state known parent variety(ies))
 - (c) unknown cross []
- 4.1.2 Mutation []
(please state parent variety)
- 4.1.3 Discovery and development []
(please state where and when discovered
and how developed)
- 4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

- (a) Vegetative propagation []
- (b) Seed propagation []
 - Hybrid []
 - Open pollinated []
- (c) 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:
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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 Leaf: attitude (2)		
erect	Rouge d'Alger	1 []
semi-erect	Plein blanc amélioré	2 []
horizontal		3 []
5.2 Leaf: length of spine (3)		
weak	Plein blanc amélioré	3 []
medium		5 []
strong	Epineux de Plainpalais	7 []
5.3 Leaf: intensity of lobing (5)		
weak	Plein blanc amélioré Puvis	3 []
medium		5 []
strong	Plein blanc amélioré, Vert de Vaulx en Velin	7 []
5.4 Petiole: color (16)		
whitish	Plein blanc amélioré	1 []
green	Vert de Vaulx en Velin	2 []
red	Rouge d'Alger	3 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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>	<i>Petiole: length</i>	<i>short</i>	<i>medium</i>

Comments:

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

8. Authorization for release

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

Yes [] No []

(b) Has such authorization been obtained?

Yes [] No []

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

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

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

^a Office note: the following is the GRIN classification for *Cynara* L:

Cynara algarbiensis Coss. ex Mariz
Cynara auranitica Post
Cynara baetica (Spreng.) Pau
Cynara baetica subsp. *baetica*
Cynara baetica subsp. *maroccana* Wiklund
***Cynara cardunculus* L.**
Cynara cardunculus* subsp. *cardunculus
***Cynara cardunculus* subsp. *flavescens* Wiklund**
Cynara cornigera Lindl.
Cynara cyrenaica Maire & Weiller
Cynara humilis L.
Cynara hystrix Ball (= *Cynara baetica* (Spreng.) Pau)
***Cynara scolymus* L. (= *Cynara cardunculus* L.)**
Cynara syriaca Boiss.

With regard to *Cynara cardunculus* L. it provides the following information

***Cynara cardunculus* L.**

Common names:

artichoke (Source: World Econ Pl)
artichoke thistle (Source: Noxweed Aust)
cardoon (Source: World Econ Pl)
globe artichoke (Source: World Econ Pl)
Scotch thistle (Source: Noxweed Aust)
cardon d'Espagne (Source: Dict Rehm) [French]
artichaut commun (Source: Dict Rehm as *C. scolymus*) [French]
Gemüseartischocke (Source: Dict Rehm) [German]
Kardone (Source: Dict Rehm) [German]
Artischocke (Source: Dict Rehm as *C. scolymus*) [German]
cardo (Source: Dict Rehm) [Portuguese, Spanish]
alcachofra (Source: Dict Rehm as *C. scolymus*) [Portuguese]
cardo de comer (Source: Dict Rehm) [Spanish]
alcachofa (Source: Dict Rehm as *C. scolymus*) [Spanish]
alcaucil (Source: Dict Rehm as *C. scolymus*) [Spanish]

Subordinate taxa:

Cynara cardunculus subsp. *cardunculus* (27 accessions)
Cynara cardunculus subsp. *flavescens* (no accessions)

Synonyms:

Cynara scolymus L.
(previously associated with 80 accessions)

UPOV has

- the present Test Guidelines for Cardoon (TG/CARD/---) under the botanical name *Cynara cardunculus* var. *cardunculus* L. – cardoon group
- The test Guideline for Artichoke (TG/184/4) under the botanical name *Cynara cardunculus* var. *scolymus* (L.° Benth. – *Scolymus* group