TG/CARD(proj.1)
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UPOV

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-first session, to be held in Nairobi, Kenya, from June 11 to 15, 2007

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Cynara cardunculus var. *cardunculus* 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/184/3)

* 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

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

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 60 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: intensity of spinosity (characteristic 4)
(b) Leaf: intensity of incisions (characteristic 7)
(c) Petiole: color (characteristic 18)
(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.

All the characteristics on plant, foliage (leaf, leaf blade and petiole) and petiole have to be described at fully development, before the appearance of the flowering stem.

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

(+) See Explanations on the Table of Characteristics in Chapter 8

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (*)	**VG/ MG**	**Plant: height**					
QN		short					3
		medium					5
		tall				Plein Blanc Amélioré	7
2. (*)	**VG**	**Plant: diameter**					
QN		small					3
						Bianco gigante inerme	4
		medium				Blanco lleno mejorado	5
						Verde de Peralta	6
		large					7
3. (*)	**VG**	**Leaf: attitude**					
QN		erect				Rouge d'Alger	1
		semi-erect				Plein Blanc Amélioré	2
		horizontal					3
4. (*) (+)	**VG**	**Leaf: intensity of spinosity**					
		weak				Plein Blanc Amélioré	3
QN		medium					5
		strong				Epineux de Plainpalais	7
5. (*)	**VG/ MG**	**Leaf: length**					
QN		short					3
		medium				Plein Blanc Amélioré	5
		long				Rouge d'Alger	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*)	**VG/ MG**	**Leaf: width**					
QN		narrow				Plein Blanc Amélioré Puvis	3
		medium				Rouge d'Alger	5
		broad					7
7. (*) (+)	**VG**	**Leaf: intensity of incisions**					
QN		weak				Plein Blanc Amélioré Puvis	3
		medium					5
		strong				Plein Blanc Amélioré, Vert de Vaulx en Velin	7
8. (*)	**VG/ MG**	**Leaf: number of lobes**					
QN		few				Plein Blanc Amélioré Puvis	3
		medium				Plein Blanc Amélioré	5
		many				Vert de vaulx en Velin	7
9.	**VG/ MG**	**Leaf: length of the longest lobe**					
QN		short					3
		medium					5
		long					7
10.	**VG/ MG**	**Leaf: width of the longest lobe**					
QN		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
11.	**MG**	**Lobe: ratio length / width**					
QN		small				Plein Blanc Amélioré	3
		medium				Vert de Vaulx en Velin	5
		large				Ateca	7
12. **(+)**	**VG**	**Secondary lobe: shape of tip (excluding terminal lobe)**					
QL		acuminate				Vert de Vaulx en Velin	1
		acute				Rouge d'Alger	2
		nearly right angle				Plein Blanc Amélioré Puvis	3
13.	**VG/ MG**	**Lobe: number of secondary lobes**					
QN		none 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
14. **(*)**	**VG**	**Leaf blade: color (upper side)**					
PQ		yellow green				Bianco avorio a foglia frastagliata	1
		green					2
		grey green				Vert de Vaulx en Velin	3
15.	**VG**	**Leaf blabe: intensity of green color (upper side)**					
QN		light					3
		medium					5
		dark					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	**VG**	**Leaf blade: hairiness at upper face**					
QN		absent or weak					3
		medium				Plein Blanc Amélioré	5
		strong				Plein Blanc Amélioré Puvis	7
17.	**VG**	**Leaf blade: blistering**					
QN		weak				Plein Blanc Amélioré	3
		medium				Rouge d'Alger	5
		strong					7
18. **(*)** **(+)**	**VS**	**Petiole: color**					
QL		whitish				Plein Blanc Amélioré	1
		green				Vert de Vaulx en Velin	2
		red				Rouge d'Alger	3
19.	**VS**	**Petiole: intensity of the color (excluding white color)**					
QN		light					3
		medium					5
		strong					7
20. **(*)** **(+)**	**VG/ MG**	**Petiole: length**					
QN		short				Plein Blanc Amélioré	3
		medium					5
		long				Vert de Vaulx en Velin	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21. (+)	**VG/ MG**	**Petiole: useful length**					
QN		short					3
		medium				Gigante di Romagna, Vert de Vaulx en Velin	5
		long				Ateca	7
22. (*) (+)	**VG/ MG**	**Petiole: width at the base**					
QN		narrow					3
		medium				Vert de Vaulx en Velin	5
		broad				Plein Blanc Amélioré	7
23. (*) (+)	**VG/ MG**	**Petiole: width at 35 cm from the base**					
QN		narrow					3
		medium				Vert de Vaulx en Velin	5
						Ateca	6
		broad				Verde de Peralta	7
24. (*)	**VG/ MG**	**Petiole: thickness at 35 cm from the base**					
QN		thin					3
						Giganta di Romagna	4
		medium				Vert de Vaulx en Velin	5
						Lleno de Espana	6
		thick					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25. **(+)**	**VG**	**Petiole: profile in cross section**					
QN		weak				Plein Blanc Amélioré	3
		medium				Rouge d'Alger	5
		strong					7
26.	**VG**	**Petiole: hollowing**					
QN		weak					3
						Ateca	4
		medium					5
						Vert de Vaulx en Velin	6
		strong				Plein Blanc Inerme	7
27. **(*)** **(+)**	**VG**	**Petiole: intensity of spinosity**					
QN		weak				Plein Blanc Amélioré	3
		medium				Vert de Vaulx en Velin	5
		strong				Epineux de Plainpalais	7
28.	**VG/ MG**	**Plant: maximum height at full flowering**					
QN		short					3
							4
		medium				Bianco avorio foglia frastagliata	5
						Inerme a foglia intera	6
		long				Ateca	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	**VG/ MG**	**Main stem: height to the base of first flower**					
QN		short					3
						Bianco avorio foglia frastagliata	4
		medium				Blanc amelioré Puvis	5
						Ateca	6
		tall					7
30.	**VG/ MG**	**Central flower head: length**					
QN		short					3
		medium					5
		long					7
31.	**VG/ MG**	**Central flower head: diameter**					
QN		small					3
		medium					5
		large					7
32. **(*)** **(+)**	**VG**	**Central flower head: shape in longitudinal section**					
QL		circular					1
		broad elliptic					2
		ovate					3
		triangular					4
		transverse broad elliptic					5

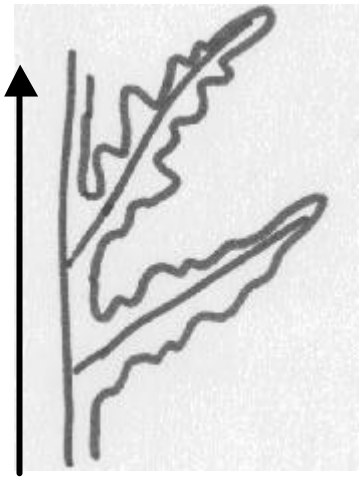
		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33.	**VG/ MG**	**Central flower head: time of appearerance**					
QN		early					**3**
		medium					**5**
		late					**7**

8. Explanations on the Table of Characteristics

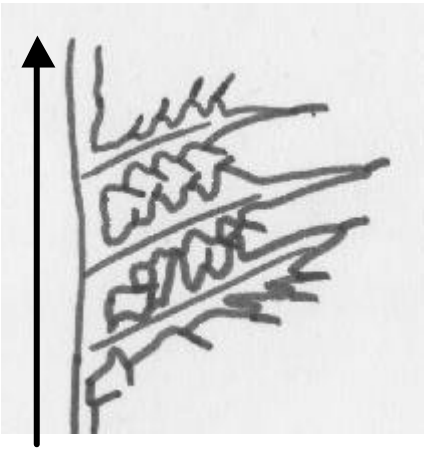
8.1 Explanations covering several characteristics

8.2 Explanations for individual characteristics

Ad. 4: Leaf: intensity of spinosity

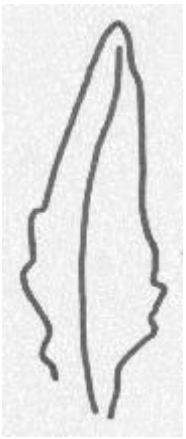


3
weak



7
strong

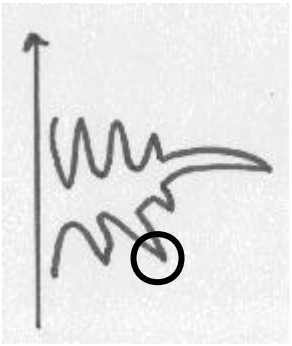
Ad. 7: Leaf: intensity of incisions



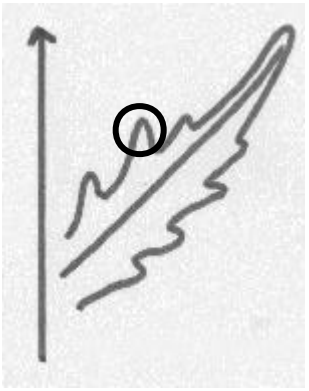
3
weak

7
strong

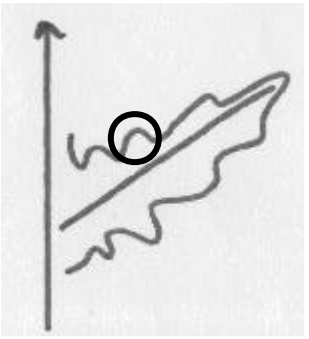
Ad. 12: Secondary lobe: shape of tip (excluding terminal lobe)



1
acuminate



2
acute

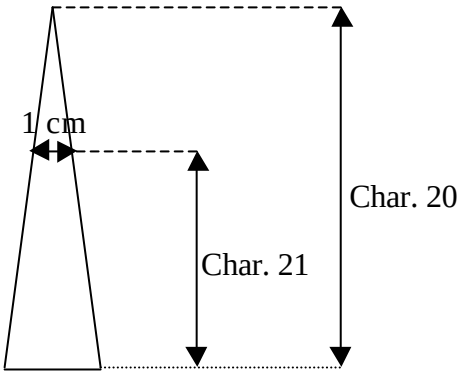


3
nearly right angle

Ad.18: Petiole: color

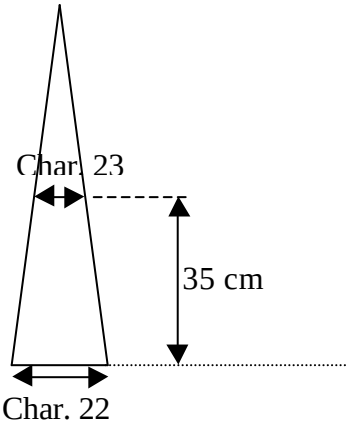
- Color of the petiole in "natural" growing conditions, the petiole is not whitened in the dark.
- To observe in the first basal third of the petiole.

Ad. 20: Petiole: length
Ad.21: Petiole: useful length

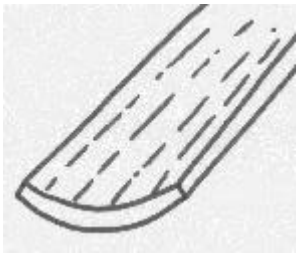


Ad. 22: Petiole: width at the base

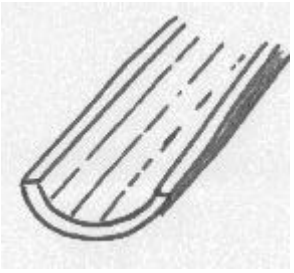
Ad. 23: Petiole: width at 35 cm from the base



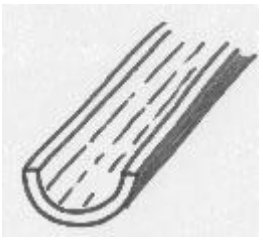
Ad. 25: Petiole: profile in cross section



3
weak



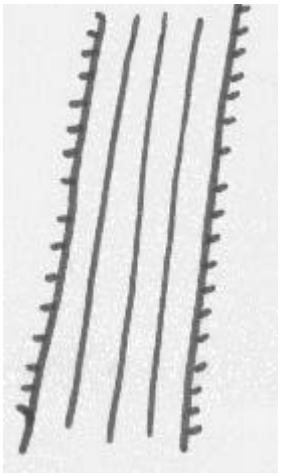
5
medium



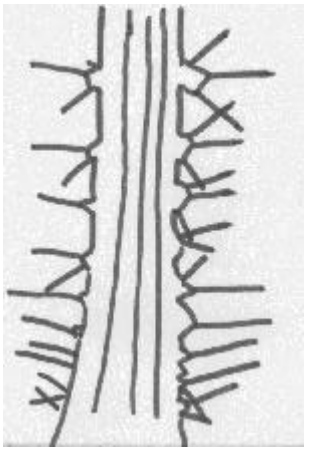
7
strong

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

Ad. 27: Petiole: intensity of spinosity

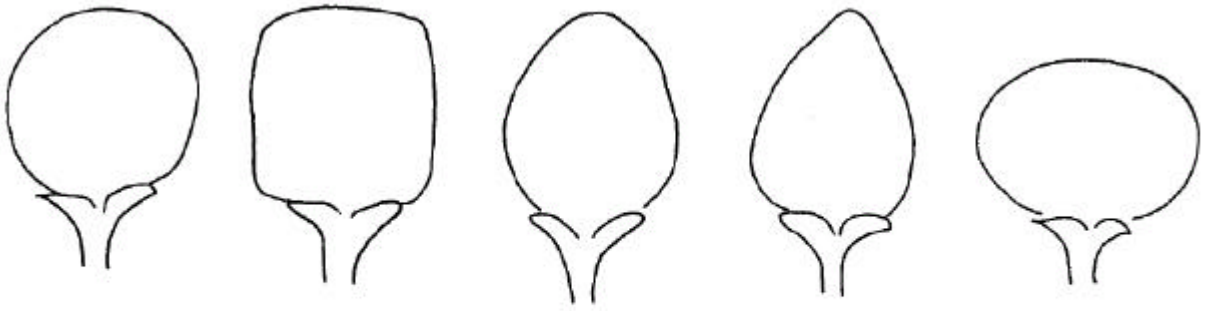


3
weak



7
strong

Ad. 32. Central flower head: shape in longitudinal section



1
circular

2
broad elliptic

3
ovate

4
triangular

5
transverse broad elliptic

Synonyms

- Blanc Amélioré = Plein Blanc Amélioré = Plein Blanc Inerme = Bianco a foglia frastagliata ??
- Puvis Amélioré = Plein Blanc Amélioré Puvis = Lleno d'España ??= Bianco gigante a foglia interra ??

9. Literature

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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	*Cynara cardunculus* var. *cardunculus* L.
1.1.2 Common name	Cardoon

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

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

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

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

(a) Cross-pollination
(i) population [ ]
(ii) synthetic variety [ ]

(b) Hybrid [ ]

(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:

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 (3)	**Leaf: attitude**		
	erect	Rouge d'Alger	1 [ ]
	semi-erect	Plein Blanc Amélioré	2 [ ]
	horizontal		3 [ ]
5.2 (4)	**Leaf: intensity of spinosity**		
	weak	Plein Blanc Amélioré	3 [ ]
	medium		5 [ ]
	strong	Epineux de Plainpalais	7 [ ]
5.3 (7)	**Leaf: intensity of incision**s		
	weak	Plein Blanc Amélioré Puvis	3 [ ]
	medium		5 [ ]
	strong	Plein Blanc Amélioré	7 [ ]
5.4 (18)	**Petiole: color**		
	whitish	Plein Blanc Amélioré	1 [ ]
	green	Vert de Vaulx en Velin	2 [ ]
	red	Rouge d'Alger	3 [ ]
5.5 (32)	**Central flower head: shape in longitudinal section**		
	circular		1 [ ]
	broad elliptic		2 [ ]
	ovate		3 [ ]
	triangular		4 [ ]
	transverse broad elliptic		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	*Petiole: length*	*short*	*long*

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)

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.

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]

[a] Office note: GRIN does not recognize *Cynara cardunculus* var. *cardunculus* L. : 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 already has Test Guidelines for Globe Artichoke (TG/184/3) under the botanical name *Cynara scolymus* L. (*Cynara cardunculus* var. *scolymus* L.). The GRIN database indicates that *Cynara scolymus* L. is a synonym of *Cynara cardunculus* L. Cardoon is also a part of Cynara cardunculus L. GRIN has suggested using:

Cynara cardunculus Cardoon Group - cardoon
Cynara cardunculus Scolymus Group - globe artichoke