

UPOV

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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF
PLANTS**
GENEVA

DRAFT**GLOBE ARTICHOKE**

UPOV Code: CYNAR_CAR

Cynara cardunculus var. *scolymus* (L.) Benth.(see ANNEX ^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>scolymus</i> (L) Benth.	Globe artichoke Artichoke	Artichaut		

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 Cardoon (TG/CARD/--)

* 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 Number of Plants / Parts of Plants to be Examined.....	4
3.6 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.2 Uniformity.....	5
4.3 Stability	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1 Categories of Characteristics.....	6
6.2 States of Expression and Corresponding Notes.....	6
6.3 Types of Expression.....	6
6.4 Example Varieties	6
6.5 Legend.....	6
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTERES/MERKMALSTABELLE/TABLA DE CARACTERES.....	8
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	18
8.1 Explanations covering several characteristics	18
8.2 Explanations for individual characteristics	18
9. LITERATURE	26
10. TECHNICAL QUESTIONNAIRE	27
ANNEX	33

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Cynara cardunculus* var. *scolymus* (L.) **Benth.**

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: 50 g or 1400 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*

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 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, hybrids and vegetatively propagated varieties in the General Introduction.~~

4.2.2 For the assessment of uniformity of seed-propagated varieties (inbred lines or 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 (the number includes plants resulting from the selfing of a parent line).

4.2.3 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 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 tested, either by growing a further generation, or by testing a new seed or plant 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 lobing (characteristic 5)
- b) Central flower head: time of appearance (characteristic 18)
- c) Central flower head: shape in longitudinal section (characteristic 24)
- d) Outer bract: color (external side) (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)-(e) 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					7
2. VG Leaf: attitude (*)						
QN (a)	erect				Capitan, Pètre, Vert de Provence	1
	semi-erect				Calico, Camus de Bretagne	3
	horizontal				Blanc Hyerois, Popvert	5
3. VG Leaf: length of spine (*)						
QN (a)	absent to very weak					1
	weak					3
	medium					5
	strong					7
	very strong				Spinoso sardo	9
4. VG/ Leaf: length MG						
QN (a)	short				Tudela, Violet de Provence	3
	medium				Blanc Hyerois, Chrysanthème, Popvert	5
	long				Camus de Bretagne, Caribou	7

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	VG/ Leaf: intensity of lobing					
	MG					
	(+)					
QN	(a) weak				Tudela, Violet de Provence	3
	medium					5
	strong					7
6.	VG/ Leaf: number of lobes					
	MG					
	(+)					
QN	(a) few				Violet de Provence, Tudela	3
	medium				Blanc Hyerois, Chrysanthème	5
	many				Salanquet	7
7.	VG/ Leaf: length of longest lobe					
	MG (excluding terminal lobe)					
QN	(a) short				Vertu	3
	medium				Orlando, Popvert, Sybaris	5
	long					7
8.	VG/ Leaf: width of longest lobe					
	MG (excluding terminal lobe)					
QN	(a) narrow				Vertu	3
	medium				Orlando, Popvert, Sybaris	5
	broad					7
9.	VG Lobe: shape of tip					
	(+)					
QL	(a) acute				Camus de Bretagne, Vertu	1
	nearly right angle				Calico, Caribou, Salambo	2
	obtuse					3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
10.	VG/ Lobe: number of secondary MG lobes					
	(+)					
QN	(a) absent or very few				Violet de Provence	1
	few				Camus de Bretagne	3
	medium				Blanc Hyerois, Popvert	5
	many				Orlando, Sybaris	7
	very many					9
11.	VG Secondary lobe: shape of tip (excluding terminal lobe)					
	(+)					
QL	(a) acuminate				Vert de Provence	1
	acute				Blanc Hyerois, Tudela	2
	rounded				Cric, Popvert	3
12.	VG Leaf blade: color (upper side)					
	(*)					
PQ	(a) yellow green				Blanc Hyerois	1
	green				Salambo	2
	grey green				Camus de Bretagne	3
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				Camus de Bretagne, Vertu	3
	medium				Carène, Popvert	5
	strong				Violet de Provence	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
15.	VG Leaf blade: blistering					
(*)						
QN	(a) weak				Blanc Hyerois, Popvert	3
	medium				Calico, Caribou	5
	strong				Chrysanthème	7
16.	VG Petiole: anthocyanin coloration at base					
QN	(a) absent or very weak				Capitan, Carène	1
	weak				Castel	3
	medium				Pètre	5
	strong				Violet de Provence	7
	very strong					9
17.	VG/ Plant: number of lateral					
(+)	MG shoots on main stem					
QN	few				Blanc Hyerois, Calico, Popvert	3
	medium				Salambo	5
	many				Chrysanthème, Vertu	7
18.	VG/ Central flower head: time of					
(*)	MG appearance					
QN	early				Chrysanthème, Tudela	3
	medium				Blanc Hyerois	5
	late				Camus de Bretagne	7
19.	VG/ Main stem: height to the					
(*)	MG base to the central flower					
(+)	head					
NEW						
QN	(b) short				Capitan	3
	medium				Castel, Salambo	5
	tall				Caribou	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20.	VG/ Main stem: distance MG between central flower head and youngest well developed leaf					
(+)						
QN	(b) short				Caribou, Violet de Provence	3
	medium				Blanc Hyerois, Tudela	5
	long				Castel	7
21.	VG/ Main stem: diameter (at MG about 10 cm below central flower head)					
QN	(b) small				Violet de Provence	3
	medium				Castel, Vertu	5
	large				Carène	7
22.	VG/ Central flower head: length MG					
	short				Pètre	3
QN	(b) medium					5
	long				Vert de Provence	7
23.	VG/ Central flower head: MG diameter					
QN	(b) small				Vert de Provence	3
	medium					5
	large				Camus de Bretagne, Salambo	7
24.	VG Central flower head: shape MG in longitudinal section					
(+)						
PQ	(b) circular				Castel, Green Globe	1
	broad elliptic				Chrysanthème, Vert de Provence	2
	ovate				Cric, Salambo	3
	triangular				Tudela, Violet de Provence	4
	transverse broad elliptic				Carène, Pètre	5

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25.	VG Central flower head: shape of tip					
(+)						
QL	(b) acute				Violet de Provence	1
	rounded				Camus de Bretagne	2
	flat				Chrysanthème	3
	depressed				Carène, Pètre	4
26.	VG Central flower head: anthocyanin coloration of inner bracts					
QN	(c) absent or very weak				Popvert	1
	weak				Catsel	3
	medium				Blanc Hyerois	5
	strong				Chrysanthème	7
	very strong				Salambo	9
27.	VG Central flower head: density of inner bracts					
(+)						
QN	(c) sparse				Camard, Calice	3
	medium				Camus de Bretagne	5
	dense				Cacique, Compact	7
28.	VG/ Receptacle: diameter					
MG						
(+)						
QN	(d) small				Violet de Provence	3
	medium				Camus de Bretagne	5
	large				Capitan, Salambo	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	VG/ Receptacle: thickness MG					
(+)						
QN	(c) thin				Blanc Hyerois, Tudela	3
	medium				Pètre	5
	thick				Camus de Bretagne, Castel	7
30.	VG Receptacle: shape in longitudinal section					
(+)						
QN	(c) flat				Carène	1
	slightly depressed				Camus de Bretagne, Salambo	2
	strongly depressed				Blanc Hyerois, Chrysanthème	3
31.	VG/ Central flower head: time of MG beginning of opening					
QN	early				Chrysanthème, Vert de Provence	3
	medium				Camus de Bretagne	5
	late				Popvert, Tudela	7
32.	VG Outer bract: color (external (* side)					
PQ	(d) green				Blanc Hyerois, Tudela, Vert de Provence	1
	green striped with violet				Violet de Provence	2
	violet striped with green				Chrysanthème	3
	mainly violet				Cric, Salambo	4
	entirely violet				Velours	5
33.	VG Outer bract: hue of (* secondary color (as of 32)					
QL	(d) absent				Calico	1
	bronze				Blanc Hyerois, Sakiz	2
	grey				Camus de Bretagne, Popvert	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
34. (*)	VG Outer bract: shape of apex					
QL	(d) acute				Spinoso Sardo	1
	flat				Talpiot	2
	emarginate				Chrysanthème	3
35. (*)	VG Outer bract: depth of emargination					
QN	(d) shallow				Castel, Violet de Provence	3
	medium				Blanc Hyerois	5
	deep				Chrysanthème	7
36. (+)	VG Outer bract: reflexing of tip					
PQ	(d) absent				Castel, Salambo	1
	towards center of flower head				Chrysanthème	2
	towards outside of the flower head				Calice	3
37. (*)	VG Outer bract: size of spine					
QN	(d) absent or very small				Calico	1
	small				Chrysanthème, Vertu	3
	medium				Violet de Provence	5
	large					7
	very large				Spinoso Sardo	9
38. (+)	VG Outer bract: mucron					
QL	(d) absent				Chrysanthème, Pètre	1
	present				Camus de Bretagne	9

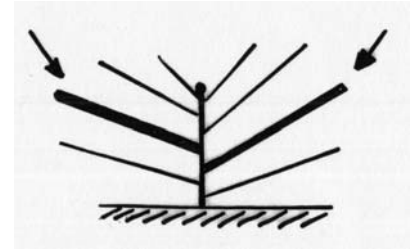
	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
39.	VG Outer bract: main shape					
(*)						
QN	(d) broader than long				Calico, Cric Pètre	1
	as broad as long				Camus de Bretagne, Pètre	2
	longer than broad				Vert de Provence, Vertu	3
40.	VG/ Outer bract: length of base					
(+)	MG					
QN	(d) short					3
	medium					5
	long					7
41.	VG/ Outer bract: width of base					
(+)	MG					
QN	(d) narrow				Orlando	3
	medium				Blanc Hyerois, Popvert, Vertu	5
	broad				Pètre	7
42.	VG/ Outer bract: thickness at					
(+)	MG base					
	thin					3
QN	(d) medium				Blanc Hyerois, Popvert, Vertu	5
	thick				Pètre	7
43.	VG/ First flower head on lateral					
	MG shoot: length					
QN	(e) short				Pètre, Popvert	3
	medium					5
	long				Vert de Provence	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
44.	VG/ MG					
	First flower head on lateral shoot: diameter					
QN	(e) small				Vert de Provence	3
	medium				Blanc Hyerois	5
	large				Salambo	7
45.	VG					
(+)	First flower head on lateral shoot: shape in longitudinal section					
PQ	(e) circular				Castel, Salambo	1
	broad elliptic				Cric, Blanc Hyerois	2
	ovate				Velours	3
	triangular				Violet de Provence	4
	transverse broad elliptic				Pètre, Popvert	5
46.	VG					
	First flower head on lateral shoot: degree of opening					
QN	(e) weak				Salambo	3
	medium				Blanc Hyerois	5
	strong				Chrysanthème	7
47.	VG/ MG					
(+)	Plant: maximum height at full flowering (central and secondary flower heads included)					
QN	short				Violet de Provence, Tudela	3
	medium				Blanc Hyerois, Camus de Bretagne, Vertu	5
	long				Caribou, Popvert, Salambo	7
48.	VG/ MG					
	Tendency to produce lateral shoots at base					
QN	weak				Blanc Hyerois, Castel, Vertu	3
	medium				Violet de Provence, Chrysanthème, Popvert	5
	strong				Cacique, Calico	7

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

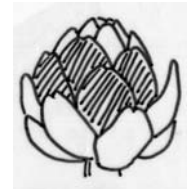
- (a) Characteristics on plant, foliage (leaf, leaf blade and petiole) which have to be described at fully vegetative development, just after the first flower head appears, but before the main flowering stem starts to stretch. Stage 10- 12 leaves = on the 3rd – 4th whorl of leaves from the base of the plant.



- (b) Characteristics on the main flowering stem and central flower head have to be described at the harvest stage of the central flower head (before opening).

- (c) All these characteristics have to be described on harvested central flower heads, cut in longitudinal section.

- (d) All these characteristics on the outer bracts have to be described on the 5th whorl of bracts from the base of the central flower head (close to the middle third of the flower head)



- (e) All these characteristics on the first lateral flower head have to be described at full development before opening.

8.2 *Explanations for individual characteristics*

Ad. 5: Leaf: intensity of lobing

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



3
weak



5
medium

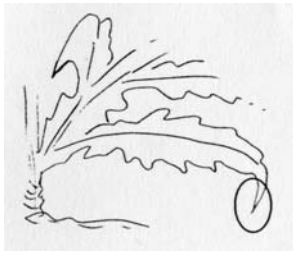


7
strong

Ad. 6: Leaf: number of lobes

It includes number of the primary lobes ONLY.

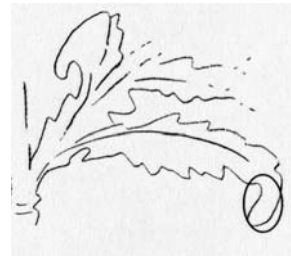
Ad. 9: Lobe: shape of tip (excluding terminal lobe)



1
acute

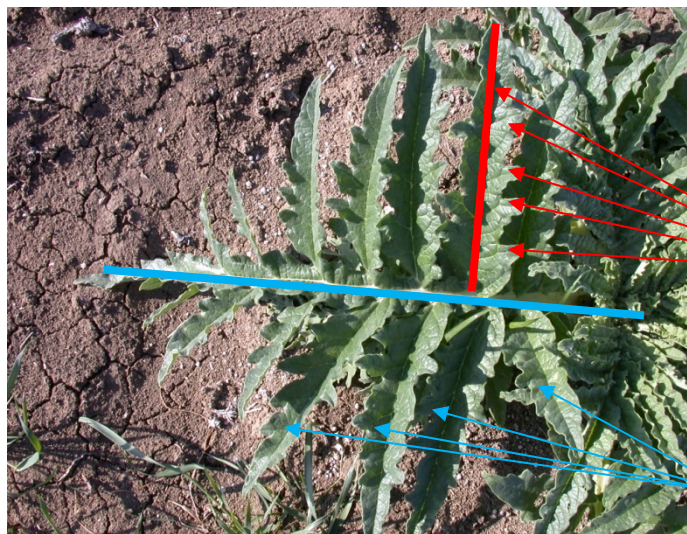


2
nearly right angle



3
obtuse

Ad. 10: Lobe: number of secondary lobes

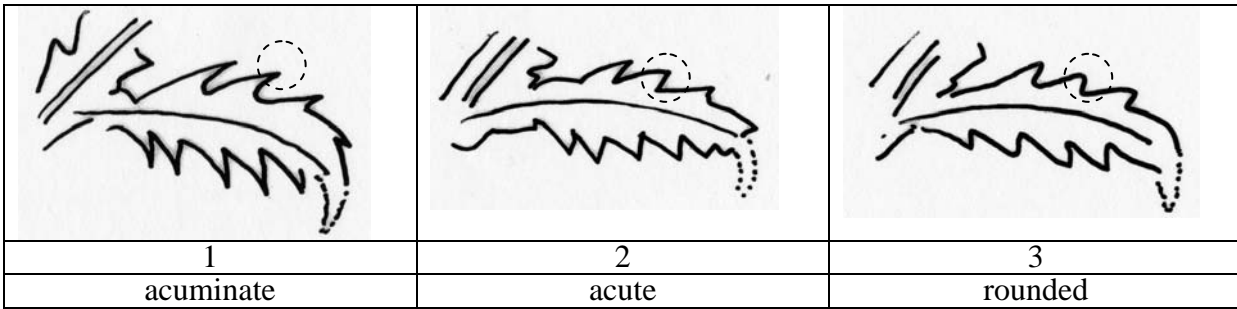


Secondary lobes

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)



Ad. 17: Plant: number of lateral shoots on main stem

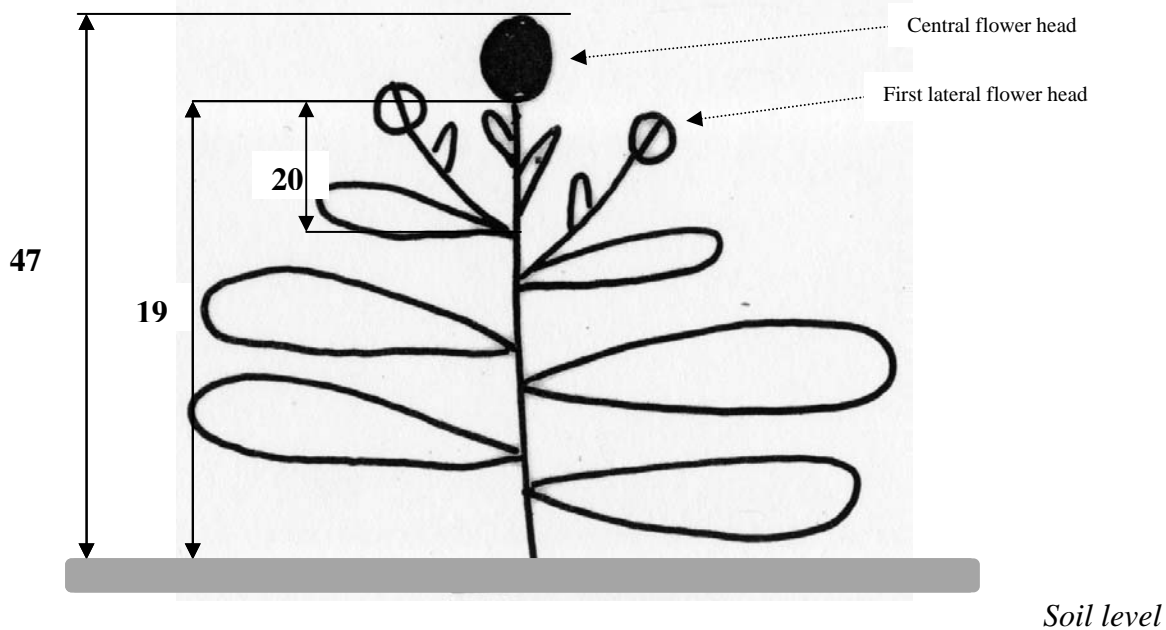
Ad. 48: Tendency to produce lateral shoot at base

relation between these characteristics, drawings to be provided

Ad. 19: Main stem: height to the base to the central flower head

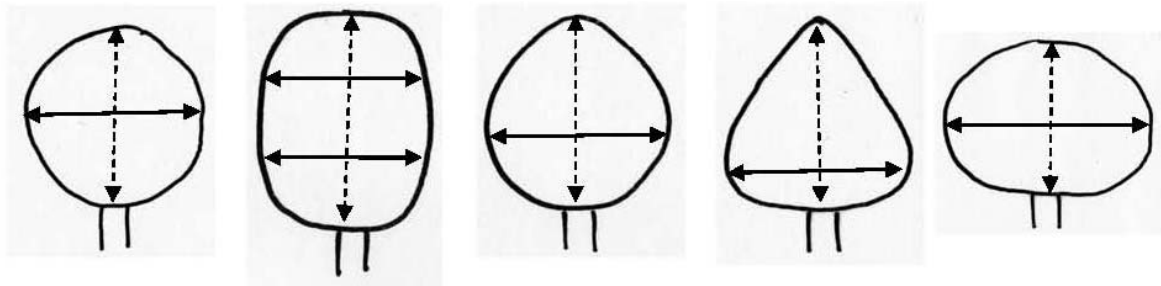
Ad. 20: Main stem: distance between central flower head and the youngest well developed leaf

Ad. 47: Plant: maximum height at full flowering (central and secondary flower heads included)



Ad. 24: Central flower head: shape in longitudinal section

Ad. 45: First flower head on lateral shoot: shape in longitudinal section



1 circular 2 broad elliptic 3 ovate 4 triangular 5 transverse broad elliptic

←→ Maximum diameter = d ←-----→ Maximum height = h

1. Circular : $d \sim h$
2. Broad ovate: $d_1 \sim d_2 \ll h$
3. Ovate: d is in the medium third of the flower head height
4. Triangular: d is in the basal third of the flower head height
5. Transverse broad elliptic: $d \gg h$

Ad. 25: Central flower head: shape of tip

Ad.25: Central flower head: shape of tip

<i>To be provided</i>			
1	2	3	4
acute	rounded	flat	depressed

Ad. 27: Central flower head: density of inner bract



3
sparse



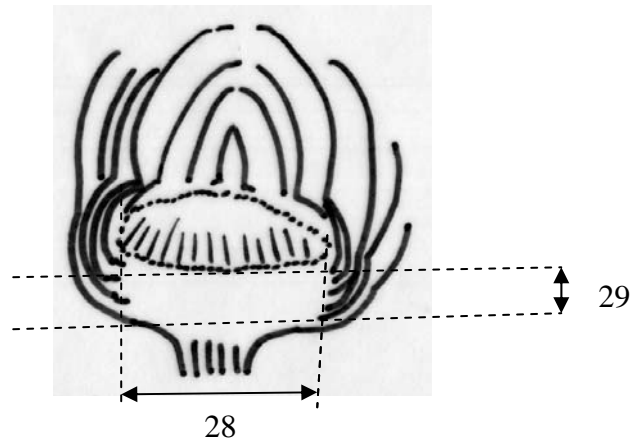
5
medium



7
dense

Ad. 28: Receptacle: diameter

Ad. 29: Receptacle: thickness



Ad. 30: Receptacle: shape in longitudinal section



3
flat



5
slightly depressed



7
strongly depressed

Ad. 36: Outer bract: reflexing of tip



1
absent

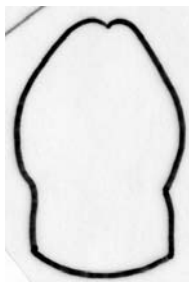


2
towards center of flower head



3
towards outside of flower head

Ad. 38: Outer bract: mucron

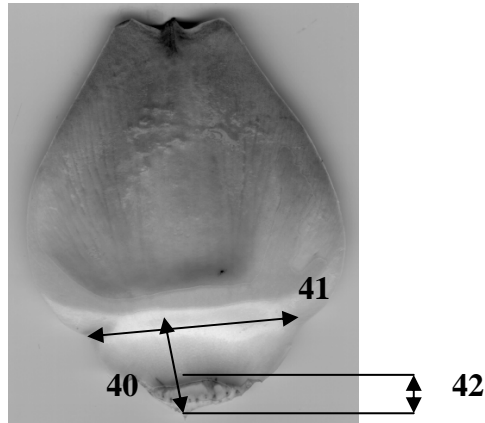


1
absent

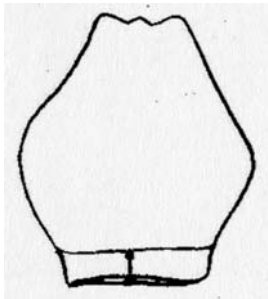


9
present

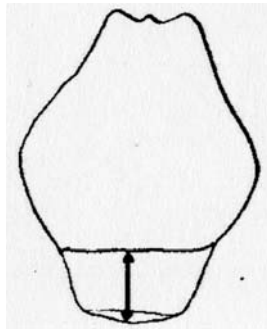
Ad. 40, 41, 42: Outer bract: length of base (40), width of base (41), thickness of base (42)



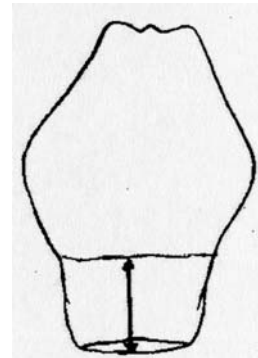
Ad. 40: Outer bract: length of base



3
short

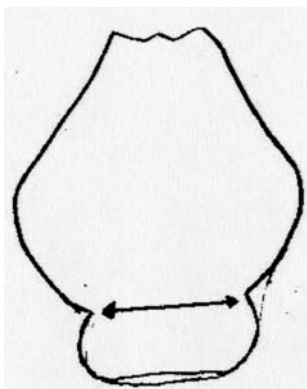


5
medium

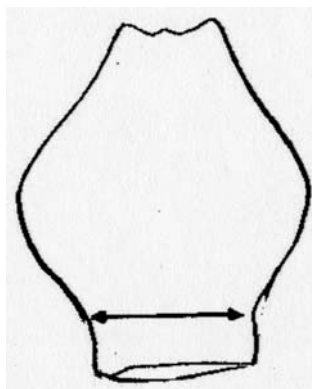


7
long

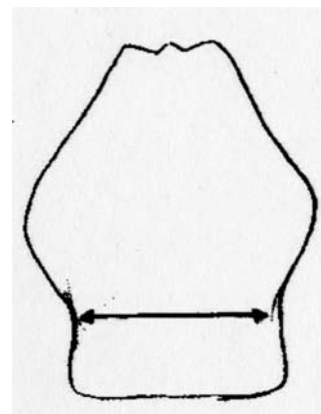
Ad. 41: Outer bract: width of base



3
narrow



5
medium



7
broad

Ad. 42: Outer bract: thickness of base



3
thin



5
medium



7
thick

9. Literature

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

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

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)		
1.1.1 Botanical name	<input type="text" value="Cynara cardunculus var. scolymus (L.) Benth."/>	
1.1.2 Common name	<input type="text" value="Globe Artischoke"/>	
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: intensity of lobing (5)		
weak	Tudela, Violet de Provence	3 []
medium		5 []
strong		7 []
5.2 Central flower head: time of appearance (18)		
early	Chrysanthème, Tudela	3 []
medium	Blanc Hyerois	5 []
late	Camus de Bretagne	7 []
5.3 Central flower head: shape in longitudinal section (24)		
circular	Castel, Green Globe	1 []
broad elliptic	Chrysanthème, Vert de Provence	2 []
ovate	Cric, Salambo	3 []
triangular	Tudela, Violet de Provence	4 []
transverse broad elliptic	Carène, Pètre	5 []
5.4 Central flower head: shape of tip (25)		
acute	Violet de Provence	1 []
rounded	Camus de Bretagne	2 []
flat	Chrysanthème	3 []
depressed	Carène, Pètre	4 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.5 Outer bract: color (external side) (32)		
green	Blanc Hyerois, Tudela, Vert de Provence	1 []
green striped with violet	Violet de Provence	2 []
violet striped with green	Chrysanthème	3 []
mainly violet	Cric, Salambo	4 []
entirely violet	Velours	5 []

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>
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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	<input type="text"/>		
Signature	<input type="text"/>	Date	<input type="text"/>

[Annex follows]

ANNEX

^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]
Gemüseartichocke (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 Globe Artichoke (TG/184/4) under the botanical name *Cynara cardunculus* var. *scolymus* (L.) Benth.
- The test Guideline for Cardoon (TG/CARD/---) under the botanical name *Cynara cardunculus* L..

[End of document]