CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Cichorium intybus L. var. *foliosum* Hegi

LEAF CHICORY

UPOV Code: CICHO_INT_FOL

Adopted on 31/03/2023

Entry into force on 01/02/2023

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CPVO-TP/154/2-Rev

1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of *Cichorium intybus* L. var. *foliosum* Hegi.

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf), its associated TGP documents (http://www.upov.int/tgp/en/) and the relevant UPOV Test Guideline TG/154/4 dated 05/04/2017 (https://www.upov.int/edocs/tgdocs/en/tg154.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01.02.2023**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for submitting of plant material for the first test period.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than two weeks after the date of the request for technical examination by the CPVO.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report.

If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior pertinent agreement, on matters of particular urgency, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

2. MATERIAL REQUIRED

2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on https://public.plantvarieties.eu/publication in the special issue S2/S3 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that

- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
- 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.

2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

The minimum duration of tests should normally be two independent growing cycles.
The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness" http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf.

3.3 Conditions for Conducting the Examination

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

3.4 Test design

3.4.1 Each test should be designed to result in a total of at least 100 plants, which should be divided between at least 2 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 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characteristics listed in the protocol.

3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection
The variety collection shall comprise variety descriptions and living plant material, thus a living reference collection. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

3.6.2 Living Plant Material
The EO shall collect and maintain living plant material of varieties of the species concerned in the variety collection.

3.6.3 Range of the variety collection
The living variety collection shall cover at least those varieties that are suitable to climatic conditions of a respective EO.

3.6.4 Making an inventory of varieties of common knowledge for inclusion in the variety collection
The inventory shall include varieties protected under National PBR (UPOV contracting parties) and Community PBR, varieties registered in the Common Catalogue, the OECD list, the Conservation variety list and varieties in trade or in commercial registers for those species not covered by a National or the Common Catalogue.

3.6.5 Maintenance and renewal/update of a living variety collection
The EO shall maintain seeds in conditions which will ensure germination and viability, periodical checks, and renewal as required. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material.

4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 Distinctness

4.1.1 General recommendations
It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

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 Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

4.1.4 Number of plants/parts of plants to be examined
Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 60 plants or parts taken from each of 60 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of observation

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

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

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

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

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

4.2 Uniformity

4.2.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

4.2.2 This Technical Protocol has been developed for the examination of seed propagated varieties and vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the UPOV-General Introduction to DUS and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed.

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

4.2.4 For the assessment of uniformity of seed propagated inbred lines and hybrids, a population standard of 3% and an acceptance probability of at least 95% should be applied; In the case of a sample size of 100 plants, 6 off-types are allowed. In addition, the same population standard and acceptance probability should apply to clear cases of out-crossed plants in inbred lines as well as plants obviously resulting from the selfing of a parent line in hybrids.

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 100 plants, 3 off-types are allowed.

4.3 Stability

4.3.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (http://www.upov.int/edocs/tgpdocs/en/tgp_11.pd)

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

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

5. GROUPING OF VARIETIES AND ORGANISATION 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 organise the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics.

a) Leaf: anthocyanin coloration (characteristic 7)

b) Leaf: colour (characteristic 8)

c) Plant: head formation (characteristic 20)

d) Head: shape in longitudinal section (characteristic 25)

In a first step, the collection should be divided according to types as described in the Table 1. In cases of doubt to which type a variety belongs to, it should be tested under consideration of all relevant types.

5.4 If other characteristics than those from the Technical Protocol are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.

5.5 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS and document TGP/9 "Examining Distinctness".

Table 1: Classification of types according to characteristics

Plant: type	**Plant: diameter (char. 2)**	**Leaf: length (char. 4)**	**Leaf: width (char. 5)**	**Leaf: colour (char. 8)**	**Leaf: anthocyanin distribution (char. 9)**	**Plant: head formation (char. 20)**	**Time of head formation (char. 21)**	**Head: shape in longitudinal section (char. 25)**	**Head: colour of cover leaves (char. 29)**	**Plant: formation of stem (char. 31)**
Chioggia	medium to large (notes 5-7)	very short to medium (notes 1- 5)	medium to broad (notes 5-7)	dark green (note 4)	**diffused only**	**closed**	very early to very late (notes 1-9)	circular to oblate (notes 3-4)	medium to dark red (notes 7-8)	absent
Verona	small to medium (notes 3-5)	medium (note 5)	medium to broad (notes 5-7)	medium green (note 3)			very early to very late (notes 1-9)	ovate (note 2)	medium red (note 7)	absent
Rossa di Treviso precoce	medium (note 7)	long (note 7)	narrow (note 5)	medium red (note 6)			very early to late (notes 1-7)	elliptic (note 1)	medium red (note 7)	absent
Pan di Zucchero/ Pain de Sucre	large (note 7)	medium to long (notes 5-7)	very broad (note 9)	light green to medium green (notes 2-3)	**absent**		medium (note 5)	elliptic (note1)	light green (note 3)	absent
Bianca di Milano	medium (note 5)	medium (note 5)	broad (note 7)	yellowish green to light green (notes 1-2)			early (note 3)	ovate (note 2)	light green (note 3)	absent
Bianca invernale	large (note 7)	medium to long (notes 5-7)	medium to broad (notes 5-7)	yellowish green to light green (notes 1-2)			late (note 7)	ovate (note 2)	light green to medium green (notes 3-4)	absent
Variegata di Castelfranco	medium to large (notes 5-7)	medium (note 5)	broad (note 7)	light green (note 2)	**in patches only**		medium to late (notes 5-7)	ovate (note 2)	yellowish green (note 2)	absent
Variegata di Lusia	large (note 7)	medium to large (notes 5-7)	broad (note 7)	light green (note 2)			early to late (notes 3-7)	oblate (note 4)	yellowish green (note 2)	absent

Plant: type	**Plant: diameter (char. 2)**	**Leaf: length (char. 4)**	**Leaf: width (char. 5)**	**Leaf: colour (char. 8)**	**Leaf: anthocyanin distribution (char. 9)**	**Plant: head formation (char. 20)**	**Time of head formation (char. 21)**	**Head: shape in longitudinal section (char. 25)**	**Head: colour of cover leaves (char. 29)**	**Plant: formation of stem (char. 31)**
Variegata di Chioggia	medium to large (notes 5-7)	medium (note 5)	broad (note 7)	medium green (note 3)	**diffused and in patch**		late to very late (notes 7-9)	circular (note 3)	whitish green (note 1)	absent
A grumolo verde	small (note 3)	short (note 3)	narrow to medium (notes 3-5)	light green to dark green (notes 2- 4)	**absent**	**open**				absent
Améliorée Blonde or Verte	medium (note 5)	short to medium (notes 3-5)	medium (note 5)	light green to dark green (notes 1-4)	**absent**					absent
Rosa isontina	medium (note 5)	short (note 3)	medium (note 5)	dark red (note 7)	**diffused only**					absent
Rossa di Treviso 2	large (note 7)	long (note 7)	narrow (note 3)	medium green (note 3)	**diffused only**	**absent**				absent
Catalogna	medium to very large (notes 5-9)	long to very long (notes 7-9)	narrow (note 3)	light to medium green (notes 2-3)	**absent**					absent
Catalogna Puntarelle	small to medium (notes 3-5)	long (note 7)	very narrow (note 1)	medium to dark green (notes 3-4)						present
Barbe de Capucin	medium (note 5)	long (note 7)	very narrow to narrow (notes 1-3)	medium to dark green (notes 3-4)						absent

6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

6.2. States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

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

6.3 Example Varieties

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

6.4 Legend

For column 'CPVO N°':

G	Grouping characteristic	-see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	-see Chapter 8.2

For column 'UPOV N°':

The numbering of the characteristics is provided as a reference to the UPOV guideline.

(*)	UPOV Asterisked characteristic	- Characteristics that are important for the international harmonization of variety descriptions.

For column 'Stage, method':

MG, MS, VG, VS		-see Chapter 4.1.5
(a)-(b)	Explanations covering several Characteristics	-see Chapter 8.1

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+)	**1. (*)**	**VG**	**Young plant: anthocyanin coloration**		
QL			absent	Améliorée blonde, Pan di zucchero	1
			present	Palla rossa 2, Rossa di Treviso precoce	9
2.	**2. (*)**	**MS/VG**	**Plant: diameter**		
QN		**(a)**	very small	Triestina da taglio	1
			very small to small		2
			small	A grumolo verde, Firestorm	3
			small to medium		4
			medium	Granato, Rossa di Treviso precoce	5
			medium to large		6
			large	Pan di zucchero	7
			large to very large		8
			very large	Catalogna puntarelle a foglia frastagliata, Tobago	9
3.	**3. (*)**	**VG**	**Leaf: attitude**		
QN		**(a), (b)**	erect	Clio, Spadona	1
			erect to semi erect		2
			semi erect	Palla rossa 2	3
			semi erect to horizontal		4
			horizontal	Selvatica da campo	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
4.	**4. (*)**	**MS/VG**	**Leaf: length**		
QN		**(a), (b)**	very short		1
			very short to short		2
			short	A grumolo verde	3
			short to medium		4
			medium	Rossa di Verona precoce	5
			medium to long		6
			long	Pan di zucchero	7
			long to very long		8
			very long	Catalogna a foglie frastagliate	9
5.	**5. (*)**	**MS/VG**	**Leaf: width**		
QN		**(a), (b)**	very narrow	Catalogna puntarelle a foglia stretta	1
			very narrow		2
			narrow	Rossa di Treviso 2	3
			narrow to medium		4
			medium	Rossa di Treviso precoce	5
			medium to broad		6
			broad	Variegata di Castelfranco	7
			broad to very broad		8
			very broad	Palla rossa 5	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6. (+)	**6.**	**VG**	**Leaf: shape**		
PQ		**(b)**	broad oblate		1
			circular	Palla rossa 4	2
			broad elliptic	Pan di zucchero, Rossa di Verona tardiva	3
			medium elliptic	Rossa di Treviso precoce	4
			narrow elliptic	Rossa di Treviso 2	5
			oblanceolate	Catalogna del Veneto, Clio	6
7.	**7. (*)**	**VG**	**Leaf: anthocyanin coloration**		
QL		**(a), (b)**	absent	Pan di zucchero	1
G			present	Palla rossa 2	9
8. (+)	**8. (*)**	**VG**	**Leaf: colour**		
PQ		**(a), (b)**	yellowish green	Bianca di Milano	1
			light green	A grumolo bionda, Rosa	2
			medium green	A grumolo verde	3
			dark green	A grumolo verde scuro	4
			light red		5
			medium red	Rossa di Treviso precoce	6
			dark red	Rosa isontina	7
G			very dark red	Caravaggio	8
9. (+)	**9. (*)**	**VG**	**Leaf: anthocyanin distribution**		
PQ		**(a), (b)**	diffused only	Palla rossa 2	1
			in patches only	Variegata di Castelfranco, Variegata di Lusia	2
			diffused and in patches	Variegata di Chioggia	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
10	**10**	**VG**	**Only varieties with anthocyanin coloration: present: Leaf: anthocyanin distribution: "diffused only": Leaf: area of diffused anthocyanin coloration**		
QN		**(a), (b)**	very small	Variegata di Lusia	1
			very small to small		2
			small	Palla Rossa 2, Variegata di Chioggia	3
			small to medium		4
			medium	Granato	5
			medium to large		6
			large	Caravaggio	7
			large to very large		8
			very large		9
11	**11**	**VG**	**Only varieties with Leaf: anthocyanin distribution: in patches only or diffused and in patches: Leaf: area of anthocyanin coloration**		
QN		**(a), (b)**	very small	Variegata di Lusia	1
			very small to small		2
			small	Variegata di Castelfranco	3
			small to medium		4
			medium	Variegata di Chioggia	5
			medium to large		6
			large	Variegata di Adria	7
			large to very large		8
			very large		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
12.	**12.**	**VG**	**Leaf: colour of midrib**		
PQ		**(a), (b)**	whitish	Bianca di Milano, Bianca invernale, Pan di zucchero	1
			green	A grumolo verde, Katrina	2
			red	Medusa	3
13.	**13.**	**VG**	**Leaf: profile of upper side in longitudinal section**		
QN		**(a), (b)**	strongly concave	Botticelli, Indigo	1
			weakly concave	Grumolo verde scuro	2
			flat	Rossa di Treviso 2	3
			weakly convex	Granato, Rossa di Treviso precoce, Uranus	4
			strongly convex	A grumolo verde	5
14	**14**	**VG**	**Leaf: profile of margin at apical zone**		
QN		**(a), (b)**	strongly concave	Verona	1
			weakly concave	Giove	2
			flat	Pan di zucchero	3
			weakly convex	Granato	4
			strongly convex		5
15.	**15.**	**VG**	**Leaf: glossiness**		
QN		**(a), (b)**	absent or weak	Jupiter, Rosa	1
			weak to medium		2
			medium	Variegata di Chioggia	3
			medium to strong		4
			strong		5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16.	**16. (*)**	**VG**	**Leaf: blistering**		
QN		**(a), (b)**	absent or very weak	Variegata di Castelfranco	1
			weak	Pan di zucchero, Rossa di Verona precoce	2
			medium	Bianca di Milano, Uranus	3
			strong	Mantovana	4
			very strong		5
17.	**17.**	**VG**	**Leaf: undulation of margin**		
QN		**(a), (b)**	absent or very weak	A grumolo verde scuro, Rossa di Treviso 2	1
			weak	Zuccherina di Trieste	2
			medium	Bianca di Milano	3
			strong	Barbe de Capucin	4
			very strong		5
18.	**18. (*)**	**VG**	**Leaf: incisions of margin**		
QN		**(a), (b)**	absent or very shallow	Rossa di Treviso 2	1
			very shallow to shallow		2
			shallow	A grumolo bionda	3
			shallow to medium		4
			medium	24 ore	5
			medium to deep		6
			deep	Catalogna gigante di Chioggia, Katrina	7
			deep to very deep		8
			very deep	Catalogna puntarelle di Gaeta, Catalogna puntarelle di Galatina	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19. (+)		**VG**	**Leaf: type of incisions of margin**		
PQ		**(a), (b)**	sinuate	Variegata di Lusia, Zuccherina di Trieste	1
			dentate	Catalogna gigante di Chioggia, Koryvos, Pan di zucchero, Variegata di Castelfranco	2
			serrate	Barbe de Capucin, Catalogna a foglie frastagliate	3
20.	**19. (*)**	**VG**	**Plant: head formation**		
PQ		**(a)**	absent	Catalogna puntarelle a foglia stretta, Clio	1
			open	A grumolo verde, Corma	2
G			closed	Bianca invernale, Palla rossa 2, Pan di zucchero, Rossa di Treviso precoce	3
21. (+)	**20. (*)**	**MG**	**Only for varieties with head formation: Time of head formation**		
QN		**(a)**	very early	Palla rossa 2, Rossa di Verona precoce	1
			very early to early		2
			early	Palla rossa 3	3
			early to medium		4
			medium	Palla rossa 4, Pan di zucchero	5
			medium to late		6
			late	Palla rossa 5, Rossa di Verona tardiva, TT506	7
			late to very late		8
			very late	Palla rossa 6, Tobago, Variegata di Chioggia	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
22.	**21. (*)**	**VG**	**Head: density**		
QN		**(a)**	very loose		1
			very loose toloose		2
			loose	Améliorée blonde, Grumolo verde scuro	3
			loose to medium		4
			medium	A grumolo bionda, Bianca di Bergamo, Pan di zucchero	5
			medium to dense		6
			dense	Palla rossa 2, Variegata di Chioggia	7
			dense to very dense		8
			very dense		9
23.	**22. (*)**	**MS/VG**	**Head: length**		
QN		**(a)**	very short		1
			very short to short		2
			short	A grumolo verde	3
			short to medium		4
			medium	Bianca di Milano, Jupiter, Palla rossa 4	5
			medium to long		6
			long	Rossa di Treviso precoce	7
			long to very long		8
			very long		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
24.	**23. (*)**	**VG**	**Head: diameter**		
QN		**(a)**	very small	A grumolo verde scuro	1
			very small to small		2
			small	Rossa di Treviso precoce	3
			small to medium		4
			medium	Mantovana, Rossa di Verona precoce	5
			medium to large		6
			large	Bianca di Milano	7
			large to very large		8
			very large	Averto, Gloria	9
25. (+)	**24. (*)**	**VG**	**Head: shape in longitudinal section**		
PQ		**(a)**	ovate	Rossa di Verona precoce	1
			oblate	Palla rossa 5	2
			circular	Variegata di Chioggia	3
G			elliptic	Pan di zucchero, Rossa di Treviso precoce	4
26. (+)	**25. (*)**	**VG**	**Head: shape of upper part**		
QN		**(a)**	flattened	Variegata di Lusia	1
			rounded	Lava, Palla rossa 2, Variegata di Chioggia	2
			pointed	Pan di zucchero, Granato, Rossa di Verona precoce	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
27.	**26. (+)**	**VG**	**<u>Only varieties with Plant: head formation: closed:</u> Head: degree of overlapping of upper part of leaves**		
QN		**(a)**	very weak	Pan di zucchero	1
			very weak to weak		2
			weak	Bianca invernale	3
			weak to medium		4
			medium	Nerone, Rossini	5
			medium to strong		6
			strong	Rossa di Verona precoce	7
			strong to very strong		8
			very strong	Tobago	9
28.	**27. (*)**	**VG**	**Head: anthocyanin coloration of cover leaves**		
QL		**(a)**	absent	Pan di zucchero	1
			present	Variegata di Chioggia, Variegata di Lusia	9
29.	**28. (*)**	**VG**	**Head: colour of cover leaves**		
PQ		**(a)**	whitish green	Variegata di Chioggia	1
			yellowish green	Bianca invernale, Variegata di Lusia	2
			light green	A grumolo bionda, Pan di zucchero	3
			medium green	A grumolo verde	4
			dark green	A grumolo verde scuro, Catalogna puntarelle a foglia frastagliata	5
			light red	Rosa	6
			medium red	Rossa di Verona precoce	7
			dark red	Nerone, Rosa isontina	8
			very dark red	Caravaggio	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
30.	**29. (*)**	**VG**	**Head: distribution of anthocyanin coloration of cover leaves**		
PQ		**(a)**	entire	Rosa isontina	1
			diffused only	Palla rossa 2	2
			in patches only	Variegata di Castelfranco	3
			diffused and in patches	Variegata di Chioggia	4
			densely speckled	Tauro	5
31. (*)	**30.**	**VG**	**Plant: formation of stem**		
QL		**(a)**	absent	Palla rossa 2	1
			present	Catalogna puntarelle a foglia frastagliata	9
32.	**31.**	**VG**	**Stem: degree of fasciation**		
QN		**(a)**	very weak		1
			very weak to weak		2
			weak	Catalogna puntarelle a foglia stretta	3
			weak to medium		4
			medium	Catalogna puntarelle a foglia frastagliata	5
			medium to strong		6
			strong	Catalogna puntarelle di Galatina	7
			strong to very strong		8
			very strong		9
33.	**32.**	**VG**	**Flower: colour**		
QL			white	Koryvos	1
			blue	Barbe de Capucin	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
34.	**33.**	**MG/VG**	**Time of beginning of bolting**		
QN			very early	Catalogna pugliese, Koryvos	1
			very early to early		2
			early	Poncho	3
			early to medium		4
			medium		5
			medium to late		6
			late	Rosa isontina, TT506	7
			late to very late		8
			very late	TT706	9

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

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

a) Plant and head: Observations on the plant should be made just at harvest maturity stage that is specific to the plant types: Chioggia, Verona, Pain de sucre / Pan di Zucchero, Variegata and Rossa di Treviso (early type) are harvested when a head has been formed; Catalogna puntarelle is harvested when stems (puntarelle shoots) are formed and the leaves development is complete.

All over types: when the leaves are at the stage of complete growth.

b) Observations should be made on leaves excluding the outer and centre leaves and midrib.

8.2 Explanations for individual characteristics

Ad. 1: Young plant: anthocyanin coloration at 5-6 leaf stage

Observations should be made at 5-6 leaf stage.

Ad. 6: Leaf: shape

width (ratio length/width)	<- broadest part ->	
	at middle	above middle
narrow (high)	 5 narrow elliptic	 6 oblanceolate
medium (medium)	 4 medium elliptic	
	 3 broad elliptic	
	 2 circular	
broad (low)	 1 broad oblate	

Ad. 8: Leaf: colour

To observe the total area excluding midrib.

Ad. 9: Leaf: anthocyanin distribution

1
diffused only

2
in patches only

3
diffused and in patches

Ad. 19: Leaf: type of incisions of margin

1
sinuate

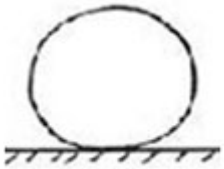
2
dentate

3
serrate

Ad. 21: Time of head formation

Time of head formation is assessed by counting the number of days between the transplanting into the field and the harvest maturity period (when the observation on head should be made). The translation of this number to a level of expression of the scale is based on the example varieties.

Ad. 25: Head: shape in longitudinal section

width (ratio length/width)	<- broadest part ->	
	below middle	at middle
narrow (high)		 4 elliptic
medium (medium)	 1 ovate	 3 circular
broad (low)		 2 oblate

Ad. 26: Head: shape of upper part

1 flattened | 2 rounded | 3 pointed

Ad. 27: Only varieties with Plant: head formation: closed: Head: degree of overlapping of upper part of leaves

Observations should be made on leaves at the heart of the plant to form a head.

8.3 Leaf chicory types

1. Chioggia


in development


at maturity

2. Verona


in development


at maturity

3. Rossa di Treviso precoce


in development


at maturity

4. Pan di zucchero/Pain de sucre

5. Bianca di Milano

6. Bianca invernale

7. Variegata di Castelfranco


in development


at maturity

8. Variegata di Lusia


in development


at maturity

9. Variegata di Chioggia

10. A grumolo verde

11. Améliorée blonde or verte


Améliorée blonde


Améliorée verte

12. Rosa isontina

13. Rossa di Treviso 2


in development


at maturity

14. Catalogna


Catalogna del Veneto


Spadona


Clio

15. Catalogna Puntarelle

Catalogna puntarelle a foglia frastagliata

Catalogna puntarelle di Galatina

16. Barbe de Capucin

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/154/2-Rev - *Cichorium intybus* L. var. *foliosum* Hegi – leaf chicory

Link to e-TQ:
https://online.plantvarieties.eu/backOfficeFormQuestions?viewFormId=12299&viewFormType=TQ&viewFormLang=EN&speciesName=cichor&type=2&status=1,2&pageSize=50