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

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Brassica napus L. var. *napobrassica* (L.) Rchb.

SWEDE, RUTABAGA

UPOV Code: BRASS_NAP_NBR

Adopted on 23/04/2024

Entry into force on 01/05/2025

CPVO-TP/089/1 Rev. based on the version 5 of the CPVO-TP/template

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CPVO-TP/089/1 Rev

1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of ***Brassica napus* L. var. *napobrassica* (L.) Rchb.**

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/89/6 Rev. 2 dated 24/10/2023 (https://www.upov.int/edocs/tgdocs/en/tg089.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01.05.2025**. 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 growing cycle.

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 four weeks after the date of the request for technical examination by the CPVO and in any case preferably before the submission period of the plant material.

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

In cases where the Examination Office identifies issues during the course of the technical examination that may lead to a negative report, the Examination Office shall inform the CPVO and in urgent cases the applicant/holder as soon as such issues become obvious.

1.3.3 Sample keeping in case of problems

As far as feasible the Examination Office shall keep a representative sample of any relevant testing material of the candidate variety and reference variety(ies) if the technical examination has resulted in a negative report. As soon as possible, the CPVO shall inform the Examination Office when the material can be destroyed.

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/she 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 submission of plant 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 in writing.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

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

The two independent growing cycles should be in the form of two separate plantings.

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.

The optimum stage of development for the assessment of each characteristic is indicated by a number in the third column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

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 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 common knowledge varieties that are suitable to grow in the 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 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.

The inventory shall take into account the list of varieties which are the subject of an on-going application for protection or official registration (candidate varieties).

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.

Living material in variety collections representing varieties for which a DUS test was carried out at that EO shall be renewed after verification in a side-by-side comparison. In case where no living material is available anymore in the collection, such verification could be done with any other test that has proven to give similar results 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 40 plants or parts taken from each of 40 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. 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 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the UPOV-General Introduction to DUS.

4.3 Stability

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.

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: type (characteristic 3)

b) Root: anthocyanin coloration of skin above soil (characteristic 13)

c) Root: intensity of anthocyanin coloration of skin above soil (characteristic 14.1 and 14.2)

d) Pseudostem: anthocyanin coloration between leaf scars (characteristic 20)

e) Root: colour of flesh (characteristic 21)

f) Male sterility (characteristic 23)

5.4 If characteristics other than those mentioned in the list of grouping characteristics and/or from the table of characteristics and/or from the Technical Questionnaire – sections 5 and 7. 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".

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

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 relevant states of expression are presented in the characteristic.

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)-(c)	Explanations covering several Characteristics	-see Chapter 8.1
00-470	Explanations on growth stages	-see Chapter 8.3

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1.	**1. (*)**	**VG**	**Leaf: intensity of green colour**		
QN		**100-150**	very light		1
		(a), (b)	very light to light		2
			light	Airlie	3
			light to medium		4
			medium	Marian	5
			medium to dark		6
			dark	Joan	7
			dark to very dark		8
			very dark		9
2.	**2.**	**VG**	**Leaf: intensity of waxiness**		
QN		**100-150**	very weak		1
		(a)	very weak to weak		2
			weak	Seefelder	3
			weak to medium		4
			medium		5
			medium to strong		6
			strong	Heinkenborsteler	7
			strong to very strong		8
			very strong		9
3. (+)	**3. (*)**	**VG**	**Leaf: type**		
QL		**80-150**	entire	Niko	1
G		**(a)**	lobed	Jaune à Collet Rouge, Magres	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
4. (+)	**4.**	**MS/VG**	**<u>Only lobed-leaf varieties</u>: Leaf: number of lobes**		
QN		**100-150**	very few		1
		(a)	very few to few		2
			few	Wilhelmsburger	3
			few to medium		4
			medium	Ruta Otofte	5
			medium to many		6
			many	Marian	7
			many to very many		8
			very many		9
5. (+)	**5. (*)**	**MS/VG**	**<u>Only lobed-leaf varieties</u>: Leaf: length of terminal lobe**		
QN		**100-150**	very short		1
		(a)	very short to short		2
			short	Laurentian	3
			short to medium		4
			medium	Sator Otofte	5
			medium to long		6
			long	Kenmore	7
			long to very long		8
			very long		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6. (+)	**6. (*)**	**MS/VG**	**<u>Only lobed-leaf varieties</u>: Leaf: width of terminal lobe**		
QN		**100-150**	very narrow		1
		(a)	very narrow to narrow		2
			narrow	Laurentian	3
			narrow to medium		4
			medium	Sator Otofte	5
			medium to broad		6
			broad	Kenmore	7
			broad to very broad		8
			very broad		9
7. (+)	**7. (*)**	**MS/VG**	**Leaf: length**		
QN		**100-150**	very short		1
		(a)	very short to short		2
			short	Excelsior	3
			short to medium		4
			medium	Ruta Otofte	5
			medium to long		6
			long	Teviotdale	7
			long to very long		8
			very long		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
8. (+)	**8. (*)**	**MS/VG**	**Leaf: width**		
QN		**100-150**	very narrow		1
		(a)	very narrow to narrow		2
			narrow	Dryden	3
			narrow to medium		4
			medium	Ruta Otofte	5
			medium to broad		6
			broad	Kenmore	7
			broad to very broad		8
			very broad		9
9.	**9.**	**VG**	**Leaf: undulation of margin**		
QN		**100-150**	absent or very weak	Helena, Lizzy	1
		(a)	very weak to weak		2
			weak		3
			weak to medium		4
			medium	Champion	5
			medium to strong		6
			strong		7
			strong to very strong		8
			very strong	Magres	9
10. (+)	**10. (*)**	**VG**	**Petiole: attitude**		
QN		**100-150**	erect		1
			erect to semi-erect		2
			semi-erect	Ruta Otofte	3
			semi-erect to horizontal		4
			horizontal	Brora, Helena	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	**11.**	**VG**	**Petiole: thickness**		
QN		**100-150**	very thin		1
			very thin to thin		2
			thin	Vogesa	3
			thin to medium		4
			medium	Marian	5
			medium to thick		6
			thick	Heinkenborsteler	7
			thick to very thick		8
			very thick		9
12. (+)	**12. (*)**	**VG**	**Root: predominant colour of skin above soil**		
PQ		**240-270**	green	Jaune à Collet Verte, Melfort, Seefelder	1
		(c)	bronze	Frise Gele, Harrietfield	2
			reddish purple	Angus, Jaune à Collet Rouge, Kenmore	3
13.	**13. (*)**	**VG**	**Root: anthocyanin coloration of skin above soil**		
QL		**240-270**	absent	Seefelder	1
G		**(c)**	present	Jaune à Collet Rouge, Ruta Otofte	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
14.1 (+)	**14.1 (*)**	**VG**	**<u>Only varieties with green or bronze skin colour</u>: Root: intensity of anthocyanin coloration of skin above soil**		
QN		**250-270**	very weak		1
		(c)	very weak to weak		2
			weak	Melfort	3
			weak to medium		4
			medium	Angus	5
			medium to strong		6
			strong	Kenmore	7
			strong to very strong		8
G			very strong		9
14.2	**14.2 (*)**	**VG**	**<u>Only varieties with reddish purple skin colour</u>: Root: intensity of anthocyanin coloration of skin above soil**		
QN		**250-270**	very weak		1
		(c)	very weak to weak		2
			weak	Champion	3
			weak to medium		4
			medium	Doon Major	5
			medium to strong		6
			strong	Ruby	7
			strong to very strong		8
G			very strong		9
15.	**15.**	**VG**	**Root: predominant colour of skin below soil level**		
PQ		**250-270**	white	Niko	1
		(c)	yellow	Jaune à Collet Verte, Mella	2
			orange pink	Jaune à Collet Rouge	3
			reddish	Marian	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16. (+)	**16. (*)**	**VG**	**Root: shape in longitudinal section**		
PQ		**260-299**	transverse elliptic	Acme, Seefelder	1
			circular	Jaune à Collet Verte, Ruby	2
			obovate	Kenmore	3
			square	Doon Major	4
			oblong	Blanc Hors Terre	5
17.	**17. (*)**	**MS/VG**	**Root: length**		
QN		**260-290**	very short		1
			very short to short		2
			short	Sator Otofte	3
			short to medium		4
			medium	Airlie, Ruby	5
			medium to long		6
			long	Aubigny Green Top	7
			long to very long		8
			very long		9
18.	**18. (*)**	**MS/VG**	**Root: diameter**		
QN		**260-290**	very small		1
			very small to small		2
			small	Laurentian	3
			small to medium		4
			medium	Ruta Otofte, Sator Otofte	5
			medium to large		6
			large	Kenmore	7
			large to very large		8
			very large		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19. (+)	**19. (*)**	**MS/VG**	**Pseudostem: length**		
QN		**260-299**	vey short		1
			very short to short		2
			short	Helena, Melfort	3
			short to medium		4
			medium	Ruta Otofte, Sator Otofte	5
			medium to long		6
			long	Vittoria	7
			long to very long		8
			very long		9
20.	**20. (*)**	**VG**	**Pseudostem: anthocyanin coloration between leaf scars**		
QL		**260-299**	absent or partial	Melfort, Merrick, Seefelder	1
G			solid	Champion, Magres	2
21.	**21. (*)**	**VG**	**Root: colour of flesh**		
PQ		**260-280**	white	Blanc Hors Terre, Merrick	1
G			yellow	Jaune à Collet Rouge, Magres	2
22.	**22.**	**VG**	**Root: intensity of yellow colour of flesh**		
QN		**260-280**	very light		1
			very light to light		2
			light	Doon Major	3
			light to medium		4
			medium	Magres	5
			medium to dark		6
			dark		7
			dark to very dark		8
			very dark		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
23. (+)	**23. (*)**	**VS/[1] MS**	**Male sterility**		
QL		**410-470**	absent	Magres	1
G			present	Tweed	9

[1] See document TGP/7 "Development of Test Guidelines", Annex 3 "Guidance Notes (GN) for the TG Template", GN 25 "Recommendations for conducting the examination" (http://www.upov.int/edocs/tgpdocs/en/tgp_7.pdf)

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

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

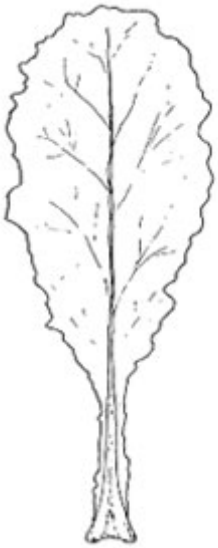
a) Unless otherwise indicated, all observations on the leaves should be made on the largest fully developed (non-senescent leaf).

b) Unless otherwise indicated, assessment of leaf colour should be made on leaves before powdery mildew infection is established.

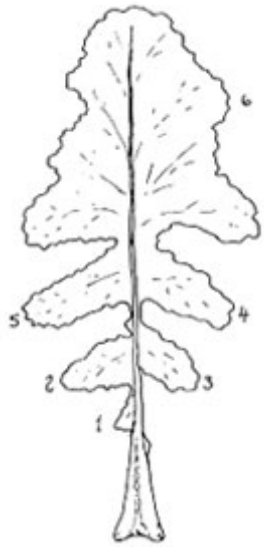
c) Unless otherwise indicated, all observations on the root skin colour should be made before cork development obscures the skin.

8.2 Explanations for individual characteristics

Ad. 3: Leaf: type



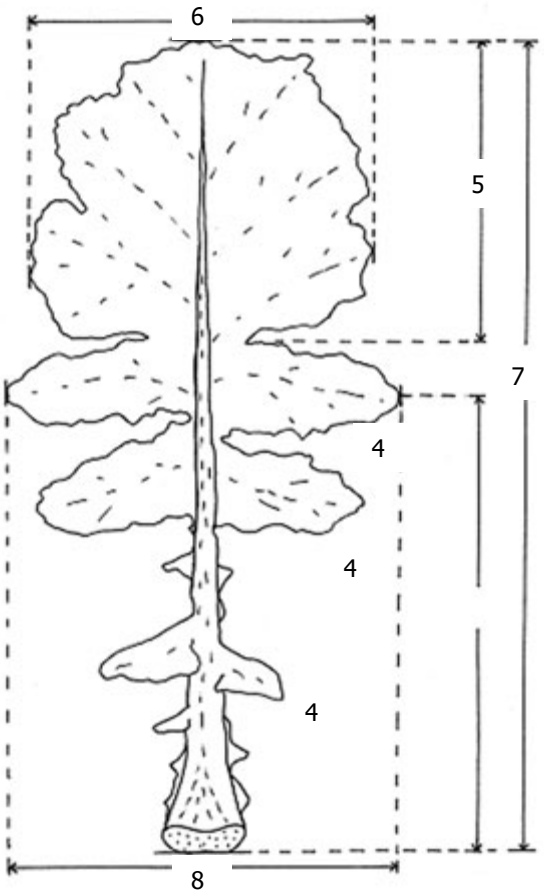
1
entire



2
lobed

Parts of the leaf blade are considered as lobes if their length is at least equivalent to the width of the leaf petiole at their point of attachment and if the upper notch of the blade has at least half the length of the lobe itself.

Ad. 4-8: Leaf characteristics



4. Leaf: number of lobes
(to be recorded on one side of the midrib only and excluding terminal lobe)

A lobe is defined as leaf tissue more than 2 cm in length which is cut on both sides to at least half the distance towards the midrib.

5. Leaf: length of terminal lobe

6. Leaf: width of terminal lobe

7. Leaf: length

8. Leaf: width

Ad. 10: Petiole: attitude

The petiole attitude should be assessed along the dotted line, ignoring any reflexing at the leaf tip.

Ad. 12: Root: predominant colour of skin above soil

Bronze roots may be characterised by the gradual transition from a predominantly green colour to predominantly bronze. This can be observed on the mature root before cork reduces the clarity of the skin colour. Bronze skin colour should be confirmed by comparison with the example varieties.

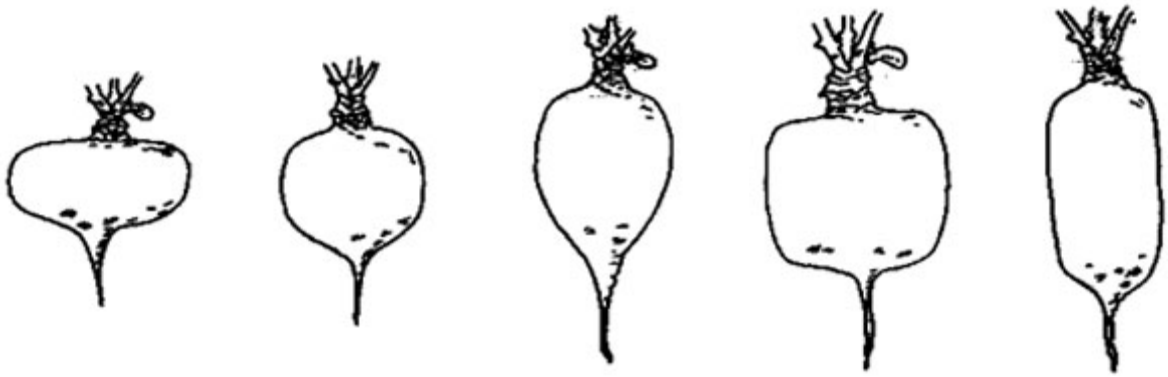
Ad. 14.1: Root: intensity of anthocyanin coloration of skin above soil (green or bronze skinned varieties only)

The expression of the root skin colour in Swede would appear to be a simple observation with three clear states of expression: green, purple or bronze.

On closer examination some green skinned varieties have light anthocyanin, uniformly expressed, and should be classified as bronze skinned roots.

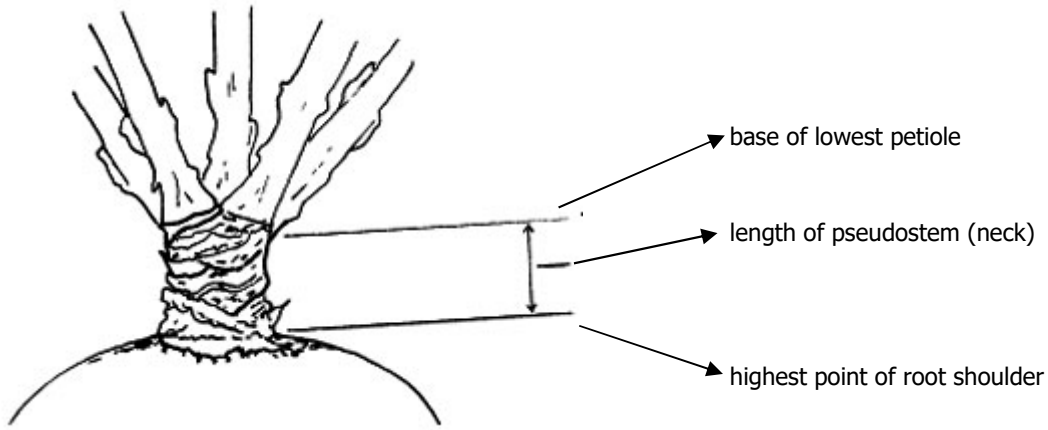
This characteristic should be recorded before the start of root cork development.

Ad. 16: Root: shape in longitudinal section



1	2	3	4	5
transverse elliptic	circular	obovate	square	oblong

Ad. 19: Pseudostem: length



Ad. 23: Male sterility

To be tested in a field trial and/or in a DNA marker test[2].

In the case of a field trial, the type of observation is VS. In the case of a DNA marker test, the type of observation is MS.

Field trial:

Observations should be made on fully opened flowers. Tapping or shaking the flowering stem will release pollen, which, if present, can be observed on dark coloured paper or card. The absence of pollen production is an indication of male sterility. The presence of pollen production is an indication of male fertility.

male fertile (pollen present) male sterile (pollen absent)

DNA marker test:

If the cytoplasmic male sterility (CMS) marker is absent, the variety is expected to have male fertile flowers. If the CMS marker is present, the variety is expected to have male sterile flowers.

In cases where the DNA marker test result does not confirm the declaration in the TQ, a field trial should be performed to observe whether the variety has male fertile or male sterile flowers due to another mechanism.

[2] The description of the method to test male sterility for *Brassica* (CMS marker) is covered by a trade secret. The owner of the trade secret, Syngenta Seeds B.V., has given its consent for the use of the CMS marker solely for the purposes of examination of Distinctness, Uniformity and Stability (DUS) and for the development of variety descriptions by UPOV and authorities of UPOV members. Syngenta Seeds B.V. declares that neither UPOV, nor authorities of UPOV members that use the CMS marker for the above purposes will be held accountable for possible (mis)use of the CMS marker by third parties. Please contact Naktuinbouw, Netherlands, to obtain the method and information on the CMS marker for the purposes mentioned above.

8.3 EXPLANATIONS ON GROWTH STAGES

Key to growth stages

00 Dry seed

0-10 Germination and emergence through soil

Seedling growth

12 Elongation of emerging shoot
15 Elongation and opening of cotyledons
20 Cotyledons fully opened
30 Cotyledons fully opened and full development of first true leaf
40 Second leaf fully developed
50 Third leaf fully developed and initial senescence of cotyledons
60 Fourth leaf fully developed and partial senescence of cotyledons
70 Fifth leaf fully developed and advanced senescence/drop of cotyledons

Leaf development

80 Sixth leaf fully developed;
90 Seventh leaf fully developed; initial senescence of first true leaf in early cultivars
100 Eighth leaf fully developed; 30 % senescence of first true leaf
110 Ninth leaf fully developed; 60% senescence of first true leaf
120 Tenth leaf fully developed; complete senescence and drop of first true leaf
130 Eleventh leaf fully developed.
140
150 Few leaf scars becoming exposed on root 'neck'
160
170
180 Many leaf scars exposed on root 'neck'

Root development

200 Slight swelling of the root at ground level
220 Development of a small swollen root above ground level
240 Swollen root medium
260 Root fully developed with no cork on skin
270 Root fully developed with 40% cork development on skin
280 Root fully developed with 80 - 100% cork development
290 Root flesh becoming pithy and fibrous
299 Root flesh fibrous and pithy

Flowering

400 First flower open on terminal raceme
410 Few flowers are open on terminal raceme
420 Full flowering; lower siliques are elongating
450 Lower siliques are starting to fill, less than 5% of flower buds are not yet open
470 Seeds in lower siliques are enlarging, all buds have opened

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO/TQ-089/1 Rev – *Brassica napus* L. var. *napobrassica* (L.) Rchb.