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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

UNION INTERNATIONALE POUR LA PROTECTION DES OBTENTIONS VÉGÉTALES

INTERNATIONALER VERBAND ZUM SCHUTZ VON PFLANZEN-ZÜCHTUNGEN

UNIÓN INTERNACIONAL PARA LA PROTECCIÓN DE LAS OBTENCIONES VEGETALES

DRAFT

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

SWEDE, RUTABAGA

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

These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Brassica napus* L. var. *napobrassica* (L.) Rchb.

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of seed to be supplied by the applicant in one or several samples should be:

50 g.

The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing seed in the country in which the application is made. The germination capacity should be as high as possible.

2. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

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

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The tests should be carried out under conditions ensuring normal growth. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include a total of 60 plants which should be divided between two or more replicates. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise indicated, all observations determined by measurement, weighting or counting should be made on 40 plants or parts taken from each of 40 plants.

2. For the assessment of uniformity of open-pollinated and hybrid varieties relative uniformity standard should be applied.

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

4. Assessment of leaf color should be made on leaves before powdery mildew infection is established.

5. Observations on root skin color should be made before cork development obscures the skin.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.

2. It is recommended that the competent authorities use the following characteristics for grouping varieties:

(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 (characteristics 14.1 and 14.2)
(d) Pseudostem: anthocyanin coloration between leaf scars (characteristic 20)
(e) Root: color of flesh (characteristic 21).

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.

2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of the different characteristics.

3. Legend

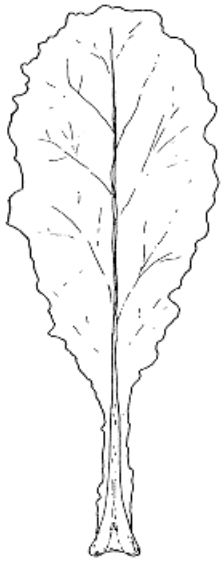
(*) Characteristics that should be used on all varieties in every growing cycle over which the examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.

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

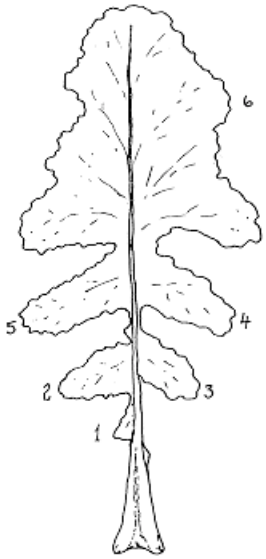
(1) The optimum stage of development (growth key) for the assessment of each characteristic is indicated by a number in the second column. The stages of development (growth key) denoted by each number are described at the end of Chapter VIII.

VIII. Explanations on the Table of Characteristics

Ad. 3: Leaf: type



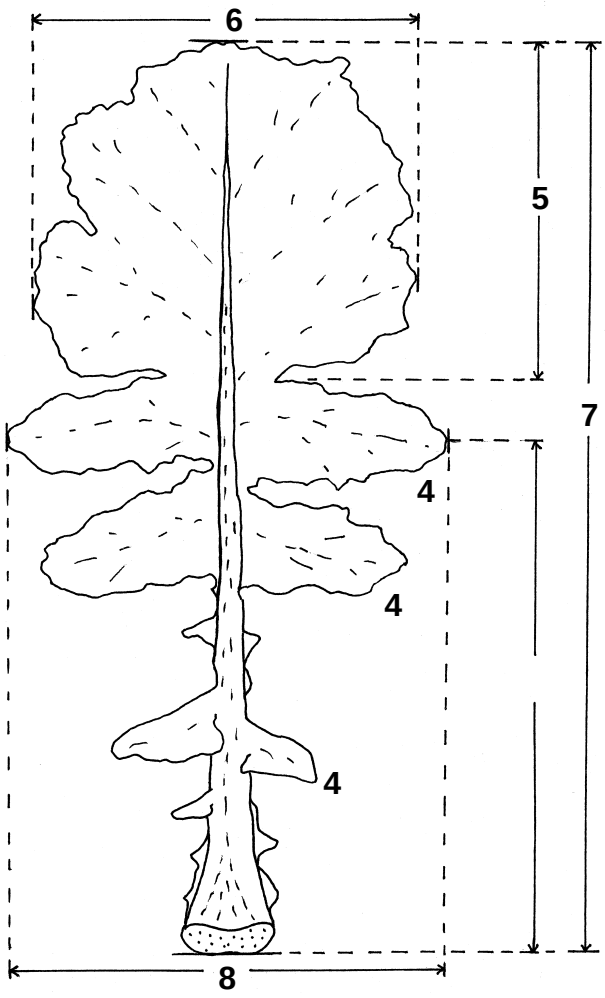
1
entire



9
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 major 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

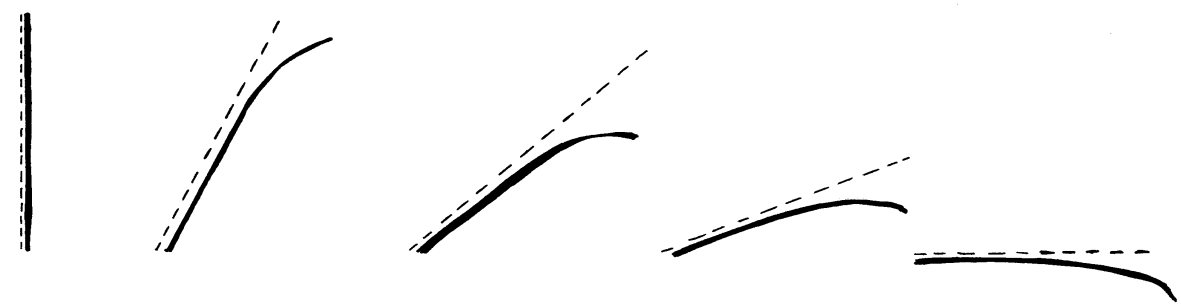
6. Leaf: width of terminal lobe

7. Leaf: length

8. Leaf: width

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

Ad. 10: Petiole: attitude



1	2	3	4	5
erect	erect to semi-erect	semi-erect	semi-erect to horizontal	horizontal

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

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

The characteristic describes the predominant color of the skin above soil over the whole root. Very slight expression of anthocyanin coloration should be ignored on green skinned roots.

The bronze skin color is defined as chlorophyll expression with partial, but clear, expression of anthocyanin.

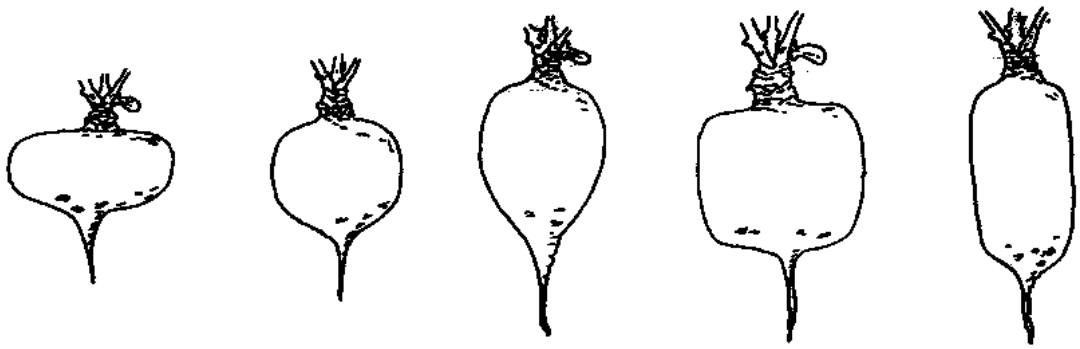
Ad. 14.1: Root: intensity of anthocyanin coloration of skin above soil
(Green or bronze skinned varieties only)

The expression of the root skin color 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 very slight anthocyanin expression and should be classified as bronze skinned.

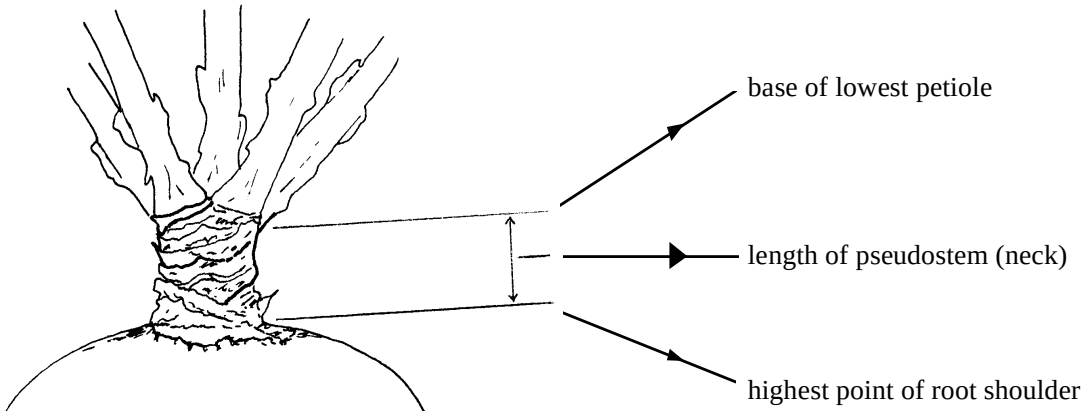
This characteristic should be recorded before the start of root cork development.

Ad. 16: Root: shape in longitudinal section



1	2	3	4	5
transverse elliptic	circular	obovate	square	oblong

Ad. 19: Pseudostem: length



Ad. 13 and 20: Root: anthocyanin coloration of skin above soil (13) and Pseudostem: anthocyanin coloration between leaf scars (20)

These two characteristics combined are used for the correct skin color classification as follows:

Pseudostem (neck) surface between leaf scars green and root skin color green	Green skinned Group
Pseudostem (neck) surface between leaf scars green and root skin color with small expression of anthocyanin	Bronze skinned Group
Pseudostem (neck) surface between leaf scars green mottled with purple and root skin color with small or extensive expression of anthocyanin	Bronze skinned Group
Pseudostem (neck) surface between leaf scars entirely purple with anthocyanin expressed on root skin	Purple skinned Group

Ad. 23: Root: dry matter content

The dry matter content of the root should not be observed when roots of early maturing varieties are fully developed and mature.

One core, approximately 15 mm in diameter, is sampled diagonally (45 degrees) through the root entering at the root shoulder. A core sampled diagonally is more representative of the root than a vertical or horizontal core. Roots are sampled randomly from each plot in each replication; malformed or damaged roots are excluded from the sample. The cores are placed in a polythene bag and sealed and labelled with the plot number. If there is an delay between sampling and weighing the cores, storage in a fridge will keep cores in good condition for up to 24 hours.

2 cm are cut off each end of the fifteen cores to remove the root skin and to reduce the harder tissue under the skin surface. The trimmed cores are weighed as a bulk and placed in a drying oven in trays with a mesh base to allow circulation of hot air.

The oven temperature is set at 60 ^{o}C with 85 % recirculated air. The temperature should not be set too high, otherwise caramelisation of the tissue will affect the dry matter content. The cores are left in the drying oven for at least 48 hours. The cores should be allowed to cool for one hour after removal from the oven; dry cool cores should snap when bent. The fifteen dry cores are weighed as a bulk. Both wet and dry weights should be measured to two decimal places.

The difference between the wet and dry core weight indicates the amount of water lost in the drying process. The dry matter percentage is calculated by using the formula

$$\frac{\text{Dry Weight}}{\text{Wet Weight}} \times 100.$$

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

IX. Literature

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X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1.	Species	*Brassica napus* L. var. *napobrassica* (L.) Rchb. SWEDE, RUTABAGA
2.	Applicant (Name and address)	
3.	Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Variety Type

(a) Open-pollinated variety [ ]

(b) Other (please indicate) [ ]

……..

4.2 Other information

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the state of expression which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (3)	**Leaf: type**		
	entire	Niko	1[ ]
	lobed	Magres, Jaune à Collet Rouge	9[ ]
5.2 (12)	**Root: predominant color of skin above soil**		
	green	Jaune à Collet Vert, Melfort, Seefelder	1[ ]
	bronze	Harrietfield	2[ ]
	reddish purple	Angus, Jaune à Collet Rouge, Kenmore	3[ ]
5.3 (13)	**Root: anthocyanin coloration of skin above soil**		
	absent	Seefelder	1[ ]
	present	Jaune à Collet Rouge, Ruta Otofte	9[ ]

	Characteristics	Example Varieties	Note
5.4.1 (14.1)	**Only varieties with green or bronze skin color** **Root: intensity of anthocyanin coloration of skin above soil**		
	weak	Melfort	3[ ]
	medium	Angus	5[ ]
	strong	Kenmore	7[ ]
5.4.2 (14.2)	**Only varieties with reddish purple skin color** **Root: intensity of anthocyanin coloration of skin above soil**		
	weak	Champion	3[ ]
	medium	Doon Major	5[ ]
	strong	Ruby	7[ ]
5.5 (16)	**Root: shape in longitudinal section**		
	transverse elliptic	Acme, Seefelder	1[ ]
	circular	Jaune à Collet Vert, Ruby	2[ ]
	obovate	Kenmore	3[ ]
	square	Doon Major	4[ ]
	oblong	Blanc Hors Terre	5[ ]
5.6 (19)	**Pseudostem: length**		
	short	Melfort, Helena	3[ ]
	medium	Ruta Otofte, Sator Otofte	5[ ]
	long	Vittoria	7[ ]
5.7 (20)	**Pseudostem: anthocyanin coloration between leaf scars**		
	absent or very weak	Melfort, Merrick, Seefelder	1[ ]
	entire	Champion, Magres	2[ ]
5.8 (21)	**Root: color of flesh**		
	white	Blanc Hors Terre, Merrick	1[ ]
	yellow	Jaune à Collet Rouge, Magres	2[ ]

6. Similar varieties and differences from these varieties

Denomination of similar variety	Characteristic in which the similar variety is different [o)]	State of expression of similar variety	State of expression of candidate variety

o) In the case of identical states of expressions of both varieties, please indicate the size of the difference.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

7.2 Main use:

- Agricultural/fodder

- Vegetable
  - Fresh [ ]
  - Processing [ ]
  - Others (please specify) [ ]

7.3 Dry matter content (characteristic 27):

- low [ ]
- medium [ ]
- high [ ]

7.4 Other information

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 that question is yes, please attach a copy of such an authorization.

[End of document]