



TG/90/5(proj.)

ORIGINAL: English

DATE : May 25, 2001

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

VEGETABLE KALE

(Borecole/Curly Kale, Collards, Tree Kale)

**(*Brassica oleracea* L. convar. *acephala* (DC.) Alef.
var. *sabellica* L., var. *acephala*, DC., var. *palmifolia* DC.)**

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 oleracea* L. convar. *acephala* (DC.) Alef. var. *sabellica* L., var. *acephala* DC., and var. *palmifolia* DC.

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the seed 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:

25 g or 6250 seeds.

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, weighing or counting should be made on 20 plants or parts taken from each of 20 plants.

2. For the assessment of uniformity of single-cross hybrid varieties, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a population size of 60 plants, the maximum number of off-types allowed would be 2.

[Comment: measures for other variety types to be presented at meeting]

3. Unless otherwise indicated, all observations on the leaves should be made on fully developed leaves which show no sign of senescence.

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: anthocyanin coloration (characteristic 5)
- (b) Leaf blade: color of fully developed leaf (characteristic 8).

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:

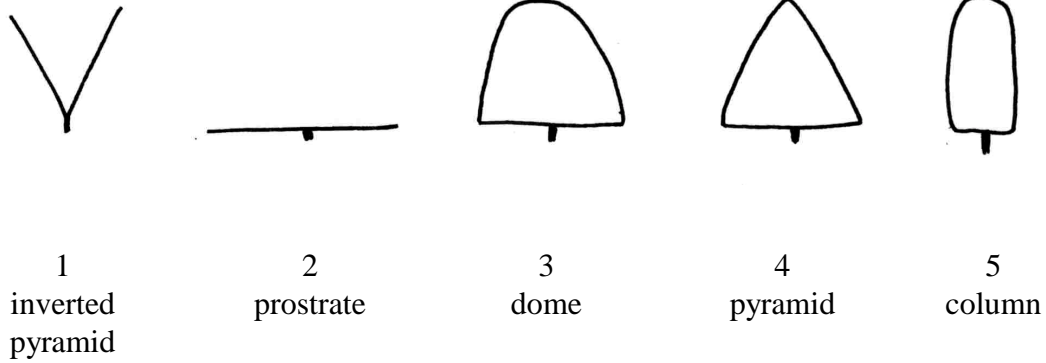
(*) Characteristics that should be used on all varieties in every growing cycle over which the examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.

(+) 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.

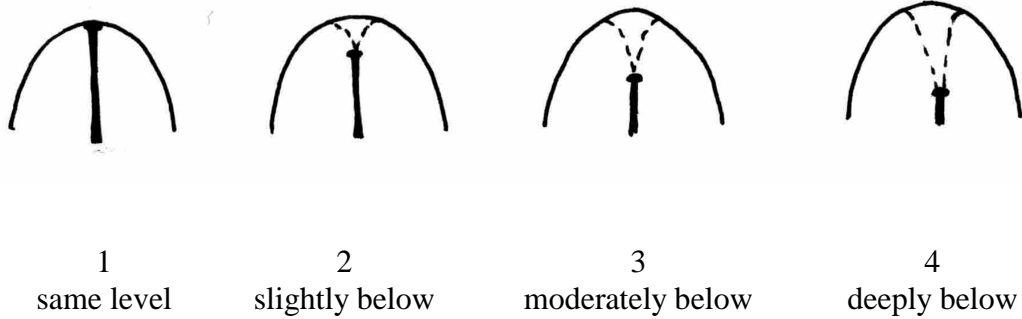
Ad/Add./Zu 3

Plant: shape: fully grown plants prior to senescence

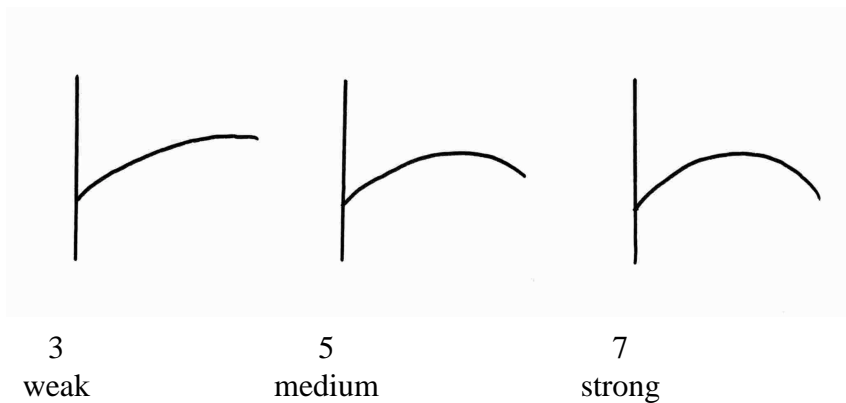


Ad/Add./Zu 4

Plant: position of growing point in relation to the top of the plant



Ad. 13: Leaf blade: curvature of midrib



Ad. 15: Leaf blade: density of “curling” (on leaves at middle of plant)



1 very weak



3 weak



5 medium

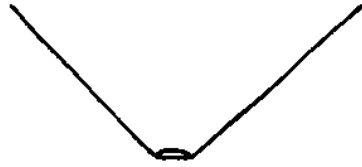


7 strong

Ad. 16: Leaf blade: folding in cross section



3
weak



5
medium



7
strong

Key for growth stage (Growth key):

00	dry seed
10	germination
15	fully opened cotyledons
20	early growth of first true leaf
25	early growth of second true leaf
30	first true leaf fully developed
40	second true leaf fully developed
50	third true leaf fully developed
60	fourth true leaf fully developed
100	new leaves developing rapidly
110	early stem formation
140	plant developing mature shape
160	lower leaves becoming coarse and large
180	middle leaves well developed, but not too coarse
200	stem fully developed becoming woody
220	plant fully developed with mature shape
240	lower leaves beginning to senesce
260	leaves at lower and middle part of plant senescing
280	very slow development of new leaves
400	initiation of flowering

X. Literature

IBPGR, 1990: Descriptors of *Brassica* and *Raphanus*, International Board for Plant Genetic Resources, Rome.

Kaloo, G. and Bergh, B.O., 1993: Genetic Improvement of Vegetable Crops, 11 Kale, 187-190, Pergamon Press, New York.

Langer, R.H.M., and Hill, G.D., 1982: Agricultural Plants 8, Cruciferae, 165-183, Cambridge University Press, Cambridge.

Lustinec, J., 1988: III. 11 Kale (*Brassica oleracea* L. var. *acephala*, *medullosa*, *ramosa*, *sabellica*), 530-547, in: *Biotechnology in Agriculture and Forestry* 6. Ed: Y.P.S.Bajaj, Springer-Verlag Berlin.

Nieuwhof, M., 1969: Cole Crops: Botany, Cultivation and Utilisation, Leonard Hill, London.

Tsunoda, S., Hinata, K. and Gomez-Campo, C., 1980: *Brassica* Crops and Wild Allies, Biology and Breeding, Japan Scientific Press, Tokyo.

X. Technical Questionnaire

	<p>Reference Number (not to be filled in by the applicant)</p>
<p style="text-align: center;">TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>	
<p>1. Species: <i>Brassica oleracea</i> L. convar. <i>acephala</i> (DC.) Alef. var. <i>sabellica</i> L., var. <i>acephala</i> DC., var. <i>palmifolia</i> DC.</p> <p style="text-align: center;">VEGETABLE KALE Borecole/Curly Kale, Collards, Tree Kale</p>	
<p>2. Applicant (Name and address)</p>	
<p>3. Proposed denomination or breeder's reference</p>	

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

4.1 Origin and breeding method

- | | |
|-----------------------------|-----|
| (a) Open-pollinated variety | [] |
| (b) Single hybrid | [] |
| (c) Three-way hybrid | [] |
| (d) Other (indicate type) | [] |

.....

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 Plant height (1)		
short	Niedriger grüner krauser	3[]
medium	Frosty, Hammer	5[]
tall	Westlandse Herfst	7[]
5.2 Plant: shape (fully developed plants) (3)		
inverted pyramid	Lerchenzungen	1[]
flat	Kobolt, (Lav Kruset)	2[]
dome	Fribor	3[]
pyramid	Moosbor	4[]
column	Arsis, Westlandse Herfst	5[]
5.3 Leaf: anthocyanin coloration (5)		
absent	Lerchenzungen, Pentland Brig	1[]
present	Garna Red	9[]
5.4 Leaf blade: color of <u>fully developed</u> leaf (9)		
yellow green	Hammer	1[]
green	Frosty	2[]
grey green	Lerchenzungen	3[]
blue green	Vates	4[]
blueish	Nero di Toscana	5[]
red or purple	Garna Red	6[]

Characteristics	Example Varieties	Note
5.5 Leaf blade: shape (11)		
very narrow elliptic	Lerchenzungen	1[]
very narrow elliptic to narrow elliptic	Kobolt	2[]
Narrow elliptic	Hammer	3[]
Narrow elliptic to elliptic	Frosty, Halbhoher grüner krauser	4[]
Elliptic	Westlandse Herfst	5[]
5.6 Leaf blade: length (12)		
short	Vates	3[]
medium	Spurt	5[]
long	Lerchenzungen	7[]
5.7 Leaf blade: width (13)		
narrow	Vates	3[]
medium	Spurt	5[]
broad	Westlandse Herfst	7[]
5.8 Leaf blade: density of “curling” (on leaves at middle of plant) (15)		
Absent or very low	Cottagers	1[]
low	Pentland Brig, Garna Red	2[]
medium	Dwarf Green Curled	3[]
high	Halbhoher grüner krauser Westlandse Herfst	4[]
5.9 Petiole: attitude at middle of plant (17)		
erect	Arsis	1[]
semi-erect	Vates	2[]
horizontal	Kobolt	3[]

6. Similar varieties and differences between 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
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^{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 Type of material:

Borecole/Curly Kale []
Collard []
Palm Tree Kale []

7.3 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]