Calibration book

Cichorium endivia L.

Endive

Naktuinbouw calibration book

Cichorium endivia L.

endive

Version 1

Introduction

In front of you, you find the calibration book for endive. This book may be used as guidance for the completion of application forms, the describing of varieties or the understanding of variety descriptions. This book can not replace the skill needed to make a variety description, but may serve as support.

Sources used
The basis for this book is the CPVO protocol CPVO-TP/118/2 which in turn is based upon UPOV Guideline TG/118/4. Please also use these sources for reference when using this calibration book. The application of this calibration book is based on the general UPOV principles on the definitions and use of characteristics of variety descriptions (UPOV TG/1/3).

Application methodology
The UPOV system is based on the expression of characteristics that are related to the expression values of example varieties. In the calibration book you find two types of characteristics; visually assessed characteristics and measured characteristics.
The value of the visually assessed characteristics can be compared with the visual value of the expression of example varieties. In the calibration book you may find drawings or pictures to assist in the decision on the applicable expression. For measured characteristics this is more complicated as in many cases the value of the measurements is depending on the (climatical) conditions of the trials. The use of example varieties in these cases is indispensable. The same applies for those visually assessed characteristics that are prone to influence by climate (e.g. anthocyanin coloration). In this calibration book these example varieties are only included for the characteristics that appear in the Technical Questionnaire. Others are not included as many prefer their own set of example varieties, but may be found in the relevant CPVO protocol.

Website
The CPVO and UPOV documents mentioned above can be found on the Naktuinbouw website (*http://www.naktuinbouw.nl/onderwerp/kalibratieboeken*). On this website you can also find announcements of possible modifications of the published calibration books.

Helpdesk
For possible remarks, suggestions and questions on the calibration books and the website, you may contact Naktuinbouw at our email address: kalibratieboek@naktuinbouw.nl

Contents

1 Plant: botanical type

Grouping characteristic: yes.

Type of characteristic: (**QN –** Quantitative characteristics CPVO);   QL- Qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. Calibrate using example varieties and the CPVO explanation.

Notes, states of expression and example varieties:
1: plain type   *Cichorium endivia* var. *latifolia*
2: intermediate type
3: cut type   *Cichorium endivia* var. *crispa*

CPVO explanation:

(1) <u>Plain type</u>

Plain type (*C. endivia* var. *latifolia*) : Endives of the plain type are characterized by their full foliage with serrated margins. They differ from those of the cut type in that their leaves are broader, undulating or curled-up with marginal dentation and incurved towards the heart of the plant.

(2) <u>Intermediate type</u>

Intermediate type: the leaves are of the size of the plain type with the outline of a semi-fine cut type.

(3) <u>Cut type</u>

Cut type (*C. endivia* var.*crispa*) : Endives of the cut type are characterized by their numerous leaves disposed in a rosette shape, deeply indented and creased, smooth and more or less serrated.

1 Plant: botanical type

1: plain type

2: intermediate type

1 Plant: botanical type

3: cut type

1 Plant: botanical type

2 <u>Plain type varieties only:</u> Plant: sub-type

Grouping characteristic: yes.

Type of characteristic: **QL**–Qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. Calibrate using example varieties and the CPVO explanation.

Notes, states of expression and example varieties:
1: Grosse bouclée
2: Á coeur plein
3: Géante maraîchère
4: Cornet

CPVO explanation:

(1) <u>Grosse bouclée</u>

Short, broad foliage; large, full heart with white, tightly-curled heart leaves.

(2): <u>Á coeur plein</u>

Somewhat flattened shape because the partly incurved inner leaves tend to cover the heart, thus forming quite a noticeable ball low down; the ball is broad, with crinkly leaves.

(3): <u>Géante maraîchère</u>

Very voluminous variety of erect growth habit, abundant blond green foliage and a tightly-closed heart.

(4) <u>Cornet</u>

Compared with the other plain-type endives this one has fewer but much more ample leaves, almost as broad as they are long, the margins broken up into numerous elongated serrations. The leaf, initially folded in the centre of the plant, spreads outwards as it grows, like the bell of a trumpet, often forming a sort of cap that continues for some time to envelop the younger, inner leaves, so forming a true heart.

2 <u>Plain type varieties only:</u> Plant: sub-type

2 <u>Plain type varieties only:</u> Plant: sub-type

1: Grosse bouclée

2: Á coeur plein

2 <u>Plain type varieties only:</u> Plant: sub-type

3: Géante maraîchère

4: Cornet

2 <u>Plain type varieties only:</u> Plant: sub-type

3 <u>Non-plain type varieties only:</u> **Plant: sub-type**

Grouping characteristic: yes.

Type of characteristic: (**QL**–Qualitative characteristic CPVO) PQ – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. Calibrate using example varieties and the CPVO explanation.

Notes, states of expression and example varieties:
1: Wallonne
2: Louviers
3: D'été à coeur jaune
4: other types (including intermediate types between cut and plain types)

CPVO explanation:

(1) <u>Wallonne</u>

This type is characterized by its long, broad leaves cut into symmetrical lobes, with finely indented, curly margins and relatively narrow ribs.

(2) <u>Louviers</u>

This type is characterized by very fine ribs, very finely and deeply indented, not very curly foliage and a tight heart.

(3) <u>D'été à coeur jaune</u>

This type is characterized by its broad white and fleshy ribs and semi-fine, spreading cut foliage, medium-indented, and quite a tight yellow heart.

(4) <u>other types (including intermediate types between cut and plain types)</u>
Other types may include, apart from the intermediate types between cut and plain types, also cut types with a different plant and leaf structure than sub-type 1, 2 and 3.

3 <u>Non-plain type varieties only:</u> **Plant: sub-type**

3 Non-plain type varieties only: Plant: sub-type
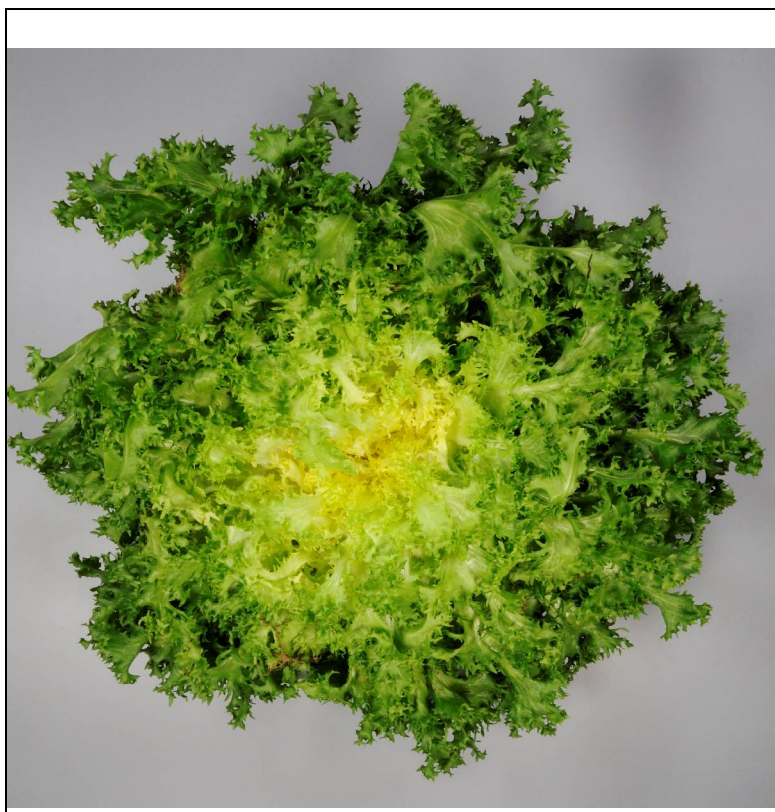
1: Wallonne

2: Louviers

3 Non-plain type varieties only: Plant: sub-type

3 D'été à coeur jaune

4: other type (between plain and cut)

3 Non-plain type varieties only: Plant: sub-type

4 Plant: diameter

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. Calibrate using example varieties.

Notes and states of expression:
1: very small
2: very small to small
3: small
4: small to medium
5: medium
6: medium to large
7: large
8: large to very large
9: very large

4 Plant: diameter

1: very small

3: small

5: medium Fijn Krul Groen

7: large

9: very large Wallonne

5 Plant: growth habit

Grouping characteristic: no.

Type of characteristic: QN – Quantitative characteristic.

Type of observation: VG – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on the leaves excluding the outer and centre leaves.

Method of observation: visual observation. Calibrate using example varieties.

Notes and states of expression:
1: erect
2: erect to semi-erect
3: semi-erect
4: semi-erect to horizontal
5: horizontal

1: erect   3: semi-erect

5: horizontal

6 Heart: shape in longitudinal section

Grouping characteristic: yes.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.
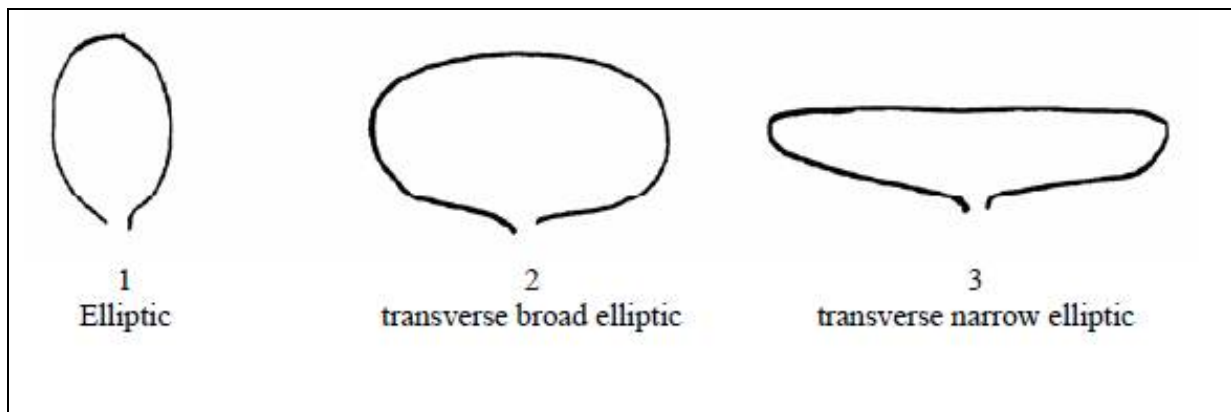
Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. Cut the plant as shown on the pictures. The heart is formed by the centre leaves which do not have green chlorophyll colouration under the influence of light yet. It is important not to use artificial bleaching measures like covering of the heart during the growth of the plant. Calibrate using example varieties and explanatory drawings and photos.

Notes, states of expression and example varieties:
1: elliptic   Cornet de la Loire
2: transverse broad elliptic   D'été à coeur jaune
3: transverse narrow elliptic   Argentée Mirabel, De Louviers, Golda

CPVO explanation:

| 1 | 2 | 3 |
| Elliptic | transverse broad elliptic | transverse narrow elliptic |

6 Heart: shape in longitudinal section

1: elliptic
Cornet de la Loire

2: transverse broad elliptic
Blonde à coeur jaune

3: transverse narrow elliptic

6 Heart: shape in longitudinal section

7 Heart: colour

Grouping characteristic: no.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity.

Method of observation: Visual observation. The heart is formed by the centre leaves which do not have green chlorophyll colouration under the influence of light yet. It is important not to use artificial bleaching measures like covering of the heart during the growth of the plant. Calibrate using example varieties and explanatory photos.

Notes, states of expression and example varieties:
1: yellowish green   Blonde à coeur plein, Toujours Blanche
2: green   Reine d'Hiver

1: yellowish green   2: green

8 Heart: intensity of green colour

Grouping characteristic: no.

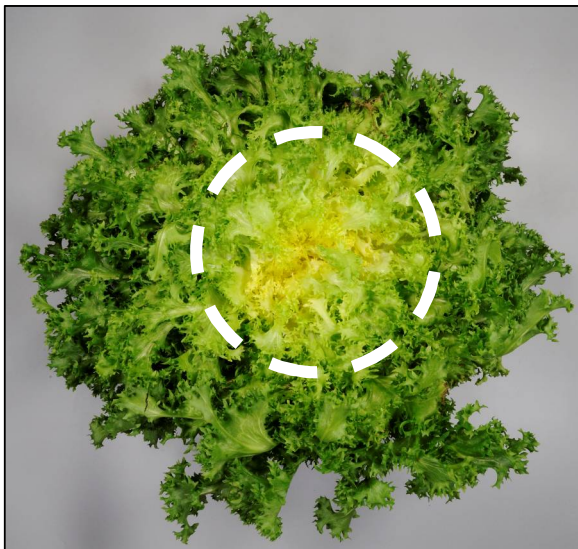**Type of characteristic**: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

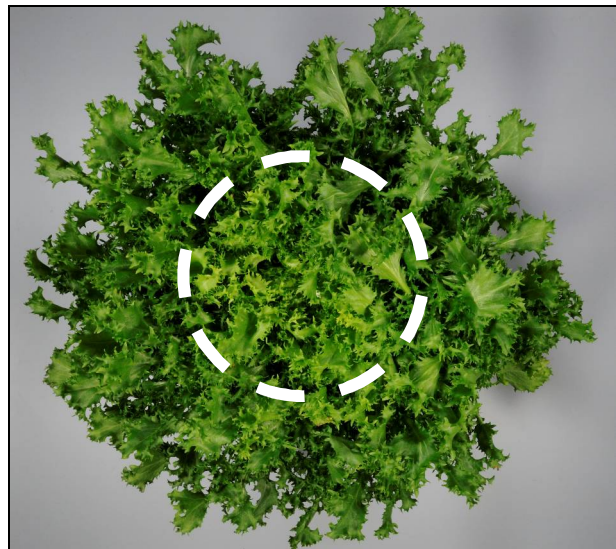**Stage of observation:** Just before harvest maturity.

Method of observation: Visual observation. Observe the surface of the heart, not the inner. It is important not to use artificial bleaching measures like covering of the heart during the growth of the plant. Calibrate using example varieties.

Notes and states of expression:
1: very light
2: very light to light
3: light
4: light to medium
5: medium
6: medium to dark
7: dark
8: dark to very dark
9: very dark

9 Leaf: attitude

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using example varieties.

Notes and states of expression:
3: erect
4: erect to semi-erect
5: semi-erect
6: semi-erect to horizontal
7: horizontal

10 Leaf: incurving of distal part

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using the explanatory drawings and example varieties.

Notes and states of expression:
1: very weak
2: very weak to weak
3: weak
4: weak to medium
5: medium
6: medium to strong
7: strong
8: strong to very strong
9: very strong

CPVO explanation:

| 3: weak | 5: medium | 7: strong |

11 Leaf: length

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: MS/VG – Choice between
- Calculated average of the measurement of 20 plants or parts of plants and
- Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using the explanatory photos and example varieties.

Notes and states of expression:
1: very short
2: very short to short
3: short
4: short to medium
5: medium
6: medium to long
7: long
8: long to very long
9: very long

3: short   5: medium   7: long   9: very long

12 Leaf: maximum width

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: MS/VG – Choice between
- Calculated average of the measurement of 20 plants or parts of plants and
- Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves. The maximum width is where the leaf is at its broadest. To facilitate this observation, try to flatten the leaf.

Method of observation: Visual observation. Calibrate using the explanatory photos and example varieties.

Notes and states of expression:
1: very narrow
2: very narrow to narrow
3: narrow
4: narrow to medium
5: medium
6: medium to broad
7: broad
8: broad to very broad
9: very broad

12 Leaf: maximum width

Plain type varieties

3: narrow	5: medium	7: broad

Cut type varieties

5: medium Wallonne   7: broad D'été à coeur jaune

13 <u>Plain type varieties only:</u> Leaf: shape

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using the explanatory photos and example varieties.

Notes and states of expression:
1: very narrow obovate
2: very narrow obovate to narrow obovate
3: narrow obovate
4: narrow obovate to obovate
5: obovate
6: obovate to broad obovate
7: broad obovate
8: broad obovate to very broad obovate
9: very broad obovate

3: narrow obovate   5: obovate   7: broad obovate

14 Leaf: colour

Grouping characteristic: no.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using the explanatory photos and example varieties.

Notes, states of expression and example varieties:
1: yellowish green   Blonde à coeur plein, Toujours blanche
2: green   Batavia Améliorée, D'été d'Anjou, De Namur
3: greyish green   De Louviers

1: yellowish green   2: green   3: greyish green

15 Leaf: intensity of green colour

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation.

Notes and states of expression:
1: very light
2: very light to light
3: light
4: light to medium
5: medium
6: medium to dark
7: dark
8: dark to very dark
9: very dark

16 <u>Non-plain type varieties only:</u> Leaf: distance between lobes

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Be aware that the lobes are not formed by the dentate incisions of the margin but by the large incisions between veins running to the main vein. Calibrate using the explanatory photos and example varieties.

Notes and states of expression:
1: very short
2: very short to short
3: short
4: short to medium
5: medium
6: medium to long
7: long
8: long to very long
9: very long

3: short Wallonne   5: medium De Meaux   7: long De Ruffec

17 Leaf: creasing

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. The creasing of the leaf is about whether the whole surface of the leaf (other than only the margin of the leaf) is simulating. The creasing tends to run parallel to the veins. Calibrate using the explanatory photos and example varieties.

Notes and states of expression:
1: very weak
2: very weak to weak
3: weak
4: weak to medium
5: medium
6: medium to strong
7: strong
8: strong to very strong
9: very strong

17 Leaf: creasing

Plain type varieties

Cut type varieties

| 3: weak | 5: medium | 7: strong |

18 Plain type varieties only: Leaf: glossiness

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using example varieties.

Notes and states of expression:
1: very weak
2: very weak to weak
3: weak
4: weak to medium
5: medium
6: medium to strong
7: strong
8: strong to very strong
9: very strong

19 <u>Non-plain type varieties only</u>: Leaf: ratio length of midrib without lamina/total length of leaf

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **MS** – Calculated average of the measurement of 20 plants or parts of plants.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Note that the lamina is formed by small lobes of mesophyll. Calibrate using the explanatory drawings and photos and example varieties.
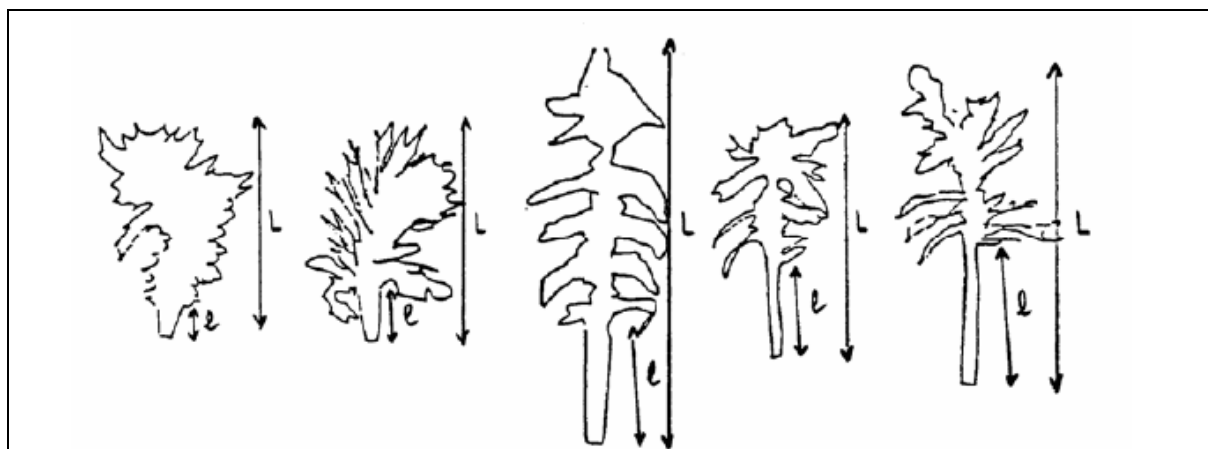
Notes and states of expression:
1: very small
2: very small to small
3: small
4: small to medium
5: medium
6: medium to large
7: large
8: large to very large
9: very large

| 3: small | 5: medium | 7: large |

19 <u>Non-plain type varieties only</u>: Leaf: ratio length of midrib without lamina/total length of leaf

CPVO explanation:

20 Leaf: width of midrib at base

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: MS/VG – Choice between
- Calculated average of the measurement of 20 plants or parts of plants and
- Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.
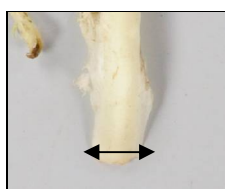
Notes and states of expression:
1: very narrow
2: very narrow to narrow
3: narrow
4: narrow to medium
5: medium
6: medium to broad
7: broad
8: broad to very broad
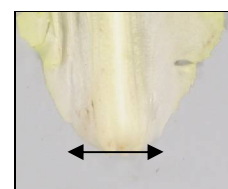9: very broad

20 Leaf: width of midrib at base

3: narrow   5: medium D'été à coeur jaune   7: broad Blonde à coeur plein

21 <u>Non-plain type varieties only:</u> Leaf: colour of midrib at base

Grouping characteristic: no.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Just before harvest maturity on leaves excluding the outer and centre leaves.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes and states of expression:
1: white
2: pink

1: white D'été à coeur jaune   2: pink De Meaux

21 <u>Non-plain type varieties only:</u> Leaf: colour of midrib at base

22 Stem: height

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: MS/VG – Choice between
- Calculated average of the measurement of 20 plants or parts of plants and
- Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: On a flowering stem, when the first flowers are open. It is important to stick to this stage for the observation, and not to measure all the varieties at the same time, whether flowering or not.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes and states of expression:
1: very short
2: very short to short
3: short
4: short to medium
5: medium
6: medium to tall
7: tall
8: tall to very tall
9: very tall

3: short

5: medium
D'été à coeur jaune

7: tall
Cornet de la Loire

23 Stem: fasciation

Grouping characteristic: no.

Type of characteristic: **QL-** Qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: On a flowering stem, when the first flowers are open. It is important to stick to this stage for the observation, and not to observe all the varieties at the same time, whether flowering or not.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes and states of expression:
1: absent
9: present

1: absent

9: present

24 Stem: attitude of branches

Grouping characteristic: no.

Type of characteristic: **QN-** Quantitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: On a flowering stem, when the first flowers are open. It is important to stick to this stage for the observation, and not to observe all the varieties at the same time, whether flowering or not.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes and states of expression:
1: erect
2: erect to semi-erect
3: semi-erect
4: semi-erect to horizontal
5: horizontal

1: erect   3: semi-erect

25 Plain type varieties only: Stem: shape of stipules

Grouping characteristic: no.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: On a flowering stem. Observe stipules at the same position on the flowering stem.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes and states of expression:
1: elliptic
2: broad elliptic
3: circular

| 1: elliptic | 2: broad elliptic | 3: circular |

26 Flower: colour

Grouping characteristic: yes.

Type of characteristic: **PQ** – Pseudo-qualitative characteristic.

Type of observation: **VG** – Single visual assessment of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: On a flowering stem, when the first flowers are open. It is important to stick to this stage for the observation. Observe the flowers that have just opened, so that they are fresh. Observation of the colour can also be done in a room with northern daylight; this might be easier for observing the difference between blue and violet blue. Include in all cases example varieties for blue and violet blue in the trial.

Method of observation: Visual observation. Calibrate using example varieties and explanatory photos.

Notes, states of expression and example varieties:
1: white   De Louviers, Pommant seule
2: pink   Lisuna, Pinkstar, Rosabelle
3: blue   De Meaux, De Namur, Grosse bouclée 2
4: violet blue   Alaska, Ariga, Sally, Wallonne

1: white   2: pink   3: blue   4: violet blue

27 Time of harvest maturity

Grouping characteristic: no.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **MG** – Single measurement of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: At harvest maturity.

Method of observation: Visual observation. Calibrate using example varieties.

Notes and states of expression:
1: very early
2: very early to early
3: early
4: early to medium
5: medium
6: medium to late
7: late
8: late to very late
9: very late

28 Time of bolting

Grouping characteristic: yes.

Type of characteristic: **QN** – Quantitative characteristic.

Type of observation: **MG** – Single measurement of a group of plants or parts of plants; in practice a single assessment of an average single plant or part of plant.

Stage of observation: Observation after the vegetative phase. The time of bolting of a plant is when the flowering stem appears in the middle of the leaf rosette through stretching of the internodes.

Method of observation: Visual observation. Conduct a separate trial to asses this characteristic when developing of flower stems will be stimulated by e.g. long day and/or hot weather. Walk 3 times a week along the trial to not miss the moment of occurring of flower stems. Write down the amount of bolting plants. The time of bolting is the moment when all plants begin to bolt. Calibrate using example varieties.

Notes, states of expression and example varieties:
1: very early   Isadora, Noveli
2: very early to early
3: early   De Meaux, Pommant seule
4: early to medium
5: medium   Elody, Sally
6: medium to late
7: late   Blonde à coeur plain, De Namur
8: late to very late
9: very late   Excel, Foxie, Snoopie

Notes

Notes