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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

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TECHNICAL WORKING PARTY FOR VEGETABLES

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REVISION OF DOCUMENT TGP/7: INDICATION OF GROWTH STAGE IN TEST GUIDELINES

Document prepared by the Office of the Union

1. The purpose of this document is to consider guidance on indicating the growth stage at which to observe characteristics in the Test Guidelines for a future revision of document TGP/7: "Development of Test Guidelines".

2. The following abbreviations are used in this document:

TC:	Technical Committee
TC-EDC:	Enlarged Editorial Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWPs:	Technical Working Parties
TWV:	Technical Working Party for Vegetables

3. The structure of this document is as follows:

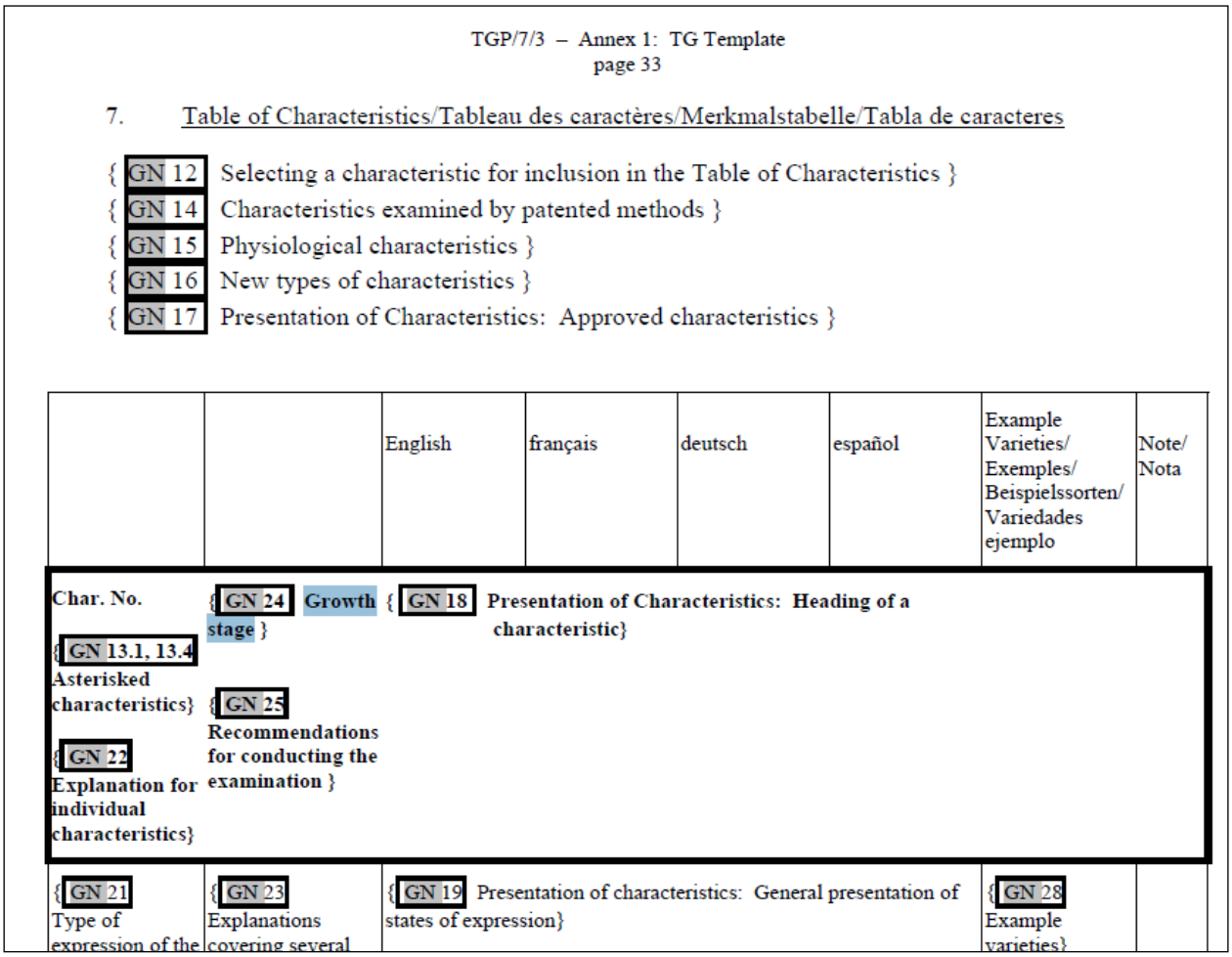
BACKGROUND

4. The Technical Committee (TC), at its forty-ninth session held in Geneva from March 18 to 20, 2013, agreed that clarification should be provided in a future revision of document TGP/7 with regard to the inclusion of growth stage keys in Chapter 8 of the Test Guidelines and requested the Office of the Union to prepare draft guidance for consideration by the TWPs at their sessions in 2013 (see document TC/49/41 "Report on the Conclusions", paragraph 83).

EXISTING GUIDANCE IN DOCUMENT TGP/7

TG Template

5. The TG Template and associated Guidance Note (GN24) provide the following guidance for indicating the growth stage for the observation of characteristics in the Test Guidelines:



TGP/7/3 – Annex 1: TG Template
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7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

{ GN 12 Selecting a characteristic for inclusion in the Table of Characteristics }
{ GN 14 Characteristics examined by patented methods }
{ GN 15 Physiological characteristics }
{ GN 16 New types of characteristics }
{ GN 17 Presentation of Characteristics: Approved characteristics }

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
Char. No. {GN 13.1, 13.4 Asterisked characteristics} {GN 22 Explanation for individual characteristics}	**{GN 24 Growth stage }** {GN 25 Recommendations for conducting the examination }	**{GN 18 Presentation of Characteristics: Heading of a characteristic}**					
{GN 21 Type of expression of the	{GN 23 Explanations covering several	{GN 19 Presentation of characteristics: General presentation of states of expression}				{GN 28 Example varieties}	

GN 24 (TG Template: Chapter 7: column 2, header row 1) – Growth stage

In some Test Guidelines, the growth stage at which the examination of the characteristic should be done is provided here. In such cases, the stages of development denoted by each number are described in a section within Chapter 8, according to ASW 4(a).

ASW 4 (TG Template: Chapter 3.3) – Conditions for conducting the examination

Information for conducting the examination of particular characteristics

(a) Stage of development for the assessment

"The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8 […]."

GN 23

6. Guidance Note GN 23 for drafters of Test Guidelines: "Explanations covering several characteristics", also states as follows:

> GN 23 (TG Template: Chapter 7: column 2, state of expression row 1) – Explanations covering several characteristics
>
> In cases where an explanation applies to several characteristics (e.g. part of the plant on which to observe particular characteristics, illustration of plant parts, etc.), particularly for characteristics that are not immediately consecutive in the Table of Characteristics, a note is placed in column 2 and the explanation provided in Chapter 8.1, according to ASW 11. In the case of indications of the stage of observation, those indications should be made according to GN 24 "Growth stage".

Chapter 3.3 and GN 9

7. The TG Template and Guidance Note (GN 9) provide further guidance as follows:

> TGP/7/3 – Annex 1: TG Template
> page 28
>
> *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".
>
> *3.3 Conditions for Conducting the Examination*
>
> [3.3.1] 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.
>
> { **ASW 4** (Chapter 3.3) – conditions for conducting the examination }
>
> { GN 9 (Chapter 3.3) – growth stage key}

> GN 9 (TG Template: Chapter 3.3) – Growth stage key
>
> In cases where it is appropriate to provide a growth stage key for the observation of characteristics, the following is a useful guide:
>
> "Growth stages of mono-and dicotyledonous plants - BBCH Monograph"
> (Federal Biological Research Centre for Agriculture and Forestry)
> ISBN Number: 3-8263-3152-4
>
> *http://www.bba.de/veroeff/bbch/bbcheng.pdf*

8. The Annex to this document provides examples of growth stage reference in existing Test Guidelines as follows:

- TG/7/10: Pea
- TG/4/8: Ryegrass
- TG/276/1: Hemp
- TG/PINEAP(proj.12): Pineapple

PROPOSALS FOR INDICATING GROWTH STAGE AT WHICH TO OBSERVE CHARACTERISTICS IN THE TEST GUIDELINES

9. The guidance in document TGP/7 indicating the growth stage at which to observe characteristics in the Test Guidelines clarifies that such indication should be provided in the relevant cell of the Table of Characteristics (see paragraph 5) and accompanied by an explanation of the growth stage key in a separate subchapter of Chapter 8 of the Test Guidelines.

10. The TWV is invited to consider whether there is a need to amend the existing guidance in document TGP/7 with regard to the indication of growth stage at which to observe characteristics in the Test Guidelines.

[Annex follows]

ANNEX

EXAMPLES OF INDICATIONS OF GROWTH STAGE AT WHICH TO OBSERVE CHARACTERISTICS IN EXISTING TEST GUIDELINES

EXTRACT FROM TG/7/10: PEA

3.3 Conditions for Conducting the Examination

3.3.1 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.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described at the end of Chapter 8.

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (+)	**200-240 MS/ VG**	**Leaf: maximum number of leaflets**	**Feuille : nombre maximum de folioles**	**Blatt: maximale Anzahl Blattfiedern**	**Hoja: número máximo de folíolos**		
QN		few	petit	gering	bajo	Jof	3
		medium	moyen	mittel	medio	Dark Skin Perfection, Finale	5
		many	grand	groß	alto	Ultimo	7
10.	**216-226 MS/ VG**	**Leaflet: size**	**Foliole : taille**	**Blattfieder: Größe**	**Folíolo: tamaño**		
QN	**(a)**	very small	très petite	sehr klein	muy pequeño	Payette	1
		small	petite	klein	pequeño	Mini	3
		medium	moyenne	mittel	medio	Finale	5
		large	grande	groß	grande	Alderman	7
		very large	très grande	sehr groß	muy grande	Mammoth Melting Sugar	9
11.	**216-226 MS/ VG**	**Leaflet: length**	**Foliole: longueur**	**Blattfieder: Länge**	**Folíolo: longitud**		
QN	**(a)**	short	courte	kurz	corto	Eagle, Polar	3

KEY FOR THE GROWTH STAGES
CLE POUR LES STADES DE CROISSANCE
SCHLÜSSEL FÜR DIE ENTWICKLUNGSSTADIEN
CLAVE PARA LOS ESTADOS DE DESARROLLO

Key Clé Schlüssel Clave	General Description	Description générale	Allgemeine Beschreibung	Descripción general
0	Germination	Germination	Keimung	Germinación
00	Dry seed	Graine sèche	Trockenkorn	Semilla seca
10	Seedling growth	Croissance de la plantule	Wachstum des Keimlings	Desarrollo de las plántulas
16	Young seedling with first scale leaf developed	Jeune plantule avec première feuille à écailles développée	Junger Keimling mit ersten entwickelten Schuppenblättern	Plántula joven con la primera hoja escamosa desarrollada
18	Young seedling with second scale leaf developed	Jeune plantule avec deuxième feuille à écailles développée	Junger Keimling mit zweiten entwickelten Schuppenblättern	Plántula joven con la segunda hoja escamosa desarrollada
20	First pair of stipules at the third node fully opened	Première paire de stipules au niveau du troisième noeud complètement ouverte	Erstes Paar Nebenblätter am dritten Knoten voll geöffnet	Primer par de estípulas en el nivel del tercer nudo completamente abiertas
22	Stipules at the fourth node fully opened	Stipules au niveau du quatrième noeud complètement ouverts	Nebenblätter am vierten Knoten voll geöffnet	Estípulas en el nivel del cuarto nudo completamente abiertas
25	Stipules at the fifth node fully opened	Stipules au niveau du cinquième noeud complètement ouverts	Nebenblätter am fünften Knoten voll geöffnet	Estípulas en el nivel del quinto nudo completamente abiertas

Key Clé Schlüssel Clave	General Description	Description générale	Allgemeine Beschreibung	Descripción general
210	Emergence of first flower bud from stipules	Apparition du premier bourgeon à fleurs hors des stipules	Erscheinen der ersten Blütenknospe aus den Nebenblättern	Aparición de la primera yema floral fuera de las hojas escamosas
212	Emergence of standards from the calyx	Apparition des étendards hors du calice	Erscheinen der Fahne aus dem Kelch	Aparición de los estandartes fuera del cáliz
214	Opening of the standards and emergence of the wings	Ouverture des étendards et apparition des ailes	Oeffnen der Fahne und Erscheinen der Flügel	Apertura de los estandartes y aparición de las alas
216	Slight opening of the wings to show the keel	Légère ouverture des ailes découvrant la carène	Leichtes Oeffnen der Flügel und Erscheinen des Kieles	Ligera apertura de las alas para mostrar la quilla
218	Standards usually fully opened	Etendards généralement complètement ouverts	Fahnen normalerweise voll geöffnet	Estandartes normalmente abiertos por completo
220	Standards beginning to crumple at the margins	Etendards commençant à se friper sur les bords	Fahnen beginnen am Rand zu kräuseln	Los estandartes comienzan a arrugarse en los bordes
222	Standards and wings showing signs of withering	Etendards et ailes présentant des signes de flétrissure	Fahnen und Flügel weisen Zeichen des Welkens auf	Los estandartes y las alas presentan signos de marchitez
224	Emergence of the first flat pod	Apparition de la première gousse aplatie	Erscheinen der ersten flachen Hülse	Aparición de la primera vaina plana

EXTRACT FROM TG/4/8: RYEGRASS

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described at the end of Chapter 8.

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
4.	**20-29 VG B**	**Leaf: width (at vegetative stage)**	**Feuille: largeur (au stade végétatif)**	**Blatt: Breite (im vegetativen Stadium)**	**Hoja: anchura (en estado vegetativo)**		
QN		very narrow	très étroite	sehr schmal	muy estrecha		1
		narrow	étroite	schmal	estrecha	Aragon (Lp)	3
		medium	moyenne	mittel	media	Mondial (Lp)	5
		broad	large	breit	ancha	Baroldi (Lmw), Veritas (Lp)	7
		very broad	très large	sehr breit	muy ancha	Lipo (Lmi), Promenade (Lmw)	9

8.3 Growth stages for grasses

All characteristics should be recorded at the appropriate time for the plant concerned. Growth stages of grasses are indicated by decimal codes which are derived from the decimal code for the growth stages of cereals (Zadoks, et al., 1974). This decimal code is in close conformity with the BBCH-code (Meier, 1997).

Seedling growth (seedling: one shoot)

DC 10 First leaf through coleoptile
DC 15 Five leaves unfolded
DC 19 Nine or more leaves unfolded

Tillering

DC 20 Main shoot only (beginning of tillering)
DC 23 Main shoot and 3 tillers
DC 25 Main shoot and 5 tillers
DC 29 Main shoot and 9 or more tillers

EXTRACT FROM TG/276/1: HEMP

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (+)	**0003 VG**	**Cotyledon: shape**	**Cotylédon : forme**	**Keimblatt: Form**	**Cotiledón: forma**		
QN	**C**	narrow obovate	obovale étroit	schmal verkehrt eiförmig	oboval estrecha	Fibrimon	1
		medium obovate	obovale moyen	mittel verkehrt eiförmig	oboval media	Epsilon 68	2
		broad obovate	obovale large	breit verkehrt eiförmig	oboval ancha	Futura 75	3
2.	**0003 VG**	**Cotyledon: color**	**Cotylédon : couleur**	**Keimblatt: Farbe**	**Cotiledón: color**		
PQ	**C**	yellow	jaune	gelb	amarillo	Chamaeleon	1
		light green	vert clair	hellgrün	verde claro	Fedora 17	2
		medium green	vert moyen	mittelgrün	verde medio	Ferimon	3
		dark green	vert foncé	dunkelgrün	verde oscuro	Dioica 88	4

Principal growth stages

Four principal stages describe the life cycle of a plant and are coded by their first digit of the four-digit code.

First-digit of code	Definition
0	Germination and emergence
1	Vegetative stage
2	Flowering and seed formation
3	Senescence

Secondary growth stages

The secondary growth stages are described by the second digit, which indicates the sex of the plant, the third and fourth digits indicating the developmental stage of the plant.

Code	Definition	Remarks
Germination and emergence		
0000	Dry seed	
0003	Cotyledons unfolded	
Vegetative stage refers to main stem. Leaves are considered unfolded when leaflets are at least one cm long		
1002	1st leaf pair	1 leaflet
1004	2nd leaf pair	3 leaflets

EXTRACT FROM TG/PINEAP(proj.12): PINEAPPLE

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(*)** **(+)**	**VG** **1-T**	**Plant: growth habit**	**Plante : port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	**(a)**	upright	dressé	aufrecht	erguido	Perola	1
		semi upright	demi-dressé	halbaufrecht	semierguido	Smooth Cayenne	3
		spreading	étalé	breitwüchsig	extendido	Perolera	5
2. **(*)** **(+)**	**VG/** **MS** **1-T**	**Plant: number of leaves**	**Plante : nombre de feuilles**	**Pflanze: Anzahl der Blätter**	**Planta: número de hojas**		
QN	**(a)**	few	faible	gering	bajo	Perola	3
		medium	moyen	mittel	medio	BRS Imperial, Gold, Smooth Cayenne	5
		many	élevé	groß	alto	Gomo de Mel	7
3. **(*)** **(+)**	**VG/** **MS** **1-T**	**Leaf: length**	**Feuille : longueur**	**Blatt: Länge**	**Hoja: longitud**		
QN	**(a)**	short	petite	kurz	corta	Queen	3
		medium	moyenne	mittel	media	Smooth Cayenne	5
		long	grande	lang	larga	Aus-Carnival, Perola	7

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) (Characteristics 1 to 13) Should be observed at the time floral induction is provoked artificially (stage 1-T), which is generally about 36 to 54 weeks after planting, depending on the location and the varieties.

(b) (Characteristics 14 to 18) Observations related to flowering, inflorescence and flowers should be made on 10 inflorescences, at the time of anthesis (stage 2-A). Measurements of floral parts to be taken on 10 flowers removed at mid-anthesis.

(c) (Characteristic 19) Observations of fruits before maturity should be made on 10 fruits, 4-6 months after floral induction is provoked (immature fruit—stage 3-I), at maximum size before the fruits starts to mature.

(d) (Characteristics 20 to 48) Observations related to plant and fruit at harvest should be made in the plot on 10 plants and 10 fruits. It is considered that harvest time is the stage at which the fruit is ready for consumption (actual maturity—stage 4-M). Measures to be made on 10 fruits.

Growth stages

- 1-T: At fully vegetative growth stage, before flower emergence
- 2-A: Anthesis stage
- 3-I: Immature fruit stage, before physiologically ripe
- 4-M: Maturity stage, when physiologically ripe

[End of Annex and of document]