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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

HOP

UPOV Code: HUMUL_LUP

Humulus lupulus L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Humulus lupulus</i> L.	Hop	Houblon	Hopfen	Lúpulo

The purpose of these guidelines (“Test Guidelines”) is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES.....	3
2. MATERIAL REQUIRED.....	3
3. METHOD OF EXAMINATION.....	3
3.1 Number of Growing Cycles.....	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination	3
3.4 Test Design.....	4
3.5 Number of Plants / Parts of Plants to be Examined.....	4
3.6 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.2 Uniformity.....	5
4.3 Stability	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1 Categories of Characteristics.....	6
6.2 States of Expression and Corresponding Notes.....	6
6.3 Types of Expression	6
6.4 Example Varieties	6
6.5 Legend.....	6
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES	7
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS.....	13
8.1 Explanations covering several characteristics	13
8.2 Explanations for individual characteristics.....	13
8.3. Phenological growth stages and BBCH-identification keys of <i>Humulus lupulus</i> L. (Rossbauer et al., 1995).....	16
9. LITERATURE.....	17
10. TECHNICAL QUESTIONNAIRE.....	18

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Humulus lupulus* L.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of dormant roots.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

10 dormant roots.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 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.

3. Method of Examination

3.1 *Number of Growing Cycles*

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

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*

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.

3.3.1 *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 at the end of Chapter 8.

3.3.2 Type of observation

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 10 plants.

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 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 10 plants or parts taken from each of 10 plants.

3.6 *Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

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 Test Guidelines are familiar with the

recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 *Uniformity*

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 *Stability*

4.3.1 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.

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization 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 organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Main shoot: anthocyanin coloration (characteristic 1)
- (b) Plant: growth type (characteristic 7)
- (c) Time of picking maturity of cones (characteristic 16)
- (d) Cone: degree of opening of bracts (characteristic 19)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

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.

6.3 *Types of Expression*

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 *Example Varieties*

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3

QN Quantitative characteristic – see Chapter 6.3

PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, VG: See Chapter 3.3.2

(a)-(c) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2

37-89: See Explanations on the Table of Characteristics in Chapter 8.3

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. 37-38	Main shoot:	Tige principale:	Haupttrieb:	Rama principal:		
(*) VG	anthocyanin coloration	pigmentation anthocyanique	Anthocyanfärbung	pigmentación antociánica		
QN	(a) absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Late Cluster	1
	weak	faible	gering	débil	Willamette	3
	medium	moyenne	mittel	media	Spalter	5
	strong	forte	stark	fuerte	Northern Brewer	7
	very strong	très forte	sehr stark	muy fuerte	Wye Challenger	9
2. 37-38	Leaf: size of blade	Feuille: taille du limbe	Blatt: Größe der Spreite	Hoja: tamaño del limbo		
(*) VG						
QN	(a) small	petit	klein	pequeño	First Gold	3
	(b) medium	moyen	mittel	medio	Northern Brewer	5
	large	grand	groß	grande	Nugget	7
3. 37-38	Leaf: blistering of upper side of blade	Feuille: cloûre de la face supérieure du limbe	Blatt: Blasigkeit der Oberseite der Spreite	Hoja: abullonado del haz del limbo		
(*) VG						
QN	(a) absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	(b) weak	faible	gering	débil	Columbus	3
	medium	moyenne	mittel	medio	Perle	5
	strong	forte	stark	fuerte		7
4. 37-38	Leaf: color of upper side of blade	Feuille: couleur de la face supérieure du limbe	Blatt: Farbe der Oberseite der Spreite	Hoja: color del haz del limbo		
VG						
PQ	(a) yellow	jaune	gelb	amarillo	Diva	1
	(b) yellow green	vertjaune	gelbgrün	verde amarillento	Comet	2
	green	vert	grün	verde	Brewers Gold, Wye Target	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. 37-38 (*) VG	Only green varieties: Leaf: intensity of green color of upper side of blade	Seulement les variétés vertes: Feuille: intensité de couleur verte de la face supérieure du limbe	Nur grüne Sorten: Blatt: Intensität der Grünfärbung der Oberseite der Spreite	Únicamente las variedades verdes: Hoja: intensidad del color verde del haz del limbo		
QN	(a) light	clair	hell	claro	Brewers Gold	3
	(b) medium	moyen	mittel	medio	Nugget	5
	dark	foncé	dunkel	oscuro	Wye Target	7
6. 67 (*) MG (+)	Time of flowering	Époque de floraison	Zeitpunkt der Blüte	Época de floración		
QN	early	précoce	früh	precoz	Northern Brewer	3
	medium	moyenne	mittel	media	Wye Target	5
	late	tardive	spät	tardía	Hersbrucker Spät	7
7. 87-89 (*) VG	Plant: growth type	Plante: port	Pflanze: Wuchstyp	Planta: porte		
QL	dwarf	naine	Zwergtyp	enana	First Gold	1
	normal	normale	Normaltyp	normal	Hallertauer Magnum	2
8. 87-89 (*) VG (+)	Plant: shape	Plante: forme	Pflanze: Wuchsform	Planta: forma		
PQ	fusiform	fusiforme	spindelförmig	fusiforme	Northern Brewer	1
	fusiform to cylindrical	fusiforme à cylindrique	spindelförmig bis zylindrisch	fusiforme a cilíndrica	Hallertauer Taurus	2
	cylindrical	cylindrique	zylindrisch	cilíndrica	Hallertauer Magnum	3
	cylindrical to club-shaped	cylindrique à claviforme	zylindrisch bis keulenförmig	cilíndrica a forma de garrote	Willamette	4
	club-shaped	claviforme	keulenförmig	forma de garrote	Spalter Select	5
	cylindrical to conic	cylindrique à conique	zylindrisch bis kegelförmig	cilíndrica a cónica	Galena	6
	conic	conique	kegelförmig	cónica	Glacier	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (*)(+)	87-89 VG Plant: volume of head	Plante: volume de la tête	Pflanze: Kopfvolumen	Planta: volumen del cogollo		
QN	very low	très faible	sehr gering	muy bajo	First Gold	1
	low	faible	gering	bajo	Spalter	3
	medium	moyen	mittel	medio	Saphir	5
	high	élevé	hoch	alto	Nugget	7
	very high	très élevé	sehr hoch	muy alto	Spalter Select	9
10. (*)	87-89 VG Side shoot from middle third of plant: length	Pousse latérale depuis le tiers médian de la plante: longueur	Seittrieb aus dem mittleren Pflanzen-drittel: Länge	Brote lateral del tercio medio de la planta: longitud		
QN	short	courte	kurz	corto	First Gold	3
	medium	moyenne	mittel	medio	Northern Brewer	5
	long	longue	lang	largo	Tettnanger	7
	very long	très longue	sehr lang	muy largo	Late Cluster	9
11. (*)	87-89 VG Side shoot from upper third of plant: length	Pousse latérale depuis le tiers supérieur de la plante: longueur	Seittrieb aus dem oberen Pflanzen-drittel: Länge	Brote lateral del tercio superior de la planta: longitud		
QN	short	courte	kurz	corto	Northern Brewer	3
	medium	moyenne	mittel	medio	Columbus	5
	long	longue	lang	largo	Brewers Gold	7
12. (*)(+)	87-89 VG Side shoot from middle third of plant: density of foliage	Pousse latérale depuis le tiers médian de la plante: densité du feuillage	Seittrieb aus dem mittleren Pflanzen-drittel: Dichte der Belaubung	Brote lateral del tercio medio de la planta: densidad del follaje		
QN	sparse	faible	gering	escasa		3
	medium	moyenne	mittel	media	Fuggle	5
	dense	dense	hoch	densa	Northern Brewer	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. (*) (+)	87-89 VG Side shoot from <u>middle third</u> of plant: number of cones per node	Pousse latérale depuis le tiers médian de la plante: nombre de cônes par nœud	Seitentrieb aus dem mittleren Pflanzen- drittel: Anzahl Zapfen je Nodium	Brote lateral del tercio medio de la planta: número de conos por nudo		
QN	few	petit	gering	bajo	Spalter	3
	medium	moyen	mittel	medio	Hallertauer Merkur	5
	many	grand	groß	alto	Perle	7
14. (*) (+)	87-89 VG Side shoot from <u>middle third</u> of plant: total number of cones	Pousse latérale depuis le tiers médian de la plante: nombre total de cônes	Seitentrieb aus dem mittleren Pflanzen- drittel: Gesamtzahl der Zapfen	Brote lateral del tercio medio de la planta: número total de conos		
QN	few	petit	gering	bajo	Herald	3
	medium	moyen	mittel	medio	Hallertauer Magnum	5
	many	grand	groß	alto	Brewers Gold	7
15. (*) (+)	87-89 VG Side shoot from <u>upper third</u> of plant: total number of cones	Pousse latérale depuis le tiers supérieur de la plante: nombre total de cônes	Seitentrieb aus dem oberen Pflanzen- drittel: Gesamtzahl der Zapfen	Brote lateral del tercio superior de la planta: número total de conos		
QN	very few	très petit	sehr gering	muy bajo	Herald	1
	few	petit	gering	bajo	Spalter	3
	medium	moyen	mittel	medio	Tettnanger	5
	many	grand	groß	alto	Aurora	7
	very many	très grand	sehr groß	muy alto	Hersbrucker Spät	9
16. (*) (+)	89 MG Time of picking maturity of cones	Époque de maturité pour la cueillette des cônes	Zeitpunkt der Pflückreife der Zapfen	Época de madurez para la recolección de conos		
QN	early	précoce	früh	precoz	Northern Brewer	3
	medium	moyenne	mittel	media	Hallertauer Merkur	5
	late	tardive	spät	tardía	Nugget	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. 89 (*) VG	Cone: size	Cône: taille	Zapfen: Größe	Cono: tamaño		
QN	(c) small	petit	klein	pequeño	Saphir	3
	medium	moyen	mittel	medio	Hersbrucker Spät	5
	large	grand	groß	grande	Tettnanger	7
18. 89 (*) VG (+)	Cone: shape	Cône: forme	Zapfen: Form	Cono: forma		
PQ	(c) cylindrical	cylindrique	zylindrisch	cilíndrica	Wye Target	1
	narrow ovate	ovale étroit	schmal eiförmig	oval estrecha	Northern Brewer	2
	medium ovate	ovale moyen	mittel eiförmig	oval media	Nugget	3
	broad ovate	ovale large	breit eiförmig	oval ancha	Brewers Gold	4
	globose	globulaire	kugelförmig	globosa		5
19. 89 (*) VG	Cone: degree of opening of bracts	Cône: degré d'ouverture des bractées	Zapfen: Öffnungsgrad der Deckblätter	Cono: grado de apertura de las brácteas		
QN	(c) closed	fermées	geschlossen	cerradas	Wye Target	1
	slightly open	légèrement ouvertes	leicht geöffnet	ligeramente abiertas	Perle	2
	clearly open	nettement ouvertes	deutlich geöffnet	claramente abiertas	Brewers Gold	3
20. 89 (*) VG	Cone: intensity of green color	Cône: intensité de la couleur verte	Zapfen: Intensität der Grünfärbung	Cono: intensidad del color verde		
QN	(c) light	clair	hell	claro	Admiral	3
	medium	moyen	mittel	medio	Wye Challenger	5
	dark	foncé	dunkel	oscuro	Wye Target	7
21. 89 (*) VG	Bract: size	Bractée: taille	Deckblatt: Größe	Bráctea: tamaño		
QN	(c) small	petite	klein	pequeño	Saphir	3
	medium	moyenne	mittel	medio	Northern Brewer	5
	large	grande	groß	grande	Herald	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22. 89 (*) VG (+)	Bract: ratio width/ length	Bractée: rapport largeur/longueur	Deckblatt: Verhältnis Breite/Länge	Bráctea: relación anchura/longitud		
QN	(c) small	petit	klein	pequeña		3
	medium	moyen	mittel	media	Aurora	5
	large	grand	groß	grande	Wye Target	7
23. 89 (*) VG (+)	Bract: length of apex	Bractée: longueur du sommet	Deckblatt: Länge der Spitze	Bráctea: longitud del ápice		
	very short	très court	sehr kurz	muy corto		1
QN	(c) short	court	kurz	corto	Wye Target	3
	medium	moyen	mittel	medio	Perle	5
	long	long	lang	largo	Brewers Gold	7
	very long	très long	sehr lang	muy largo		9

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 5: Dwarf types should be observed at a comparable stage of development to that of normal types.
- (b) Leaves: All observations on leaves should be made on fully developed leaves of the main shoot.
- (c) Cones and bracts: All observations on cones and bracts should be made on the largest, fully developed cones from the head of plant (upper fifth of the plant)

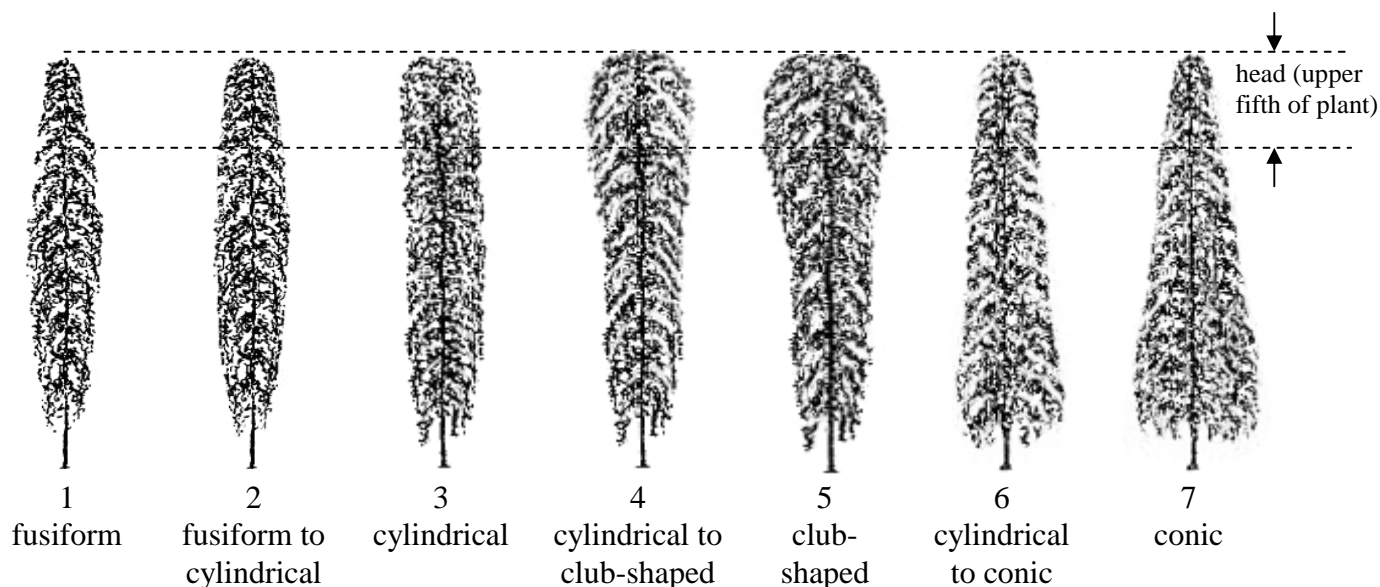
8.2 *Explanations for individual characteristics*

Ad. 6: Time of flowering

Approximately 70% of flowers open on 50% of plants.

Ad. 8: Plant: shape

Ad. 9: Plant: volume of head



“Plant: volume of head” is related to “Plant: shape” but there is also clear variation of head volume within the same shape. The same volume of head can be observed in different shapes. Therefore, both characteristics should be observed.

Ad. 12: Side shoot from middle third of plant: density of foliage

Observation in the middle third of side shoots. The total appearance of leaves of the side shoots should be observed without considering number and size of leaves separately.

Ad. 13: Side shoot from middle third of plant: number of cones per node

Ad. 14: Side shoot from middle third of plant: total number of cones

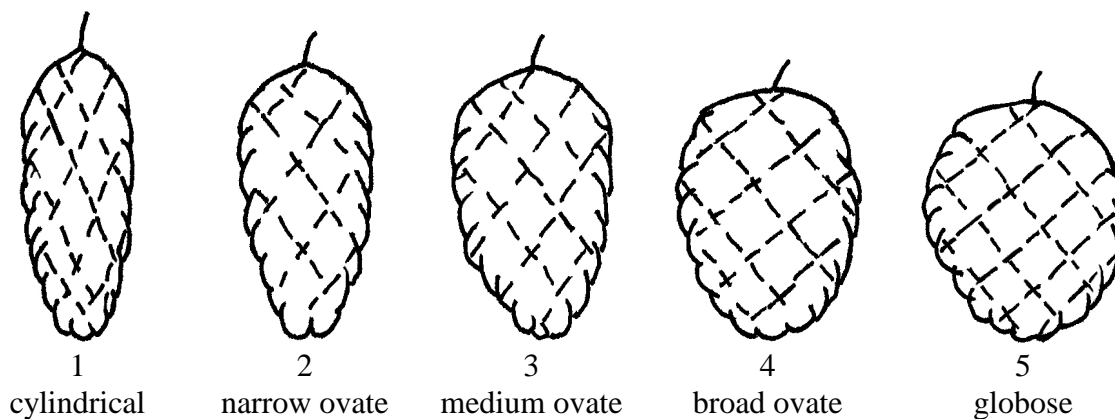
Ad. 15: Side shoot from upper third of plant: total number of cones

The number of cones on side shoots can vary within plants. Therefore, side shoots from the middle and the upper third of plant should be considered separately (char. 14 and 15). In addition, a difference in the number of cones per node may be observed (char. 13). The number of cones per node should be assessed in the middle part of side shoots from the middle third of plant.

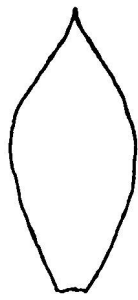
Ad 16: Time of picking maturity of cones

To be observed when almost all cones have reached the final degree of opening of bracts and have produced golden lupulin and fully developed aroma. The cones rustle when lightly pressed between fingers.

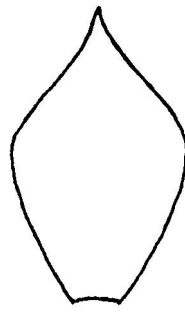
Ad. 18: Cone: shape



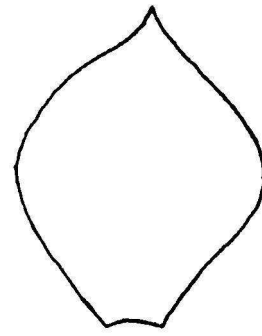
Ad. 22: Bract: ratio width/length



3
small

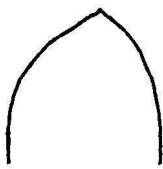


5
medium

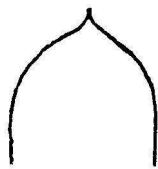


7
large

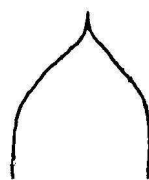
Ad. 23: Bract: length of apex



1
very short



3
short



5
medium



7
long



9
very long

8.3. *Phenological growth stages and BBCH-identification keys of Hop*
(*Humulus lupulus L.*), *Rossbauer et al., 1995*

<i>Code</i>	<i>Description</i>
Principal growth stage 0	Sprouting
00	Dormancy: Rootstock without shoots (uncut)
01	Dormancy: Rootstock without shoots (cut)
07	Rootstock with shoots (uncut)
08	Beginning of shoot-growth (rootstock cut)
09	Emergence: First shoots emerge at the soil surface
Principal growth stage 1	Leaf development
11	First pair of leaves unfolded
12	Second pair of leaves unfolded (beginning of twining) stages continuous till ...
19	Nine and more pairs of leaves unfolded
Principal growth stage 2	Formation of side shoots
21	First pair of side shoots visible
22	Second pair of side shoots visible stages continuous till ...
29	Nine and more pairs of side shoots visible (secondary side shoots occur)
Principal growth stage 3	Elongation of bines
31	Bines have reached 10 % of top wire height
32	Bines have reached 20 % of top wire height stages continuous till ...
38	Plants have reached the top wire
39	End of bine elongation
Principal growth stage 4	-
Principal growth stage 5	Inflorescence emergence
51	Inflorescence buds visible
55	Inflorescence buds enlarged
Principal growth stage 6	Flowering
61	Beginning of flowering: about 10 % of flowers open
65	Full flowering: about 50 % of flowers open
69	End of flowering
Principal growth stage 7	Development of cones
71	Beginning of cone development: 10 % of inflorescences are cones
75	Cone development half way: All cones are visible, cones are soft, stigmas still present
79	Cone development complete: Nearly all cones have reached full size
Principal growth stage 8	Maturity of cones
81	Beginning of maturity: 10 % of cones are compact
85	Advanced maturity: 50 % of cones are compact
87	70 % of cones are compact
89	Cones ripe for picking: cones closed; lupulin golden; aroma potential fully developed
Principal growth stage 9	Senescence, entry into dormancy
92	Overripeness: Cones yellow-brown discoloured, aroma deterioration
97	Dormancy: leaves and stems dead

9. Literature

Meier, U. (Editor), 1997: Growth Stages of Mono- and Dicotyledonous Plants. BBCH-Monograph. Blackwell Wissenschafts-Verlag, Berlin, Wien.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Humulus lupulus L."/>	
1.2 Common Name	<input type="text" value="Hop"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross []
(please state parent varieties)

(b) partially known cross []
(please state known parent variety(ies))

(c) unknown cross []

4.1.2 Mutation []
(please state parent variety)

4.1.3 Discovery and development []
(please state where and when discovered and how developed)

4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.1 Main shoot: anthocyanin coloration (1)		
absent or very weak	Late Cluster	1[]
weak	Willamette	3[]
medium	Spalter	5[]
strong	Northern Brewer	7[]
very strong	Wye Challenger	9[]
5.2 Plant: growth type (7)		
dwarf	First Gold	1[]
normal	Hallertauer Magnum	2[]
5.3 Side shoot from <u>middle third</u> of plant: length (10)		
short	First Gold	3[]
medium	Northern Brewer	5[]
long	Tettnanger	7[]
very long	Late Cluster	9[]
5.4 Side shoot from <u>upper third</u> of plant: total number of cones (15)		
very few	Herald	1[]
few	Spalter	3[]
medium	Tettnanger	5[]
many	Aurora	7[]
very many	Hersbrucker Spät	9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.5 Time of picking maturity of cones (16)		
early	Northern Brewer	3[]
medium	Hallertauer Merkur	5[]
late	Nugget	7[]
5.6 Cone: size (17)		
small	Saphir	3[]
medium	Hersbrucker Spät	5[]
large	Tettnanger	7[]
5.7 Cone: degree of opening of bracts (19)		
closed	Wye Target	1[]
slightly open	Perle	2[]
clearly open	Brewers Gold	3[]
5.8 Bract: length of apex (23)		
very short		1[]
short	Wye Target	3[]
medium	Perle	5[]
long	Brewers Gold	7[]
very long		9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
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Example

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [] No []

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [] No []

(If yes, please provide details)

7.3 Type of use of variety

- Aroma []
- Bitter []
- High alpha []
- Ornamental []
- other (please specify) []

.....

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 (b) is yes, please attach a copy of the authorization.

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 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 the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

- | | | |
|---|---------|--------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma) | Yes [] | No [] |
| (b) Chemical treatment (e.g. growth retardant, pesticide) | Yes [] | No [] |
| (c) Tissue culture | Yes [] | No [] |
| (d) Other factors | Yes [] | No [] |

Please provide details for where you have indicated “yes”.

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant's name

Signature

Date

[End of document]