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## INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

## RYEGRASS \*

UPOV code: LOLIU\_PER  
 LOLIU\_MUL\_ITA  
 LOLIU\_MUL\_WES  
 LOLIU\_BOU  
 LOLIU\_RIG  
 (Lolium spp.)

## GUIDELINES

## FOR THE CONDUCT OF TESTS

## FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*Prepared by an expert from the United Kingdom*

*to be considered by the  
 Technical Committee at its forty-second session  
 to be held in Geneva, Switzerland, from April 3 to 5, 2006*

## Alternative Names:\*

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Lolium perenne</i> L.	Perennial ryegrass	Ray-grass anglais	Deutsches Weidelgras	Ballico perenne, Raygrás inglés
<i>Lolium multiflorum</i> Lam. <i>ssp. italicum</i> (A. Br.) Volkart; <i>Lolium multiflorum</i> Lam. <i>ssp. non alternativum</i> .	Italian ryegrass	Ray-grass d'Italie	Italienisches Raygras	Ballico italiano, Raygrás italiano
<i>Lolium multiflorum</i> Lam. <i>var.</i> <i>westerwoldicum</i> Wittm; <i>Lolium</i> <i>multiflorum</i> Lam. <i>ssp. alternativum</i> .	Westerwolds ryegrass	Ray-grass de Westerwold	Welsches Weidelgras	Raigrás de Westerwold
<i>Lolium boucheanum</i> Kunth; <i>Lolium x</i> <i>hybridum</i> Hausskn..	Hybrid ryegrass	Ray-grass hybride	Bastardweidelgras, Oldenburgisches Weidelgras	Ballico híbrido, Raygrás híbrido
<i>Lolium rigidum</i> Gaudin.	Stiff darnel, Wimmera ryegrass	Ivraie raide	Steifre Lolch	Raygrás rígido

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 guidelines ("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](http://www.upov.int)), for the latest information.]

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## 1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Lolium perenne* L., *Lolium multiflorum* Lam. *ssp. italicum* (A. Br.) Volkart, *Lolium multiflorum* Lam. *var. westerwoldicum*, and *Lolium boucheanum* Kunth. and *Lolium rigidum* Gaudin.

## 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 seed.

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

1.5 kg

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should be stated by the applicant.

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*

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.

3.3.3 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

MS: measurement of a number of individual plants or parts of plants

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

VS: visual assessment by observation of individual plants or parts of plants

3.3.4 The recommended type of plot in which to observe the characteristic is indicated by the following key in the second column of the Table of Characteristics:

A: spaced plants

B: row plot

C: special test

### 3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 60 spaced plants which should be divided between at least 2 replicates. In addition, the test may include 8 meters of row plot which should be divided between at least 2 replicates. The density of the seed should be such that around 200 plants/meter can be expected.

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*

3.5.1 Unless otherwise indicated, all observations on single plants should be made on 60 plants or parts taken from each of 60 plants and any other observations made on all plants in the test. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1.

### 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 The assessment of uniformity should be according to the recommendations for cross-pollinated varieties in the General Introduction.

### 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 seed 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:

*Lolium multiflorum* Lam. var. *westerwoldicum* and *Lolium rigidum* Gaudin.:

- (a) Plant: ploidy (characteristic 1)
- (b) Only varieties of Lmw and Lr: Plant: time of inflorescence emergence (without vernalization) (characteristic 10)
- (c) Plant: length of longest stem, inflorescence included (when fully expanded) (characteristic 18)

*Lolium perenne* L., *Lolium multiflorum* Lam. ssp. *italicum* (A. Br.) Volkart and *Lolium boucheanum* Kunth.

- (a) Plant: ploidy (characteristic 1)
- (b) Only varieties of Lp, Lmi and Lb: Plant: time of inflorescence emergence (after vernalization) (characteristic 12)
- (c) Plant: length of longest stem, inflorescence included (when fully expanded) (characteristic 18)

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

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

#### 6.4.2 Species of example varieties

(Lp):	<i>Lolium perenne</i> L.
(Lmi):	<i>Lolium multiflorum</i> Lam. <i>italicum</i> (A. Br.) Volkart
(Lmw):	<i>Lolium multiflorum</i> Lam. <i>var. westerwoldicum</i> Wittm
(Lb):	<i>Lolium boucheanum</i> Kunth.
(Lr):	<i>Lolium rigidum</i> Gaudin.

### 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: single measurement of a group of plants or parts of plants – see Chapter 3.3.3

MS: measurement of a number of individual plants or parts of plants – see Chapter 3.3.3

VG: visual assessment by a single observation of a group of plants or parts of plants – Chapter 3.3.3

VS: visual assessment by observation of individual plants or parts of plants” – see Chapter 3.3.3

A: spaced plants – see Chapter 3.3.4

B: row plot – see Chapter 3.3.4

C: special test – see Chapter 3.3.4

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

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

(Lp): *Lolium perenne* L. See Chapter 6.4.2

(Lmi): *Lolium multiflorum* Lam. *italicum* (A. Br.) Volkart See Chapter 6.4.2

(Lmw): *Lolium multiflorum* Lam. *var. westerwoldicum* Wittm See Chapter 6.4.2

(Lb): *Lolium boucheanum* Kunth. See Chapter 6.4.2

(Lr): *Lolium rigidum* Gaudin. See Chapter 6.4.2

(10)-(68) 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
<b>1. C</b>	<b>Plant: ploidy</b>					
(*)						
(+)						
<b>QL</b>	diploid				Denver (Lp), Lemtal (Lmi)	2
	tetraploid				Condesa (Lp), Celebrity (Lmi)	4
<b>2. 20-29</b>	<b>Plant: vegetative growth habit</b>					
	<b>VS A (without</b>					
	<b>VG B vernalization)</b>					
<b>QN (a)</b>	erect					1
	semi-erect				Lemtal (Lmi), Yatsyn (Lp)	3
	medium				Jumbo (Lp), Limeta (Lmi)	5
	semi-prostrate				Condesa (Lp)	7
	prostrate					9
<b>3. 20-29</b>	<b>Leaf: length (at vegetative stage)</b>					
	<b>VG B</b>					
<b>QN</b>	very short					1
	short				Aragon (Lp)	3
	medium				Babylon (Lp)	5
	long				Corona (Lp)	7
	very long				Lipo (Lmi)	9



	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
<b>4.</b>	<b>20-29 Leaf : width (at vegetative stage)</b>						
	<b>VG B</b>						
<b>QN</b>	very narrow					1	
	narrow				Aragon (Lp)	3	
	medium				Mondial (Lp)	5	
	broad				Veritas (Lp), Baroldi (Lmw)	7	
	very broad				Lipo (Lmi), Promenade (Lmw)	9	
<b>5.</b>	<b>20-29 Leaf: intensity of green color</b>						
	<b>VG B</b>						
<b>QN</b>	very light					1	
	light				Abermont (Lp)	3	
	medium				Bellem (Lmi), Melino (Lp)	5	
	dark				Condesa (Lp)	7	
	very dark				Avon (Lp)	9	
<b>6.</b>	<b>30 Plant: width (after vernalization)</b>						
	<b>MS A</b>						
	<b>VS A</b>						
<b>QN</b>	(c) very narrow				Aberelf (Lp)	1	
	narrow				Disco (Lp)	3	
	medium				Twystar (Lp), Abercomo (Lmi)	5	
	wide				Prana (Lp), Solid (Lb)	7	
	very wide				Barylou (Lp)	9	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>7.</b>	<b>30-39 Plant: vegetative growth habit (after vernalization)</b>					
	<b>VS A</b>					
	<b>VG B</b>					
<b>QN</b>	<b>(a)</b> erect					1
	semi-erect				Grasslands Nui (Lp), Lemtal (Lmi)	3
	medium				Palmer (Lp), Texy (Lb)	5
	semi-prostrate				Cheops (Lp), Polly (Lb)	7
	prostrate					9
<b>8.</b>	<b>30-39 Plant: height (after vernalization)</b>					
	<b>VG B</b>					
<b>QN</b>	very short					1
	short				Polarstar (Lp)	3
	medium				Fennema (Lp)	5
	tall				Fox (Lmi)	7
	very tall					9
<b>9.</b>	<b>50 Plant: number of vegetative tillers</b>					
	<b>VG B</b>					
<b>QN</b>	very low				Bargold (Lp)	1
	low				Lipresso (Lp)	3
	medium				Gator (Lp)	5
	high				Ausric (Lp)	7
	very high					9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>10. 50</b>	<b>Only varieties of</b>					
<b>(*)</b>	<b>Lmw and Lr: Plant:</b>					
	<b>MS A time of inflorescence</b>					
	<b>MGB emergence (without vernalization)</b>					
<b>QN (b)</b>	very early				Grazer (Lmw)	1
	early				Lifloria (Lmw)	3
	medium				Elunaria (Lmw)	5
	late				Advance (Lmw)	7
	very late					9
<b>11. 50</b>	<b>Plant: tendency to form inflorescences</b>					
<b>(+)</b>	<b>VS A (without vernalization)</b>					
<b>VG B</b>	<b>vernalization)</b>					
<b>QN</b>	absent or very weak				Bargold (Lp), Barmultra (Lmi)	1
	weak				Vital (Lp)	3
	medium				Faveur (Lp)	5
	strong				Lemtal (Lmi)	7
	very strong				Weldra (Lmw)	9
<b>12. 50</b>	<b>Only varieties of Lp,</b>					
<b>(*)</b>	<b>Lmi and Lb: Plant:</b>					
	<b>MS A time of inflorescence</b>					
	<b>MGB emergence (after vernalization)</b>					
<b>QN (b)</b>	very early				Limona (Lp)	1
	early				Labrador (Lp)	3
	medium				Greenway (Lp), Lemtal (Lmi)	5
	late				Livonne (Lp)	7
	very late				Barpolo (Lp)	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>13. 50</b>	<b>Plant: natural height at inflorescence emergence</b>					
	<b>MS A</b>					
<b>QN (d)</b>	very short				Loretta (Lp)	1
	short				Superstar (Lp)	3
	medium				Polly (Lb)	5
	tall				Lemtal (Lmi)	7
	very tall					9
<b>14. 50</b>	<b>Plant: width at inflorescence emergence</b>					
	<b>MS A</b>					
	<b>VS A</b>					
<b>QN (c)</b>	very narrow				Brightstar (Lp)	1
	narrow				Navajo (Lp), Lemtal (Lmi)	3
	medium				Vital (Lp), Monarque (Lmi)	5
	wide				Moronda (Lp), Skipper (Lb)	7
	very wide				Fanal (Lp)	9
<b>15 50</b>	<b>Flag leaf: length</b>					
<b>(*)</b>						
	<b>MS A</b>					
<b>QN (d)</b>	very short				Brightstar (Lp)	1
	short				Sauvignon (Lp)	3
	medium				Abergold (Lp), Brutus (Lb) Fastyl (Lmi)	5
	long				Twins (Lp), Aberlinnet (Lb)	7
	very long				Cyrano (Lmi)	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>16. 50</b>	<b>Flag leaf: width</b>					
(*)						
	<b>MS A</b>					
<b>QN (d)</b>	very narrow				Bargold (Lp)	1
	narrow				Profit (Lp)	3
	medium				Limona (Lp)	5
	broad				Eurostar (Lp), Skipper (Lb)	7
	very broad				Lipo (Lmi)	9
<b>17. 50</b>	<b>Flag leaf: length/width ratio</b>					
	<b>MS A</b>					
<b>QN (d)</b>	very low					1
	low				Howard (Lmi)	3
	medium				Fabio (Lmi), Mondial (Lp)	5
	high				Veritas (Lp)	7
	very high					9
<b>18 60-68</b>	<b>Plant: length of longest stem, inflorescence included (when fully expanded)</b>					
(*)						
(+)	<b>MS A</b>					
<b>QN (e)</b>	very short					1
	short				Loretta (Lp)	3
	medium				Lipondo (Lp)	5
	long				Lilotta (Lp)	7
	very long				Emily (Lmi)	9

English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>19. 60-68 Plant: length of upper internode</b>					
<b>(+) MS A</b>					
(e) very short					1
short				Adeline (Lp)	3
medium				Lemtal (Lmi), Choice (Lp)	5
long				Montblanc (Lmi)	7
very long				Lirasand (Lmw)	9
<b>20. 60-68 Inflorescence: length</b>					
<b>MS A</b>					
QN (e) very short				Sunbright (Lp)	1
short				Alamo (Lmi), Bargold (Lp)	3
medium				Taurus (Lp) Vigor (Lp)	5
long				Lilotta (Lp)	7
very long					9
<b>21. 60-68 Inflorescence: number of spikelets</b>					
<b>MS A</b>					
QN (e) very few					1
few				Abersprite (Lp)	3
medium				Acento (Lp), Lemtal (Lmi)	5
many				Lipo (Lmi)	7
very many					9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>22. 60-68 Inflorescence: density</b>						
<b>(+) MS A</b>						
<b>QN</b>	<b>(e)</b>					
	very lax					1
	lax				Concord (Lmi)	3
	medium				Montagne (Lp), Meritra (Lmi)	5
	dense				Bastion (Lp)	7
	very dense					9
<b>23. 60-68 Inflorescence: length of outer glume on MS A basal spikelet</b>						
<b>QN</b>	<b>(e)</b>					
	very short				Abercomo (Lmi)	1
	short				Prestyl (Lmi)	3
	medium				Fennema (Lp), Gazella (Lb)	5
	long				Meradonna (Lp), Taxy (Lb)	7
	very long				Bastion (Lp)	9
<b>24. 60-68 Inflorescence: length of basal spikelet MS A excluding awn</b>						
<b>QN</b>	<b>(e)</b>					
	very short				Abercomo (Lmi)	1
	short				Sunbright (Lp), Bartissimo (Lmi)	3
	medium				Pippin (Lp), Barprisma (Lmi)	5
	long				Herbus (Lp), Storm (Lb)	7
	very long				Bastion (Lp)	9

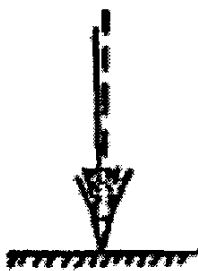
8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

(a) Growth habit

Characteristic 2 may be recorded during the growing season in which the trials are planted.

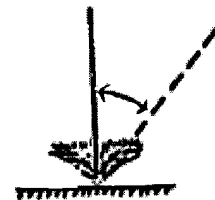
The observations should be made visually from the attitude of the leaves of the plant as a whole. The angle formed by the imaginary line through the region of greatest leaf density and the vertical should be used.



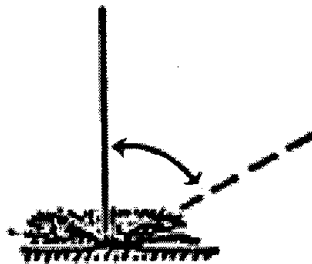
1  
erect



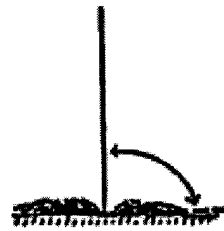
3  
semi-erect



5  
medium



7  
semi-prostrate



9  
prostrate

(b) Time of inflorescence emergence

Characteristic 10: Timing of observations will depend upon time of planting.

Spaced plants or row plots should be observed at least twice per week.



### Plots with spaced plants

The date of inflorescence emergence of each single plant should be observed. A single plant is considered to have headed when the tip of three inflorescences can be seen protruding from the flag leaf sheath (Growth Stage DC 50). From the single plant data, a mean date per plot and a mean date per variety is obtained.

### Row plots

The date of inflorescence emergence is the date at which the average plot stage 2 (Growth Stage DC 50) has been reached. This date should, if necessary, be obtained by interpolation.

- |     |       |                                                     |
|-----|-------|-----------------------------------------------------|
| (1) | DC 45 | Boot swollen (late-boot stage)                      |
| (2) | DC 50 | First spikelet of inflorescence just visible        |
| (3) | DC 52 | 25% of the inflorescence emerged (across all stems) |
| (4) | DC 54 | 50% of the inflorescence emerged (across all stems) |

### (c) Plant: width

To allow for irregular plant shapes (for example due to wind shaping effects) the plant width is determined by taking two measurements (MS A) or by making two visual observations (VS A) of the diameter across the plant at right angles to each other and then using the average of these two figures as the plant width.

- (d) To be recorded on each individual plant at the time of inflorescence emergence (Growth Stage DC 50), that is at the same time as Characteristic 10 for *Lolium multiflorum* Lam. var. *westerwoldicum* and *Lolium rigidum* Gaudin. and Characteristic 12 for *Lolium perenne* L., *Lolium multiflorum* Lam. ssp. *italicum* (A. Br.) Volkart and *Lolium boucheanum* Kunth.”.

- (e) Measurements for characteristics 18 to 24 should be made on the longest stem.

## 8.2 *Explanations for individual characteristics*

### Ad. 1: Plant: ploidy

The ploidy of the plant can be determined either by standard cytological methods or by observing the occurrence of 5-band genotypes (which are present only in tetraploid varieties) in phosphoglucosomerase (PGI) isoenzyme electrophoresis.

### Ad. 11: Plant: tendency to form inflorescences (without vernalization)

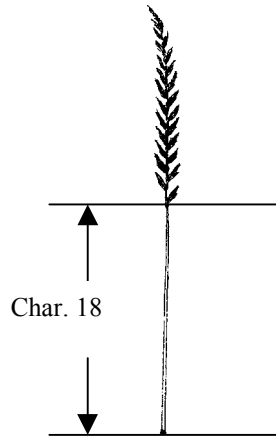
The number of plants showing at least three inflorescences should be recorded for each variety. To be assessed on one occasion on the whole trial when the varieties are judged to have reached their full expression of this characteristic.

Ad. 18: Plant: length of longest stem, inflorescence included (when fully expanded)

To be recorded in the field from ground level, when the inflorescence is fully expanded.

Ad. 19: Plant: length of upper internode

To be measured from the top node to the base of the inflorescence.



Ad. 22: Inflorescence: density

This characteristic is calculated by dividing Characteristic 20 (Inflorescence: length) by Characteristic 21 (Inflorescence: number of spikelets)

8.3 *Growth stages of grasses 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 more tillers            |

*Stem elongation*

- DC 30 Pseudo-stem erection (formed by sheaths of leaves)
- DC 31 First node detectable (early stem extension across all stems)
- DC 35 Fifth node detectable (50% extension across all stems)
- DC 39 Flag leaf ligula/collar just visible (pre-boot stage)

*Booting*

- DC 41 Flag leaf sheath extending (little enlargement of the inflorescence, early boot-stage)
- DC 45 Boots swollen (late-boot stage)
- DC 47 First leaf sheath opening
- DC 49 First awns visible (in awned forms only)

*Inflorescence emergence (mostly non-synchronous)*

- DC 50 First spikelet of inflorescence just visible
- DC 52 25% of the inflorescence emerged (across all stems)
- DC 54 50% of the inflorescence emerged (across all stems)
- DC 56 75% of the inflorescence emerged (across all stems)
- DC 58 Emergence of inflorescence completed

*Anthesis (mostly non-synchronous)*

- DC 60 Beginning of anthesis
- DC 64 Anthesis half-way
- DC 68 Anthesis complete

## 9. Literature

Baltjes, H.J., Klein Geltink, D.J.A., Nienhuis, K.H. and Luesink, B. (1985), "Linking Distinctiveness and Description of Varieties," *Journal of the National Institute of Agricultural Botany*, 17, pages 9-19

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Camlin, M.S., Watson, S., Waters, B.G. and Weatherup, S.T.C. (2001), "The potential for management of reference collections in herbage variety registration trials using a cyclic planting system for reference varieties". *Plant Varieties and Seeds*, 14, pages 1-14.

Hawkins, R.P. (1958), "The Classification of the Strains (Varieties) of Herbage Plants," *Journal of the National Institute of Agricultural Botany*, 9, pages 434-449

Patterson, H.D. and Weatherup S.T.C. (1984), "Statistical Criteria for Distinctness between Varieties of Herbage Crops," *Journal of Agricultural Science, Cambridge*, 102, pages 59-68

Squire A.M., (1962) A rapid technique for counting chromosomes in grass breeding studies. *Journal of the British Grassland Society*, 21(4), 305-306.

Tyler, B.F., Hayes, J.D. and Ellis Davies, W. (1985), "IBPGR/CEC Descriptive List for Forage Grasses," *International Board for Plant Genetic Resources (IBPGR)*, 83/90

Weatherup, S.T.C. (1980), "Statistical Procedures for Distinctness, Uniformity and Stability Trials," *Journal of Agricultural Science, Cambridge*, 94, page 31-46

Zadoks, J.C., T.T. Chang and C.F. Konzak, 1974. A decimal code for the growth stages of cereals. *Weed Research* 14: 415 – 421.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<b>TECHNICAL QUESTIONNAIRE</b> to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire (please indicate the relevant species):		
1.1.1 <i>Botanical Name</i>	<input type="text" value="Lolium perenne L."/>	[ ]
1.1.2 <i>Common Name</i>	<input type="text" value="Perennial ryegrass"/>	
1.2.1 <i>Botanical Name</i>	<input type="text" value="Lolium multiflorum Lam. ssp. italicum(A. Br. ) Volkart"/>	[ ]
1.2.2 <i>Common Name</i>	<input type="text" value="Italian ryegrass"/>	
1.3.1 <i>Botanical Name</i>	<input type="text" value="Lolium multiflorum Lam. var. westerwoldicum Wittm."/>	[ ]
1.3.2 <i>Common Name</i>	<input type="text" value="Westerwolds (annual) ryegrass"/>	
1.4.1 <i>Botanical Name</i>	<input type="text" value="Lolium boucheanum Kunth."/>	[ ]
1.4.2 <i>Common Name</i>	<input type="text" value="Hybrid ryegrass"/>	
1.5.1 <i>Botanical Name</i>	<input type="text" value="Lolium rigidum Gaudin"/>	[ ]
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"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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3. Proposed denomination and breeder's reference

Proposed denomination

(if available)

Breeder's reference

#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 parts of this information to be given 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
<b>5.1 Plant: ploidy (1)</b>		
diploid	Denver (Lp) Lemtal (Lmi)	2
tetraploid	Condesa (Lp) Celebrity (Lmi)	4
<b>5.2 <u>Only varieties of Lmw and Lr</u>: Plant: time of inflorescence emergence (10) (without vernalization)</b>		
very early	Grazer (Lmw)	1
early	Lifloria (Lmw)	3
medium	Elunaria (Lmw)	5
late	Advance (Lmw)	7
very late		9
<b>5.3 <u>Only varieties of Lp, Lmi and Lb</u>: Plant: time of inflorescence emergence (12) (after vernalization)</b>		
very early	Limona (Lp)	1
early	Labrador (Lp)	3
medium	Greenway (Lp), Lemtal (Lmi)	5
late	Livonne (Lp)	7
very late	Barpolo (Lp)	9

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.4 Plant: length of longest stem, inflorescence included (when fully expanded)</b> (18)		
very short		1
short	Loretta (Lp)	3
medium	Lipondo (Lp)	5
long	Lilotta (Lp)	7
very long	Emily (Lmi)	9

6. Similar varieties and differences from these varieties

*Please use the table, and space provided for comments, below 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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>Plant: length of longest stem, inflorescence included (when fully expanded)</i>	<i>short</i>	<i>medium</i>

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 Main use

- (a) forage [ ]
  - (b) amenity [ ]
  - (c) other [ ]
- (please provide details)

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 (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:
-------------------------	-----------------	-------------------

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]