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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

OATS

UPOV Code(s): AVENA_NUD; AVENA_SAT

Avena nuda L.;
Avena sativa L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Spain

to be considered by the

Technical Working Party for Agricultural Crops
at its forty-fifth session, to be held in Mexico City, Mexico,
from 2016-07-11 to 2016-07-15

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Avena nuda L.	Naked Oats	Avoine nue	Nackthafer	Avena desnuda
Avena sativa L., Avena byzantina K. Koch	Oats	Avoine	Hafer	Avena

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.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Avena nuda* L., *Avena sativa* L. (To read "...*Avena nuda* L. and *Avena sativa* 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 seed and panicle (if requested).

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

Seed: 3 kg
Panicle: 100

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.

The panicles should be well developed and should contain a sufficient number of viable seeds to establish a satisfactory row of plants for observation.

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 in Chapter 8.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 2000 Plants, which should be divided between at least 2 replicates.

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.

3.4.3 The assessment of characteristic "Plant: seasonal type" should be carried out on at least 300 plants.

If test on panicle rows is conducted, at least 100 panicle rows should be observed.

3.5 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.

4.1.4 Number of plants or parts of plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts of plants taken from each of 10 plants and any other observations made on all plants in the test, disregarding any off-type plants.

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.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation 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

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

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 recommended sample size for the assessment of uniformity is indicated by the following key in the table of characteristics:

A: sample size of 100 plants / parts of plants / panicle rows
B: sample size of 2000 plants

For the assessment of uniformity in a sample of 2000 plants, a population standard of 0.1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 2000 plants, 5 off-types are allowed.

For the assessment of uniformity in a sample of 100 panicle-rows, plants or parts of plants, a population standard of 1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 100 panicle-rows, plants or parts of plants, 3 off-types are allowed. A panicle-row is considered to be an off-type panicle-row if there is more than 1 off-type plant within that panicle-row.

For characteristics with the key “A” in the list of characteristics the assessment of uniformity can be done in 2 steps. In a first step, 20 plants or parts of plants are observed. If no off-types are observed, the variety is declared to be uniform. If more than 3 off-types are observed, the variety is declared not to be uniform. If 1 to 3 off-types are observed, an additional sample of 80 plants or parts of plants must be observed.

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 further examined by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the initial 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) Seed: color of lemma (characteristic 1)
(b) Stem: hairiness of uppermost node (characteristic 7)
(c) Glume: glaucosity (characteristic 10)
(d) Grain: husk (characteristic 16)
(e) Seasonal type (characteristic 22)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 **2**	**3** **4**	**5** **6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.1

6 Not applicable

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*)** **QL** **VG|A**			**00**			
		Seed: color of lemma					
		white				Firth (S), Gerald (W)	1
		yellow				Canyon (S), Mascani (W)	2
		brown				Prevision (W)	3
		black				Calatrava (W)	4
2.	**QN** **VG|B**		**(+)**	**25-29**			
		Plant: growth habit					
		erect	dressé	aufrecht	erecto	Erwin (S), Flavia (W)	1
		semi-erect	demi-dressé	halbaufrecht	semierecto	Calatrava (W), Canyon (S), Stella d'Oro (S)	3
		intermediate	demi-dressé à demi-étalé	intermediär	intermedio	Atego (S), Ivory (S)	5
		semi-prostrate	demi-étalé	halbliegend	semipostrado	Balado (W)	7
		prostrate	étalé	liegend	postrado	Ombrone (W)	9
3.	**QN** **VG|A**		**(+)**	**25-29**			
		Lowest leaves: hairiness of sheaths					
		absent or very weak				Calatrava (W), Karmela (S)	1
		weak				Argentina (Alt), Forridena (W)	2
		medium				Gerald (W), Stella d'Oro (S)	3
		strong				Balado (W)	4
		very strong					5
4.	**(*)** **QN** **VG|A**		**(+)**	**25-60**			
		Leaf blade: hairiness of margins					
		absent or very weak				Chimene (S), Ivory (S)	1
		weak				Calatrava (W), Pergamon (S)	3
		medium				Anchuela (W)	5
		strong				Ombrone (W), Stella d'Oro (S)	7
		very strong					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.		**QN VG|B**	**(+)**	**47-51**			
		Plant: frequency of plants with recurved flag leaves					
		absent or very low				Chimene (S)	1
		low				Argentina (Alt), Gerald (W)	3
		medium				Calatrava (W)	5
		high					7
		very high					9
6.	**(*)**	**QN MG|B**	**(+)**	**50-52**			
		Time of panicle emergence					
		very early				Rapidena (ALT)	1
		early				Maestro (W), Stella d'Oro (S)	3
		medium				Anchuela (W), Gabby (S), Ivory (S), Mascani (W)	5
		late				Calatrava (W), Mason (W), Pergamon (S), SW Argyle (S)	7
		very late				Balado (W)	9
7.	**(*)**	**QL VG|A**	**(+)**	**60-69**			
		Stem: hairiness of uppermost node					
		absent				Canyon (S), Gerald (W)	1
		present				Mascani (W), Scorpion (S)	9
8.	**(*)**	**QN VG|A**	**(+)**	**60-69**			
		Stem: intensity of hairiness of uppermost node					
		very weak					1
		weak				Anchuela (W)	3
		medium				Flavia (W)	5
		strong				Forridena (W)	7
		very strong					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9.		**QN VG|B**		**60-69**			
		Flag leaf: glaucosity of sheath					
		absent or very weak					1
		weak					3
		medium					5
		strong					7
		very strong					9
10.	**(*)**	**QN VG|B**		**65-69**			
		Glume: glaucosity					
		absent or very weak				Rapidena (ALT)	1
		weak				Hendon (W)	3
		medium				Atego (S)	5
		strong				Belinda (S)	7
		very strong				Odal (S)	9
11.		**QN VG|B**	**(+)**	**70-75**			
		Panicle: attitude of branches					
		erect				Carron (S)	1
		semi-erect				Canyon (S)	3
		horizontal				Balado (W), Ivory (S)	5
		drooping					7
		strongly drooping					9
12.		**QN MS|A/VG|A**		**70-75**			
		Glume: length					
		very short					1
		short				Calatrava (W)	3
		medium				Canyon (S), Mascani (W)	5
		long				Ombrone (W)	7
		very long					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**(*)**	**QN** **VG|A**		**70-75**			
		Primary grain: glaucosity of lemma					
		absent or very weak				Canyon (S), Evora (Alt), Mascani (W)	1
		weak				Flämingsprofi (S), Ringsaker (S)	3
		medium				Riina (S)	5
		strong				Gabby (S), Odal (S)	7
		very strong					9
14.	**(*)**	**QN** **MG|B**		**80-85**			
		Plant: length					
		very short	très courte	sehr kurz	muy corta	Balado (W), Hendon (W)	1
		short	courte	kurz	corta	Fergus (W), Rapidena (ALT)	3
		medium	moyenne	mittel	media	Calatrava (W), Mascani (W)	5
		long	longue	lang	larga	Gerald (W), SW Argyle (S)	7
		very long	très longue	sehr lang	muy larga	Forridena (W)	9
15.	**(*)**	**QN** **MS|A/VG|B**		**80-85**			
		Panicle: length					
		very short					1
		short				Carron (S), Flavia (W)	3
		medium				Balado (W), Firth (S)	5
		long				Anchuela (W), Canyon (S)	7
		very long				Forridena (W)	9
16.	**(*)**	**QL** **VG|B**		**80-92**			
		Grain: husk					
		absent				Hendon (W), Lennon (S)	1
		present				Canyon (S), Mascani (W)	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.	**QN VG|A**		**92**			
	Primary grain: tendency to be awned					
	absent or very weak				Flämingsprofi (S)	1
	weak				Grafton (W)	3
	medium				Bastion (W)	5
	strong				Charming (W)	7
	very strong				Ombrone (W)	9
18.	**QN MG|A/MS|A**		**92**			
	Primary grain: length of lemma					
	very short					1
	short				Firth (S), RGT Victorious (W)	3
	medium				Canyon (S), SW Dalguise (W)	5
	long				Ivory (S)	7
	very long				Ombrone (W)	9
19.	**QN VG|A**	**(+)**	**92**			
	Primary grain: hairiness of base					
	absent or very weak				Canyon (S), Flavia (W)	1
	weak				Gerald (W)	2
	medium				Calatrava (W), Stella d'Oro (S)	3
	strong				Ombrone (W), Rapidena (ALT)	4
	very strong				Rogar 8 (W)	5
20.	**QN VG|A**	**(+)**	**92**			
	Primary grain: length of basal hairs					
	short				Balado (W), Ivory (S)	1
	medium				Chimene (S)	3
	long				Prevision (W), Stella d'Oro (S)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21.		**QN VG|A**	**(+)**	**92**			
		Primary grain: length of rachilla					
		short				Prevision (W)	1
		medium				Stella d'Oro (S)	3
		long				Forridena (W)	5
22.	**(*)**	**PQ VG**	**(+)**	**-**			
		Seasonal type					
		winter type				Calatrava (W), Mascani (W)	1
		alternative type				Rapidena (ALT)	2
		spring type				Stella d'Oro (S), SW Argyle (S)	3

8. Explanations on the Table of Characteristics

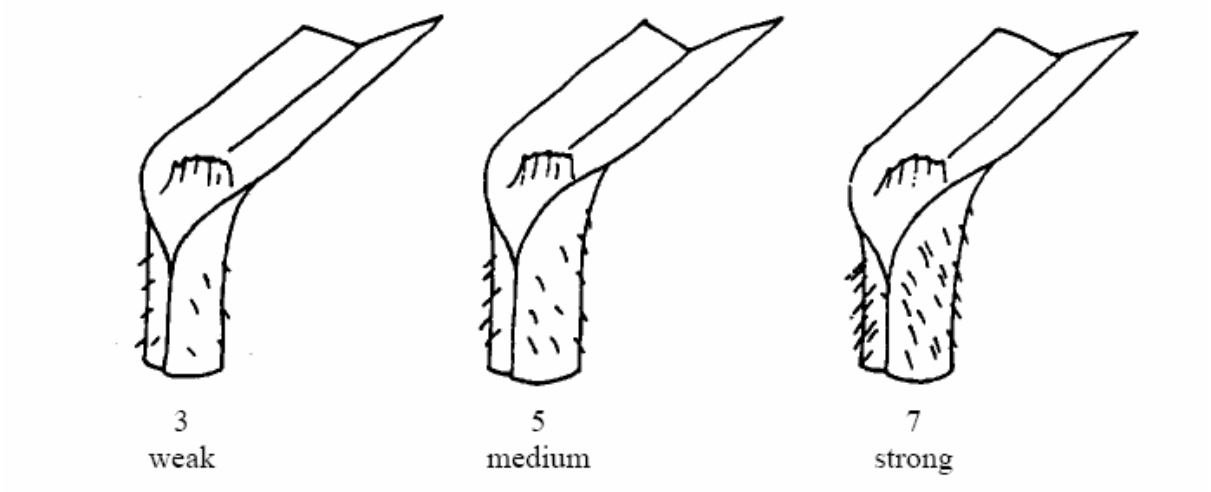
8.1 Explanations for individual characteristics

Ad. 2: Plant: growth habit

1 erect | 3 semi-erect | 5 intermediate | 7 semi-prostrate | 9 prostrate

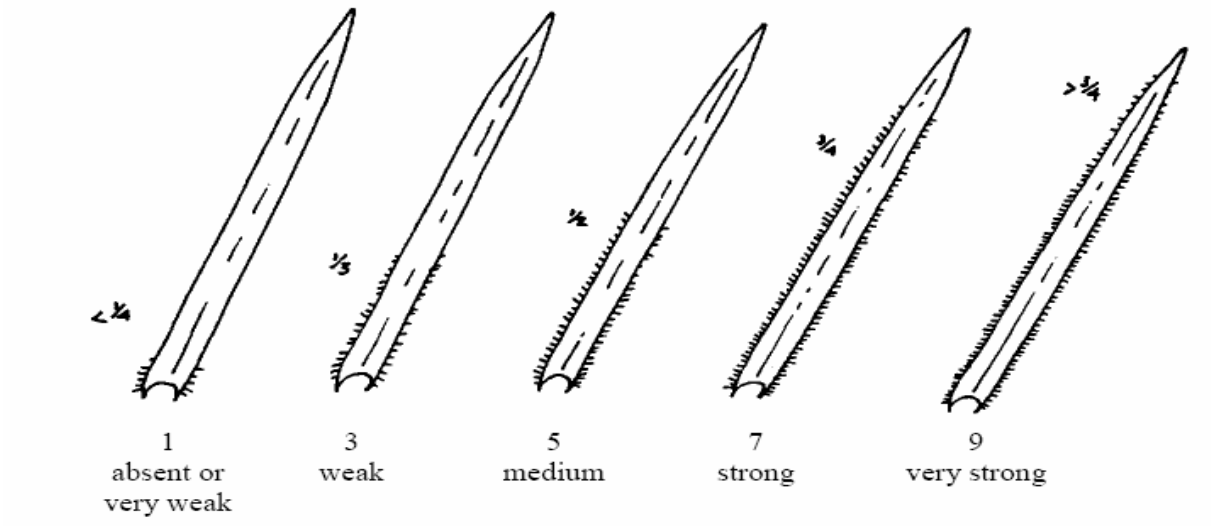
The growth habit should be assessed visually from the attitude of the leaves and tillers. The angle formed by the outer leaves and the tillers with an imaginary vertical axis should be used.

Ad. 3: Lowest leaves: hairiness of sheaths



3 weak | 5 medium | 7 strong

Ad. 4: Leaf blade: hairiness of margins



1 absent or very weak | 3 weak | 5 medium | 7 strong | 9 very strong

To be recorded at the leaf of the plant below the flag one where the strongest expression is observed.

Ad. 5: Plant: frequency of plants with recurved flag leaves

1 (absent or very low): almost all or all flag leaves are rectilinear

3 (low): about 1/4 of the plants with recurved flag leaves

5 (medium): about 1/2 of the plants with recurved flag leaves

7 (high): about 3/4 of the plants with recurved flag leaves

9 (very high): almost all or all flag leaves are recurved

Ad. 6: Time of panicle emergence

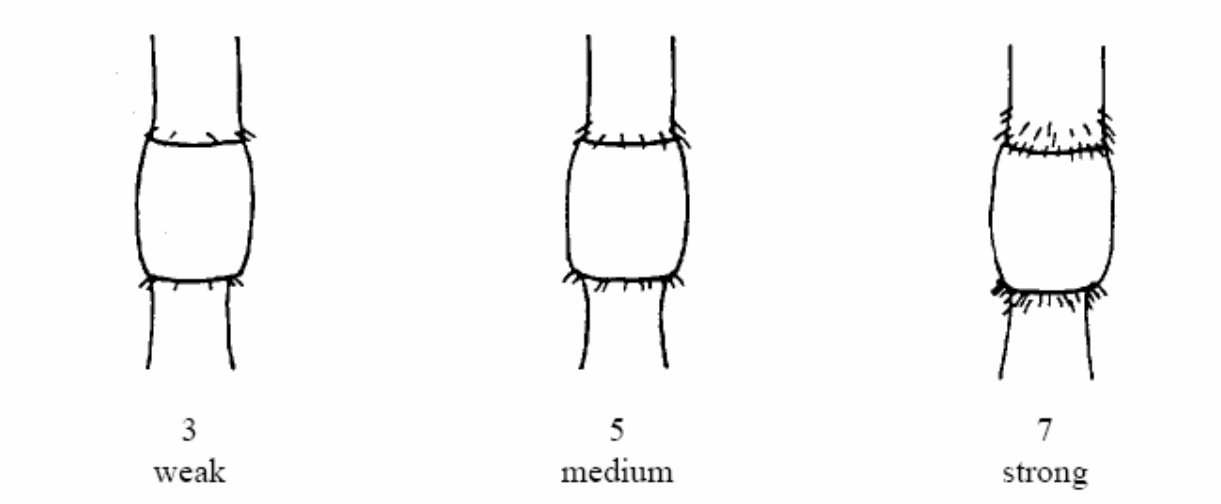
Time of panicle emergence is reached when the first spikelet is visible on 50% of panicles.

Ad. 7: Stem: hairiness of uppermost node

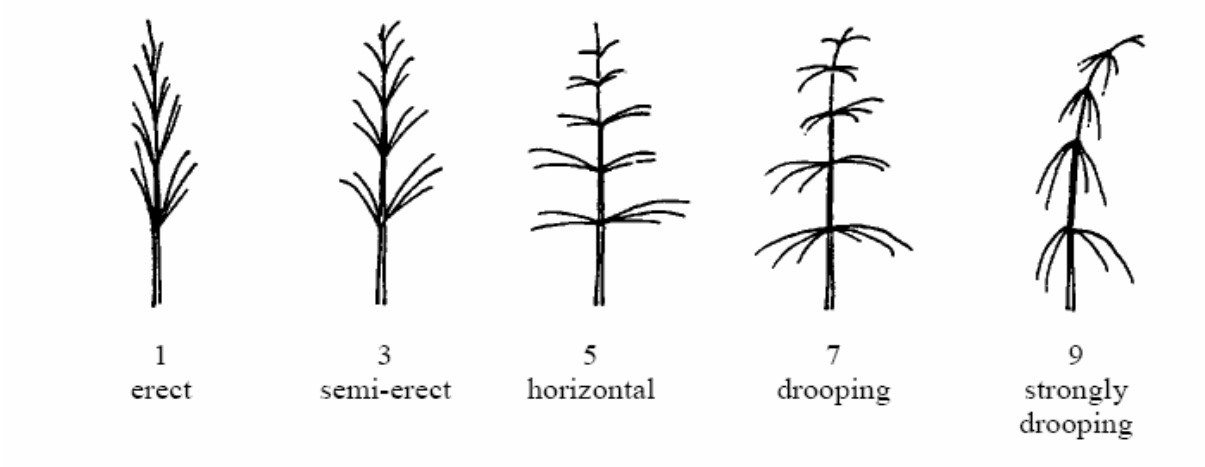
The presence of very few hairs should be considered as present.

Ad. 8: Stem: intensity of hairiness of uppermost node

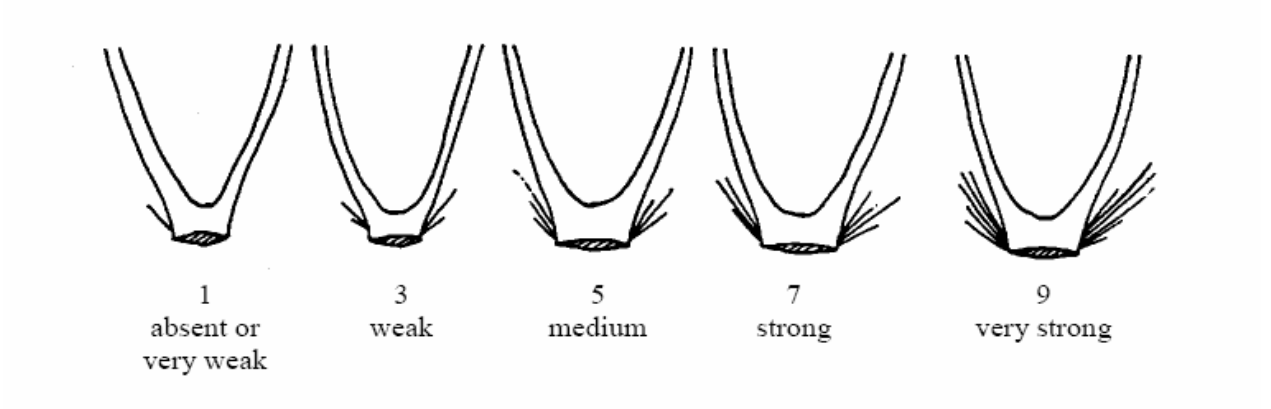
The strongest expression observed should be recorded.



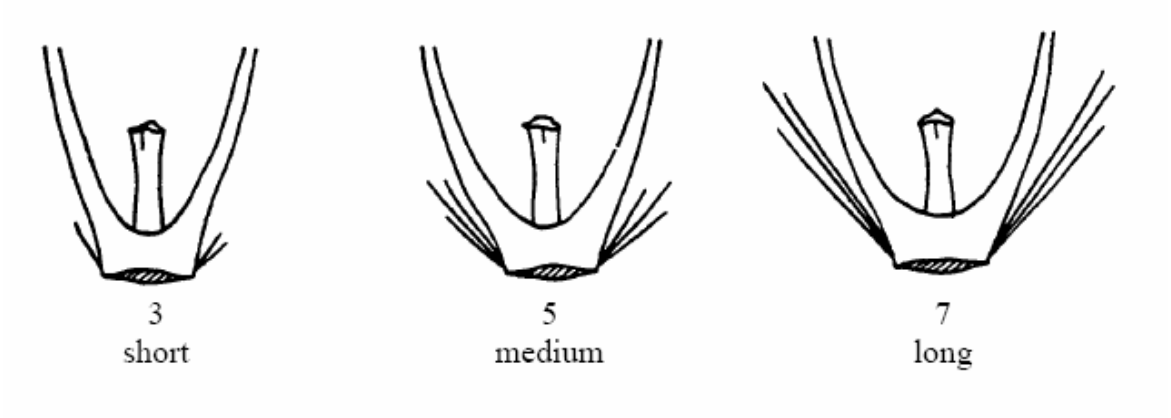
Ad. 11: Panicle: attitude of branches



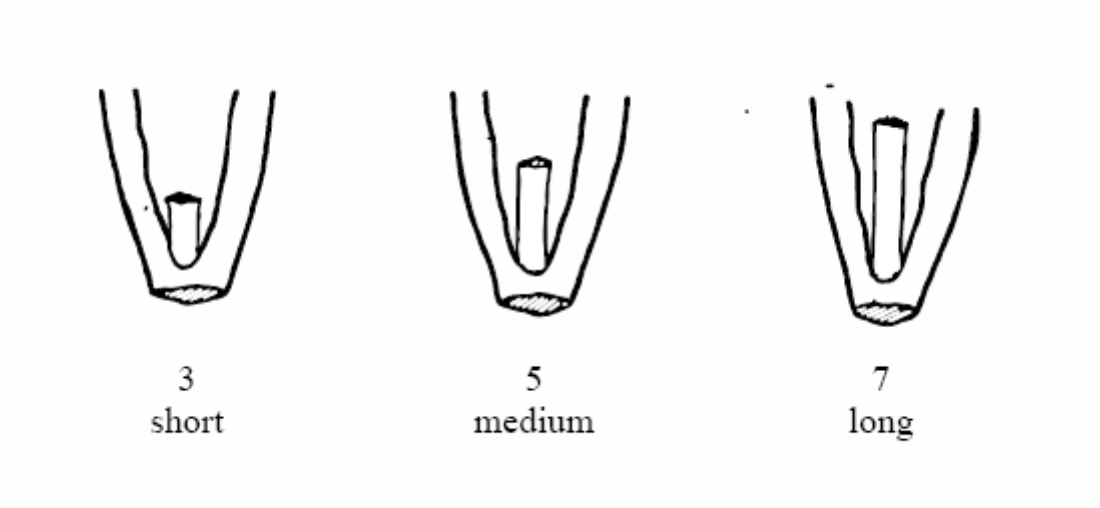
Ad. 19: Primary grain: hairiness of base



Ad. 20: Primary grain: length of basal hairs



Ad. 21: Primary grain: length of rachilla



Ad. 22: Seasonal type

The seasonal type (need of vernalization) should be assessed on plots sown in springtime. Example varieties should always be included in the trial. When the example varieties behave according to its description, candidate varieties can be described. At the time when the latest spring type variety is fully mature (stage 91/92 of the Zadoks decimal code) growth stage reached by the respective variety should be assessed. The states of expression are defined as follows:

Winter type (high need of vernalization): the plants have reached stage 45 of the Zadoks decimal code (boots swollen) at maximum.

Alternative type (partial need of vernalization): the plants have exceeded stage 45 of the Zadoks decimal code (as a rule they have exceeded stage 75) and have reached stage 90 at maximum.

Spring type (no need or very weak need of vernalization): the plants have exceeded stage 90 of the Zadoks decimal code.

8.2 *Growth stages*

Decimal code for of the growth stages of the Zadoks decimal code for cereals (Zadok et al., 1974)

2- digit Code	General description	Feekes'Scale	Additional remarks on Wheat; Barley; Rye; Oats and Rice
	Germination		
00	Dry seed		
01	Start of inhibition		
02	-		
03	Imbibition complete		
04	-		
05	Radicle emerged from caryopsis		
06	-		
07	Coleoptile emerged from caryopsis		
08	-		
09	Leaf just at coleoptile tip		
	Seedling growth		
10	First leaf through coleoptile	1 - Second leaf visible (less than 1 cm)	
11	First leaf unfolded (1)		
12	2 leaves unfolded	50% of laminae unfolded	
13	3 leaves unfolded		
14	4 leaves unfolded		
15	5 leaves unfolded		
16	6 leaves unfolded		
17	7 leaves unfolded		
18	8 leaves unfolded		
19	9 or more leaves unfolded		
	Tillering		
20	Main shoot only		
21	Main shoot and 1 tiller	2	This section to be used to supplement records from other sections of the table: "Concurrent codes".
22	Main shoot and 2 tillers		
23	Main shoot and 3 tillers		
24	Main shoot and 4 tillers		
25	Main shoot and 5 tillers	3	
26	Main shoot and 6 tillers		
27	Main shoot and 7 tillers		
28	Main shoot and 8 tillers		
29	Main shoot and 9 or more tillers		
	Stem elongation		
30	Pseudo stem erection (2)	4-5	In rice: vegetative lag phase
31	1st node detectable	6	Jointing stage
32	2nd node detectable	7	
33	3rd node detectable		Above crown nodes
34	4th node detectable		
35	5th node detectable		
36	6th node detectable		
37	Flag leaf just visible	8	
38	-	-	Pre-boot stage In rice: Opposite auricle
39	Flag leaf ligule / collar just visible	9	

2- digit Code	General description	Feekes'Scale		Additional remarks on Wheat; Barley; Rye; Oats and Rice
	Booting			
40	-			Little enlargement of the inflorescence; early-boot stage
41	Flag leaf sheath extending			
42	-			
43	Boots just visibly swollen			Mid-boot stage
44	-	10		
45	Boots swollen			Late-boot stage
46	-			
47	Flag leaf sheath opening			
48	-			
49	First awns visible		10.1	In awned forms only
	Inflorescence emergence			
50	First spikelet of inflorescence just visible	N		N = non-synchronous crops
51		S		
52	1/4 of inflorescence emerged	N	10.2	
53		S		S = synchronous crops
54	1/2 of inflorescence emerged	N	10.3	
55		S		
56	3/4 of inflorescence emerged	N	10.4	
57		S		
58	Emergence of inflorescence completed	N	10.5	
59		S		
	Anthesis			
60	Beginning of anthesis	N	10.51	Not easily detectable in barley. In rice: usually immediately following heading
61		S		
62	-			
63	-			
64	Anthesis half-way	N	10.52	
65		S		
66	-			
67	-			
68	Anthesis complete	N	10.53	
69		S		
	Milk development			
70	-			
71	Caryopsis watery ripe		10.54	
72	-			Increase in solids of liquid endosperm notable when crushing the caryopsis between fingers
73	Early milk			
74	-		11.1	
75	medium milk			
76	-			
77	Late milk			
78	-			
79	-			

2- digit Code	General description	Feekes'Scale	Additional remarks on Wheat; Barley; Rye; Oats and Rice
	Dough development		
80	-		
81	-		
82	-		
83	Early dough		
84	-		Fingernail impression not held
85	Soft dough	11.2	
86	-		Fingernail impression held; inflorescence losing chlorophyll
87	Hard dough		
88	-		
89	-		
	Ripening		
90	-		In rice: terminal spikelets ripened.
91	Caryopsis hard (difficult to divide by thumb-nail) (3)	11.3	
92	Caryopsis hard (can no longer be dented by thumb-nail) (4)	11.4	In rice: 50% of spikelets ripened
93	Caryopsis loosening in daytime		In rice: over 90% of spikelets ripened (5)
94	Over-ripe; straw dead and collapsing		
95	Seed dormant		Risk of grain loss by shedding
96	Viable seed giving 50% germination		
97	Seed not dormant		
98	Secondary dormancy induced		
99	Secondary dormancy lost		
	Transplanting and recovery (rice only)		
T1	Uprooting of seedlings		
T2	-		
T3	Rooting		
T4	-		
T5	-		
T6	-		
T7	Recovery of shoots		
T8	-		
T9	Resumption of vegetative growth		

Notes on the Table of the Decimal Code for the Growth Stages or Cereals

(1) Stage of seedling inoculation with rust in the greenhouse.

(2) Only applicable to cereals with a prostrate or semi-prostrate early growth habit.

(3) Ripeness for binder (ca. 16% water content). Chlorophyll of inflorescence largely lost.

(4) Ripeness for combine harvester (less than 16% water content).

(5) Optimum harvest time.

9. Literature

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

1.1.1	Botanical name	*Avena nuda* L.	[ ]
1.1.2	Common name	Naked Oats	
1.2.1	Botanical name	*Avena sativa* L.	[ ]
1.2.2	Common name	Oats	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#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)

(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]

(please state known parent variety(ies))

(……..……..…) x (……..……..…)

female parent male parent

(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)

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Other (please provide details) [ ]

4.2.2 Other [ ]
(Please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

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	**Seed: color of lemma**		
(1)			
	white	Firth (S), Gerald (W)	1 [ ]
	yellow	Canyon (S), Mascani (W)	2 [ ]
	brown	Prevision (W)	3 [ ]
	black	Calatrava (W)	4 [ ]
5.2	**Leaf blade: hairiness of margins**		
(4)			
	absent or very weak	Chimene (S), Ivory (S)	1 [ ]
	weak	Calatrava (W), Pergamon (S)	3 [ ]
	medium	Anchuela (W)	5 [ ]
	strong	Ombrone (W), Stella d'Oro (S)	7 [ ]
	very strong		9 [ ]
5.3	**Time of panicle emergence**		
(6)			
	very early	Rapidena (ALT)	1 [ ]
	early	Maestro (W), Stella d'Oro (S)	3 [ ]
	medium	Anchuela (W), Gabby (S), Ivory (S), Mascani (W)	5 [ ]
	late	Calatrava (W), Mason (W), Pergamon (S), SW Argyle (S)	7 [ ]
	very late	Balado (W)	9 [ ]
5.4	**Stem: hairiness of uppermost node**		
(7)			
	absent	Canyon (S), Gerald (W)	1 [ ]
	present	Mascani (W), Scorpion (S)	9 [ ]
5.5	**Stem: intensity of hairiness of uppermost node**		
(8)			
	very weak		1 [ ]
	weak	Anchuela (W)	3 [ ]
	medium	Flavia (W)	5 [ ]
	strong	Forridena (W)	7 [ ]
	very strong		9 [ ]

	Characteristics	Example Varieties	Note
5.6	**Glume: glaucosity**		
(10)			
	absent or very weak	Rapidena (ALT)	1 [ ]
	weak	Hendon (W)	3 [ ]
	medium	Atego (S)	5 [ ]
	strong	Belinda (S)	7 [ ]
	very strong	Odal (S)	9 [ ]
5.7	**Plant: length**		
(14)			
	very short	Balado (W), Hendon (W)	1 [ ]
	short	Fergus (W), Rapidena (ALT)	3 [ ]
	medium	Calatrava (W), Mascani (W)	5 [ ]
	long	Gerald (W), SW Argyle (S)	7 [ ]
	very long	Forridena (W)	9 [ ]
5.8	**Grain: husk**		
(16)			
	absent	Hendon (W), Lennon (S)	1 [ ]
	present	Canyon (S), Mascani (W)	9 [ ]
5.9	**Seasonal type**		
(22)			
	winter type	Calatrava (W), Mascani (W)	1 [ ]
	alternative type	Rapidena (ALT)	2 [ ]
	spring type	Stella d'Oro (S), SW Argyle (S)	3 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

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
Example			

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#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 Other information

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

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.

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]