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WORKING PAPER ON REVISED TEST GUIDELINES FOR RICE
(Oryza Sativa L.)

Document prepared by the experts from Spain

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Oryza sativa L.*: lines and hybrid varieties.

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of seed to be supplied by the applicant in one or several samples should be:

3 kg.

If requested, in the case of hybrids and interspecific hybrid varieties, an additional 1,5 kg. of seed of each component should be submitted. The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing certified seed in the country in which there application is made. The germination capacity should be as high as possible.

2. If requested by the competent authority, at least 100 panicles should also be submitted. The panicles should be well developed and not obviously affected by any pest or disease. They should contain a sufficient number of viable seeds to establish a satisfactory row of plants for observation.

3. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

1. The minimum duration of tests should normally be two similar growing periods.

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The field tests should be carried out under conditions ensuring normal growth. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include about 2,000 plants which should be divided between two or more replicates. If tests on ear-rows are conducted, at least 50 ear-rows should be observed. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. The characteristics described in Chapter VII should be used for the testing of distinctness of lines, and hybrid varieties.
2. All observations for the assessment of distinctness and stability should be made on at least 20 plants or parts taken from each of 20 plants.
3. For the assessment of uniformity population standard of 0.1% with an acceptance probability of 95% should be applied. In the case of 2000 plants the maximum number of 5 off-types allowed would be accepted.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.
2. It is recommended that the competent authorities use the following characteristics for grouping varieties:
 - (i) Penultimate leaf: anthocyanin coloration of auricles (char. 4)
 - (ii) Time of heading (50% of plants with heads) (char.6)
 - (iii) Stem: length (excluding panicle; excluding floating rice) (char. 12)
 - (iv) Decorticated grain: length (char. 28)

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.
2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of expression for each characteristic.

3. Legend:

(*) Characteristics that should be used on all varieties in every growing period over which examinations are made and always be included in the variety descriptions. except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.

(+) See Explanations on the Table of Characteristics in chapter VIII.

¹⁾ The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column. The stages of development denoted by each number are described at the end of chapter VIII.

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

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. 40	Leaf color					
	pale green				Lemont, Baldo	3
	medium green				Bahia	5
	dark green				Puntal, Arborio	7
2. 40	Leaf: distribution of anthocyanin					
	absent				Bahia, Thaibonnet	1
	on tips					2
	on margins					3
	in blotches					4
	uniform					5
3. 40	Penultimate leaf: pubescence of blade					
	absent				Thaibonnet	1
	weak				Bahia, Senia	3
	medium					5
	strong					7
	very strong					9
4. 40	Penultimate leaf: anthocyanin coloration of auricles					
	absent				Senia, Balilla	1
	present				Arborio, Vialone Nano	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. 50 (+)	Flag leaf: attitude of blade					
	erect				Elio	1
	semierect				Senio, Bahio, Selenio	3
	horizontal				Baldo	5
	reflex				Arborio	7
6. 55 (*)	Time of heading (50% of plants with heads)					
	very early				Loto	1
	early				Albada, Cripto	3
	medium				Bahia, Ariete	5
	late				Puntal, Bomba	7
	very late				Gulfmont	9
7. 65	Lemma: anthocyanin coloration of keel					
	absent or very weak				Ariete, Balilla	1
	weak					3
	medium					5
	strong				Arborio, Carnaroli	7
	very strong					9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. 65	Lemma: anthocyanin coloration of area below apex					
	absent or very weak				Ariete, Balilla	1
	weak					3
	medium					5
	strong				Arborio, Carnaroli	7
	very strong					9
9. 65 (*)	Lemma: anthocyanin coloration apex					
	absent or very weak				Bomba, Ariete	1
	weak				Thaibonnet	3
	medium				Cripto	5
	strong				Elio, Puntal	7
	very strong				Arborio	9
10 65 (*)	Spikelet: color of stigma					
	white				Bahia, Ariete	1
	light green					2
	yellow				Lido	3
	light purple				Thaibonnet	4
	purple				Vialone Nano	5
11. 65	Stem: thickness					
	thin				Lido	3
	medium				Senia, Naldo	5
	thick				Arborio, Roncolo	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12. 70 (*)	Stem: Length (excluding panicle; excluding Floating rice)					
	very short				Leda, Lampo	1
	short				Loto, Thaibonnet	3
	medium				Bahia, Ariete	5
	long				Arborio, Baldo	7
	very long				Carnaroli	9
13. 70 (*)	Stem: anthocyanin coloration of nodes					
	absent				Senia, Thaibonnet, Ariete	1
	present				Arborio, Vailone Nano	9
14. 70	Stem: intensity of anthocianin or coloration of nodes					
	weak					3
	medium					5
	strong					7
15. 70	Stem: anthocyanin coloration of internodes					
	absent				Ariete	1
	present				Arborio, Vialone Nano	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. 72 (*)	Panicle: curvature of main axis					
	short				Lido Ariete	3
	medium				Thaibonnet, Thainato	5
	long				Lemont, Carnaroli	7
17. 90 (*) (+)	Panicle: curvature of main axis					
	erect				Elio, Roncolo	1
	semi-erect				Lido, Ariete	3
	drooping				Guadiamar, Thaibonnet	5
	deflexed				Galatxo, Vailone Nano	7
18. 60 (*) 80	Spikelet: color of tip of lemma					
	absent/very weak				Puntal, Thaibonnet	1
	weak				Guadiamar, Thaibonnet	3
	medium				Galatxo, Vialone Nano	5
	strong				Calca, Bomba, S. Andrea	7
	very strong					9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19. 80 90	Spikelet color of tip of lemma					
	white				Lido	1
	yellowish				Senia	2
	brown				Lemont, Arborio	3
	red					4
	purple				Thaibonnet, Vialone	5
	black					6
20. 90 (*)	Panicle: length of longest awns					
	absent/very short				Calca, Thaibonnet, Balilla	1
	short				Senia, Arborio, Loto	3
	medium				Bomba, Selenio	5
	long				Ribe	7
	very long				Carnaroli	9
21. 90 (*)	Panicle: distribution of awns					
	tip only					1
	upper half				Selenio, Arborio	3
	whole length				Carnaroli	5
22. 90 (*) (+)	Panicle: compactness					
	open				Thainato, Arborio	3
	intermediate				Lido, Ariete	5
	compact				Bahia, Elio	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. 90 (+)	Panicle: exsertion					
	partly exserted				Puntal, Lampo	3
	exserted				Mareny, Arborio	5
	well exserted				Senia, Vialone Nano	7
24. 90	Time of maturity					
	very early				Loto	1
	early				Cripto, Lido	3
	medium				Bahia, Ariete	5
	late				Roma, Bahia	7
	very late				Skybonnet, Thaibonnet	9
25. 92	Grain: weight of 1000 fully developed grain					
	very low				Lido	1
	low				Gulfmont	3
	medium				Thaibonnet, Ariete	5
	high				Bahia, Roma	7
	very high				Arborio	9
26. 92	Grain: length					
	very short				Balilla	1
	short				Bomba, Lido	3
	medium				Tebre, Albada, Ariete	5
	long				Thaibonnet, Arborio	7
	very long				Thaibonnet	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27. 92	Grain: width					
	very narrow					1
	narrow				Thaibonnet	3
	medium				Thaiparla, Veta	5
	broad				Arborio	7
	very broad					9
28. 92 (*)	Decorticated grain: length					
	short				Bomba, Balilla	3
	medium				Bahia, Lido	5
	long				Puntal, Thaibonnet	7
29. 92	Decorticated grain: width					
	narrow				Lido, Thaibonnet	3
	medium				Thainato	5
	broad				Bomba, Senia, Arborio	7
30. 92 (*)	Decorticated grain: shape (in lateral view) length/width					
	round(<1.5)				Otome-Mochi, Nourrin 33	1
	semi-round (1.5-1.99)				Kosihikari, Bahia	2
	(2.00-2.49)				Habataki, Lido	3
	spindle-shaped (2.5-3.00)				Sarry-Queen, Ariete	4
	very spindle-shaped (>3.0)				Thaibonnet	5

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estado ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31. 92	Decorticated grain: color					
	white				Bahia, Senia	1
	light brown					2
	variegated brown					3
	dark brown					4
	red					5
	purple					6
32. 90	Polished grain: size of white core					
	absent/very small				Guadiamar, Thaibonnet	1
	small				Thinato, Balilla	3
	medium				Senia, Carnaroli	5
	large				S. Andrea	7
	very large				Vialone Nano	9
33. 92 (+)	Endosperm: type (amylose content)					
	non glutinous (>15%)				Koshihikari Akitakomachi	1
	intermediate (5.0-1.50%)				Milky-Queen, Aya	2
	glutinous (<5%)				Mangetsu-Mochi Ital-Mochi	3
34. 92	Aroma					
	absent				Bahia, Thaibonnet	1
	present				Gange, Urumati, Arome	9

VIII. Explanations of the Table of Characteristics

Ad.5: Flag leaf: attitude of blade

1
erect

3
semierect

5
horizontal

7
reflexed

Ad. 17: Panicle: curvature of main axis

panicle base

panicle
base

panicle base

panicle base

1
erect

3
semierect

5
drooping

7
deflexed

Ad. 22: Panicle: compactness

3
open

5
intermediate

7
compact

Ad. 23: Panicle: Exertion

panicle base

panicle
base

panicle
base

3
partly exerted

5
exerted

7
well exerted

Ad. 33:

Endosperm type (amylose content)

Method ISO 6647 must be used.

Decimal Code for the Growth Stages of Cereals*

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
<u>Germination</u>			
00	Dry seed		
01	Start of imbibition		
02	-		
03	Imbibition complete		
04	-		
05	Radicle emerged from caryopsis		
06	-		
07	Coleoptile emerged from caryopsis		
08	-		
09	Leaf just at coleoptile tip		
<u>Seedling growth</u>			
10	First leaf through coleoptile	} } 1	Second leaf visible (less than 1 cm)
11	First leaf unfolded(1)	} }	
12	2 leaves unfolded		} }
13	3 leaves unfolded		} }
14	4 leaves unfolded		} }
15	5 leaves unfolded		} } 50% of laminae unfolded
16	6 leaves unfolded		} }
17	7 leaves unfolded		} }
18	8 leaves unfolded		} }
19	9 or more leaves unfolded		} }

* Reproduced from EUCARPIA Bulletin No. 7, 1974, pages 49 - 52, with the kind permission of the authors. For further information, see J.C. Zadoks, T.T. Chang and C.F. Konzak, EUCARPIA Bulletin No 7, 1974, pages 42 - 52.

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
<u>Germination</u>			
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		
26	Main shoot and 6 tillers	3	
27	Main shoot and 7 tillers		
28	Main shoot and 8 tillers		
29	Main shoot and 9 or more tillers		
<u>Stem elongation</u>			
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	-		
39	Flag leaf ligule/collar just visible	9	Pre-boot stage In rice: opposite auricle stage

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
	<u>Booting</u>		
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
	<u>Inflorescence emergence</u>	}	
50	{ First spikelet of	{ N	N = non-synchronous crops
	{ inflorescence just	{	
51	{ visible	{ S	S = synchronous crops
52	{	{ N	
	{ ¼ of inflorescence emerged	{ 10.2	
53	{	{ S	
54	{	{ N	
	{ ½ of inflorescence emerged	{ 10.3	
55	{	{ S	
56	{	{ N	
	{ ¾ of inflorescence emerged	{ 10.4	
57	{	{ S	
58	{	{ N	
	{ Emergence of inflorescence	{ 10.5	
59	{ completed	{ S	

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice	
<u>Anthesis</u>				
60	} Beginning of anthesis	} N	Not easily detectable in barley. In rice: Usually immediately following heading	
61		} S		
62	-			
63	-			
64	} Anthesis half-way	} N		
65		} S		
66	-			
67	-			
68	} Anthesis complete	} N		
69		} S		
<u>Milk development</u>				
70	-			
71	Caryopsis watery ripe	10.54		
72	-			
73	Early milk	}		
74	-	}		
75	Medium milk	}	} Increase in solids of liquid endosperm } notable when crushing the caryopsis } between fingers	
76	-	}		
77	Late milk	}		
78	-			
79	-			
<u>Dough development</u>				
80	-			
81	-			
82	-			
83	Early dough	}		

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

Notes on the Table

- (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 (< 16% water content).
- (5) Optimum harvest time.

IX. Literature

No specific literature.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>	
1. Species	<p><i>Trifolium pratense L.</i> RED CLOVER</p>
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Type of material

(i) inbred line

- male sterile line []

- male fertile line []

(ii) hybrid []

(iii) other (please indicate) []

.....

4.2 Formula (if applicable, for each component in separate sheets, the information according to the following chapters 5 to 7 to be added)

Single hybrid

- female parental line

- male parental line

N.B. In case of use of male sterility system, indicate the name of the maintainer line of the female parental line.

4.3 Genetic origin and breeding method

4.4 Other information on genetic origin and breeding method.

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the state of expression which best corresponds).

Characteristics	Example Varieties	Note
5.1 Ploidy (2)		
diploid	Renova	2
tetraploid	Titus	4
5.2 Time of flowering (10)		
very early	Lipiero, Wiro	1
early	Renova, Formica	3
medium	Marino, Barfiola	5
late	Lucrum, Markus	7
very late	Kora, Björn	9
5.3 Stem: length (11)		
very short	Wiro	1
short	Renova	3
medium	Tempus	5
long	Markus	7
very long		9
5.4 Leaf: length of medial leaflet (16)		
short	Wiro	3
medium	Renova	5
long	Tedi	7

Characteristics		Example Varieties	Note
5.5	Leaf: width of medial leaflet		
(17)			
	narrow	Wiro	3
	medium	Merviot	5
	broad	Rotra	7
6. Similar varieties and differences from these varieties			
Denomination of similar variety	Characteristic in which the similar variety is different ^{o)}	State of expression of similar variety	State of expression of candidate variety
^{o)} In the case of identical states of expressions of both varieties, please indicate the size of the difference.			

