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TG/5/7

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

UNION INTERNATIONALE POUR LA PROTECTION DES OBTENTIONS VÉGÉTALES

INTERNATIONALER VERBAND ZUM SCHUTZ VON PFLANZEN-ZÜCHTUNGEN

UNIÓN INTERNACIONAL PARA LA PROTECCIÓN DE LAS OBTENCIONES VEGETALES

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

RED CLOVER

(*Trifolium pratense* L.)

GENEVA
2001

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TG/5/7
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These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

TABLE OF CONTENTS PAGE

I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Trifolium pratense* L.

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:

1.0 kg.

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 the application is made. The germination capacity should be as high as possible.

2. 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 independent growing cycles.

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. As a minimum, each test at each testing place should include per growing period:

(a) Row plots

3000 plants (density about 450 plants per m^2) which should be divided between two replicates

(b) Plots with single spaced plants

60 single spaced plants which should be divided between three replicates.

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. Unless otherwise stated, all observations for assessment of distinctness, uniformity and stability should be made:

- on 60 plants or parts of each of the 60 plants in case of single spaced plants
- on a minimum of 1500 plants in case of row plots.

The variability within the variety should not exceed the variability of comparable varieties already known.

2. Interpretation of results should be made according to the rule of cross-pollinated varieties as stated in the General Introduction to the Test Guidelines.

3. All measurements on the leaf should be made within 1 to 2 weeks after the mean date of flowering on the third leaf of the main stem from the top.

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:

Ploidy (characteristic 2).

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)] To be observed on A = spaced plants
B = row plots
C = special tests

MS = measurements 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 observations of a number of individual plants or parts of plants.

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

	Plot[1)] Parcelle[1)] Parzelle[1)] Parcela[1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**C**	**Seed: color of coat**	**Semence: couleur du tégument**	**Samen: Farbe der Schale**	**Semilla: color del tegumento**		
		yellow	jaune	gelb	amarillo	Marino	1
		violet	violet	violett	violeta		2
		multicolored	multicolore	mehrfarbig	multicolor	Renova	3
2. **(*)** **(+)**	**C**	**Ploidy**	**Ploïdie**	**Ploidie**	**Ploidía**		
		diploid	diploïde	diploid	diploide	Renova	2
		tetraploid	tétraploïde	tetraploid	tetraploide	Titus	4
3. **(+)**	**C** **MS**	**Cotyledon: length**	**Cotylédon: longueur**	**Keimblatt: Länge**	**Cotiledón: longitud**		
		short	court	kurz	corta	Wiro	3
		medium	moyen	mittel	media	Marino, Temara	5
		long	long	lang	larga	Maneta, Maro	7
4. **(+)**	**C** **MS**	**Cotyledon: width**	**Cotylédon: largeur**	**Keimblatt: Breite**	**Cotiledón: anchura**		
		narrow	étroit	schmal	estrecha	Wiro	3
		medium	moyen	mittel	media	Marino, Temara	5
		broad	large	breit	ancha	Maneta, Maro	7
5. **(*)** **(+)**	**B** **VG**	**Plant: natural height in the year of sowing**	**Plante: hauteur naturelle, l'année du semis**	**Pflanze: natürliche Höhe im Aussaat-jahr**	**Planta: altura en el año de la siembra**		
		short	basse	niedrig	baja		3
		medium	moyenne	mittel	media	Marino	5
		tall	haute	hoch	alta	Formica	7

	Plot[1)] Parcelle[1)] Parzelle[1)] Parcela[1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. (*) (+)	**B VG**	**Leaf: color in the year of sowing**	**Feuille: couleur, l'année du semis**	**Blatt: Farbe im Aussaatjahr**	**Hoja: color en el año de la siembra**		
		light green	vert pâle	hellgrün	verde claro		3
		medium green	vert moyen	mittelgrün	verde medio	Rotra	5
		dark green	vert foncé	dunkelgrün	verde oscuro	Tedi	7
7. (+)	**A VS**	**Plant: growth habit in autumn of year of sowing**	**Plante: port à l'automne de l'année du semis**	**Pflanze: Wuchsform im Herbst des Aussaatjahrs**	**Planta: hábito de crecimiento en otoño del año de siembra**		
		erect	dressé	aufrecht	erecto		1
		semi-erect	demi-dressé	halbaufrecht	semierecto		3
		intermediate	moyen	mittel	intermedio	Barfiola, Rotra	5
		semi-prostrate	demi-étalé	halbliegend	semipostrado		7
		prostrate	étalé	liegend	postrado	Lipiero, Wiro	9
8.	**B VG**	**Plant: tendency to flower in the year of sowing**	**Plante: tendance à la floraison, l'année du semis**	**Pflanze: Neigung zur Blüte im Aussaatjahr**	**Planta: tendencia a floración en el año de siembra**		
		weak	faible	gering	débil	Kora	3
		medium	moyenne	mittel	media	Sara, Vivi	5
		strong	forte	stark	fuerte	Barfiola	7
9. (*)	**B VG**	**Plant: natural height in spring**	**Plante: hauteur naturelle au printemps**	**Pflanze: natürliche Höhe im Frühjahr**	**Planta: altura en primavera**		
		short	basse	niedrig	baja	Wiro	3
		medium	moyenne	mittel	media	Silva	5
		tall	haute	hoch	alta	Tedi	7
10. (*)	**B VG**	**Leaf: intensity of green color in spring**	**Feuille: intensité de la couleur verte au printemps**	**Blatt: Intensität der Grünfärbung im Frühjahr**	**Hoja: intensidad del color verde en primavera**		
		light	claire	hell	clara		3
		medium	moyenne	mittel	media	Wiro	5
		dark	foncée	dunkel	oscura	Lucrum	7

	Plot[1)] Parcelle[1)] Parzelle[1)] Parcela[1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. (*) (+)	**A MS**	**Time of flowering**	**Époque de floraison**	**Zeitpunkt der Blüte**	**Época de la floración**		
		very early	très précoce	sehr früh	muy precoz	Lipiero, Wiro	1
		early	précoce	früh	precoz	Formica, Renova	3
		medium	moyenne	mittel	media	Barfiola, Marino	5
		late	tardive	spät	tardía	Lucrum, Markus	7
		very late	très tardive	sehr spät	muy tardía	Björn, Kora	9
12. (*) (+)	**A MS**	**Stem: length**	**Tige: longueur**	**Stengel: Länge**	**Tallo: longitud**		
		very short	très courte	sehr kurz	muy corta	Wiro	1
		short	courte	kurz	corta	Renova	3
		medium	moyenne	mittel	media	Tempus	5
		long	longue	lang	larga	Markus	7
		very long	très longue	sehr lang	muy larga		9
13. (+)	**A MS**	**Stem: thickness**	**Tige: épaisseur**	**Stengel: Dicke**	**Tallo: grosor**		
		thin	mince	dünn	delgado		3
		medium	moyenne	mittel	medio	Noe	5
		thick	épaisse	dick	grueso		7
14. (*) (+)	**A MS**	**Stem: number of internodes**	**Tige: nombre d'entre-nœuds**	**Stengel: Anzahl Internodien**	**Tallo: número de entrenudos**		
		low	petit	gering	pequeño		3
		medium	moyen	mittel	medio		5
		high	elevé	groß	alto	Titus	7

	Plot[1)] Parcelle[1)] Parzelle[1)] Parcela[1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15. (+)	**A VS**	**Stem: density of hairs**	**Tige: densité de la pilosité**	**Stengel: Dichte der Behaarung**	**Tallo: densidad de la pilosidad**		
		very low	très faible	sehr gering	muy baja		1
		low	faible	gering	baja	Lucrum	3
		medium	moyenne	mittel	media		5
		high	élevée	stark	alta		7
		very high	très élevée	sehr stark	muy alta		9
16. (*) (+)	**A VS**	**Leaf: shape of medial leaflet**	**Feuille: forme de la foliole médiane**	**Blatt: Form des mittleren Fieder-blattes**	**Hoja: forma del folíolo central**		
		elongated	allongée	länglich	alargada		1
		ovate	ovale	eiförmig	oval	Tempus	2
		rounded	arrondie	abgerundet	redondeada		3
17. (*)	**A MS**	**Leaf: length of medial leaflet**	**Feuille: longueur de la foliole médiane**	**Blatt: Länge des mittleren Fieder-blattes**	**Hoja: longitud del folíolo central**		
		short	courte	kurz	corta		3
		medium	moyenne	mittel	media		5
		long	longue	lang	larga		7
18. (*)	**A MS**	**Leaf: width of medial leaflet**	**Feuille: largeur de la foliole médiane**	**Blatt: Breite des mittleren Fieder-blattes**	**Hoja: anchura del folíolo central**		
		narrow	étroite	schmal	estrecha	Wiro	3
		medium	moyenne	mittel	media	Merviot	5
		broad	large	breit	ancha	Rotra	7

	Plot[1)] Parcelle[1)] Parzelle[1)] Parcela[1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19. (*) (+)	**A VS**	**Leaf: intensity of white marks**	**Feuille: intensité des marques foliares blanches**	**Blatt: Intensität der weißen Zeichnung**	**Hoja: intensidad da las marcas blancas**		
		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil		3
		medium	moyenne	mittel	media	Lucrum	5
		strong	forte	stark	fuerte	Temara	7
		very strong	très forte	sehr stark	muy fuerte		9
20. (+)	**B VG**	**Plant: natural height in aftermath**	**Plante: hauteur naturelle de la repousse après coupe**	**Pflanze: natürliche Höhe nach dem Schnitt**	**Planta: altura en el periodo siguiente al corte**		
		short	basse	niedrig	baja	Lipiero	3
		medium	moyenne	mittel	media	Markus	5
		high	haute	hoch	alta	Formica	7

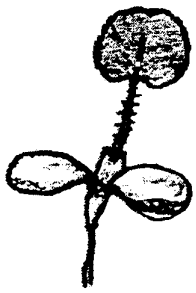
VIII. Explanations on the Table of Characteristics

Ad. 2: Ploidy

Ploidy should be assessed on at least 100 seedlings.

Ad. 3 and 4: Cotyledon: length (3), width (4)

The observation should be made 12-14 days after sowing in greenhouse, when the first leaf is fully developed. If the two cotyledons differ in size, the biggest one should be measured.

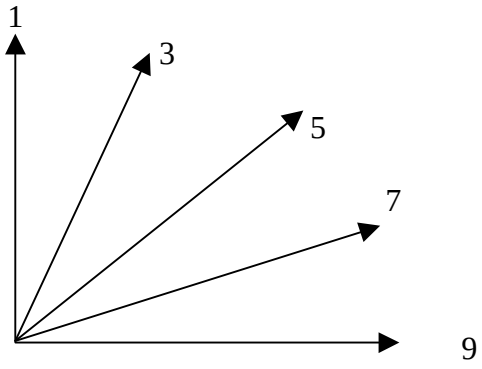


Ad. 5 and 6: Plant: natural height in the year of sowing (5); Leaf: color in the year of sowing (6)

The observation should be made 4 to 5 weeks after the reduction cut.

Ad. 7: Plant: growth habit in autumn of year of sowing

A visual estimate is taken of the angle that the outer shoots make with the horizontal.



1 = erect

3 = semi-erect

5 = intermediate

7 = semi-prostrate

9 = prostrate

Ad. 11: Time of flowering

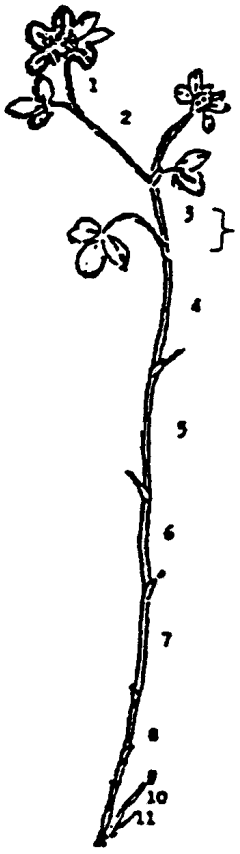
The observation should be made when 3 heads per plant are flowering.

Ad. 12, 13 and 14: Stem: length (12), thickness (13), number of internodes (14)

The longest stem should be observed including the head within 1-2 weeks after mean date of flowering. The thickness should be measured 2 to 4 cm above tillering node.

Ad. 15: Stem: density of hairs

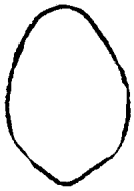
The density of hairs should be observed on the 3rd internode of a fully expanded flower head on the same stem on which the length of stem is measured.



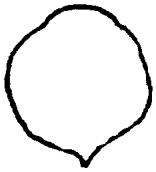
The observation should be made on this internode.

Ad. 16: Leaf: shape of medial leaflet

1
elongated



2
ovate



3
rounded

Ad. 19: Leaf: intensity of white marks

The observation should be made at beginning of flowering on the upper third of the plant.

Ad. 20: Plant: natural height in aftermath

The observation should be made within 4 to 6 weeks after the summer cut.

IX. Literature

Taylor, N.L., 1985: "Clover science and technology," Agronomy nr. 25 in the series American Society of Agronomy, Inc., Crop Science Society.

Taylor, N.L. and Quesenberry, K.H., 1996: Red Clover Science, Kluwer Academic Publishers, 228 pp.

Mousset-Déclas, C., 1992: Le Trèfle Violet. In "Amélioration des espèces végétales cultivées, objectif et critères de sélection," ed. Gallais et Bannerot, INRA ed., pp.339-348.

Mousset-Déclas, C., 1995: Les trèfles ou le genre Trifolium. In "Ressources génétiques des plantes fourragères et à gazon. Prosperi, Guy, Balfourier Coord. Coéd. BRG-INRA, pp. 177-211.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Species	*Trifolium pratense* L. RED CLOVER
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety (number of components and generation, origin etc.)

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 (2)	**Ploidy**		
	diploid	Renova	2 [ ]
	tetraploid	Titus	4 [ ]
5.2 (11)	**Time of flowering**		
	very early	Lipiero, Wiro	1 [ ]
	early	Formica, Renova	3 [ ]
	medium	Barfiola, Marino	5 [ ]
	late	Lucrum, Markus	7 [ ]
	very late	Björn, Kora	9 [ ]
5.3 (12)	**Stem: length**		
	very short	Wiro	1[ ]
	short	Renova	3[ ]
	medium	Tempus	5[ ]
	long	Markus	7[ ]
	very long		9[ ]
5.4 (17)	**Leaf: length of medial leaflet**		
	short		3[ ]
	medium		5[ ]
	long		7[ ]

	Characteristics	Example Varieties	Note
5.5 (18)	**Leaf: width of medial leaflet**		
	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.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pest and diseases

7.2 Special conditions for the examination of the variety

7.3 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 that question is yes, please attach a copy of such an authorization.

[End of document]