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TWA/31/5
ORIGINAL: English
DATE: September 10, 2002

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

Thirty-First Session
Rio de Janeiro, Brazil, September 23 to 27, 2002

DRAFT TEST GUIDELINES FOR LUPINS
DOCUMENT TG/66/4(PROJ.1)

Document prepared by experts from South Africa

The attached document TG/66/4(proj.1) already incorporates the standard wording of document TGP/7.2, which was adopted by the Technical Committee at its thirty-eighth session in April 2002, and includes some additional standard wording from document TGP/7.1 Draft 1, also agreed at that session.

[Document TG/66/4(proj.1)follows]

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TG/66/4(proj.1)
ORIGINAL: English
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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

WHITE LUPIN [*]
(Lupinus albus* L.*),

BLUE LUPIN
(*Lupinus angustifolius* L.*). and*

YELLOW LUPIN
(*Lupinus luteus* L*).*[*]

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:[*]

Latin	English	French	German	Spanish
Lupinus albus L.	White Lupin	Lupin blanc	Weißlupine	Altramuz blanco
Lupinus angustifolius L.	Blue Lupin	Lupin bleu	Blaue Lupine	Altramuz azul
Lupinus luteus L.	Yellow Lupin	Lupin jaune	Gelbe Lupine	Altramuz amarillo

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" (hereinafter referred to as 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.]

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1. Subject of these Guidelines

1.1 These Test Guidelines apply to all varieties of of *Lupinus albus* L., *Lupinus angustifolius* L. and *Lupinus luteus* 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.

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

3 kg for *L. albus*
2,5 kg for *L. angustifolius* & *L. luteus*

2.4 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.

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

2.6 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 Duration of Tests

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

3.2 Testing Place

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be seen at that place, the variety may be tested at an additional place.

3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.1 Notes

Characteristics containing the following notes in the second column of the Table of Characteristics should be examined as indicated below:

a Grain: All observations on the grain should be made on grain of fully mature pods.

3.3.2 Type of observation

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

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
C: special test

3.4 Test Design

3.4.1 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.

3.4.2 Each test should be designed to result in a total of, at least 200 plants, which should be divided between two or more replicates.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations determined by measuring or counting should be made on 30 plants or parts taken from each of 30 plants.

3.6 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

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 acceptable number of off-types tolerated in a sample size of 200 is 5 on the basis of a population standard of 1 % and an acceptance probability of 95%.

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 or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness is 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) Grain: bitter principle (characteristic 1)
(b) Flower: color of wings (characteristic 11)
(c) Plant: growth type (characteristic 13)

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:

Lal: *Lupinus albus*
Lan: *Lupinus angustifolius*
Llu: *Lupinus luteus*

6.5 Legend

(*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3
(QN) Quantitative characteristic – see Section 6.3
(PQ) Pseudo-Qualitative characteristic – see Section 6.3

(+) See Explanations on the Table of Characteristics in Chapter 8.

MS
VG } Type of observation – see Section 3.3.2
VS
C

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

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (*) (+)	**C VS**	**Grain: bitter principle**					
		absent					1
		present					9
2.	**VG**	**Plant: height three weeks after seedling emergence**					
		short					3
		medium					5
		tall					7
3. (*) (+)	**VG**	**Plant: growth habit at flower bud stage**					
		upright					1
		semi-upright					3
		intermediate					5
		spreading					7
		prostrate					9
4. (*)	**VG**	**Leaf: green color at flower bud stage**					
		light					3
		medium					5
		dark					7

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. (*)	**VG**	**Stem: anthocyanin coloration at flower bud stage**					
		absent or very weak					1
		weak					3
		medium					5
		strong					7
		very strong					9
6. (*)	**MG**	**Plant: height at beginning of flowering**					
		short					3
		medium					5
		tall					7
7.	**MG**	**Plant: height of insertion of 1st inflorescence at green ripening (from ground level to insertion of 1st inflorescence)**					
		very low					1
		low					3
		medium					5
		high					7
		very high					9

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. (*) (+)	**MG**	**Plant: height at green ripening stage**					
		very short					1
		short					3
		medium					5
		tall					7
		very tall					9
9. (*) (+)	**MS**	**Central leaflet: length**					
		very short					1
		short					3
		medium					5
		long					7
		very long					9
10.	**MS**	**Central leaflet: width**					
		very narrow					1
		narrow					3
		medium					5
		broad					7
		very broad					9

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. (*) (+)	**VG**	**Flower: color of wings**					
		white					1
		bluish white					2
		blue					3
		violet					4
		pink					5
		light yellow					6
		medium yellow					7
		dark yellow					8
		orange					9
12. (*)	**VG**	**Flower: color of tip of carina**					
		yellow					1
		red purple					2
		blue black					3
13. (*) (+)	**VG**	**Plant: growth type**					
		determinate					1
		indeterminate					2
14. (+)	**MS**	**Pod: length**					
		short					3
		medium					5
		long					7

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15. **(*)** **(+)**	**VS** a	**Grain: ornamentation**					
		absent					1
		present					9
16.	**VS** a	**Grain: color of ornamentation**					
		beige					1
		brown					2
		grey					3
		black					4
		multicolored					5
17. **(+)**	**VS** a	**Grain: distribution of ornamentation**					
		total					1
		total with eyebrow					2
		dorsal					3
		ventral					4
		eyebrow					5
18. **(+)**	**VS** a	**Grain: density of ornamentation (excluding varieties with eyebrow only)**					
		very sparse					1
		sparse					3
		medium					5
		dense					7
		very dense					9

Char. No.	Method of Examination	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	**MG** a	**Grain: 100 seed weight (harvested seed)**					
		very low					1
		low					3
		medium					5
		high					7
		very high					9
20. (*) (+)	**VS VG**	**Time of beginning of flowering**					
		early					3
		medium					5
		late					7
21. (+)	**VG**	**Time of green ripening**					
		early					3
		medium					5
		late					7
22. (+)	**VG**	**Time of ripening**					
		early					3
		medium					5
		late					7

8. Explanations on the Table of Characteristics

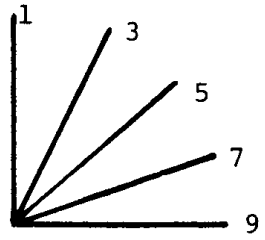
Ad. 1: Grain: bitter principle

The bitter principle should be assessed on the seed sent in for testing. The test should be restricted to the qualitative proof of bitter grains in the sample. The uniformity tolerance should be 1 grain in 100 grains. The Grain-Cut-Method after v. Sengbusch (1942), Ivanov and Smirnova (1932) and Eggebrecht (1949) is applicable as the testing method to *Lupinus albus*, *Lupinus angustifolius* and *Lupinus luteus*. The dry or swollen grains are cut transversely. The grain halves are dipped on a sieve for 10 seconds in an iodine solution and then rinsed for 5 seconds with water. The cut surfaces of the bitter grains discolor to brown but those of the grains low in alkaloids remain yellow.

For the preparation of the iodine solution 14g potassium iodate are dissolved in as little water as possible, 10g iodine is added and with water made up to 100cm^3. The solution has to be left for one week before it can be used. Storage in brown bottles. This main solution is diluted between 1 to 3 and 1 to 5 before being used.

Ad. 3: Plant: growth habit at flower bud stage

The growth habit should be assessed visually during flower bud stage from the attitude of the side branches. The angle formed by the outer side branches with an imaginary middle axis should be used. The states of expression should be determined as follows:



upright (1)

semi-upright (3)

intermediate (5)

spreading (7)

prostrate (9)

Ad. 8 & 21: Plant: height at green ripening stage (8) and Time of green ripening (21)

To assess the time of green ripening, the date should be recorded when the grains in the pods of the main shoot have reached full size and the grains in the pod can be dented with the thumbnail.

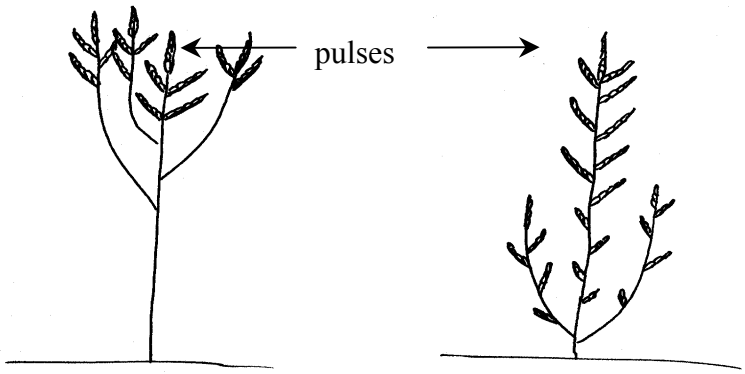
Ads. 9, 10: Terminal leaflet: length and width

All observations on the leaf should be made at the time of full flowering on the terminal leaflet of the leaf just below the uppermost branch carrying flowers.

Ads. 11, 12: Flower: color of wing and color of tip of carina

All observations on the flower should be made at the time of full flowering. Observations should be made on flowers at the stage of pollen release.

Ad. 13: Plant: growth type



2	1
indeterminate	determinate

Ad. 14: Pod: length

All observations should be made on pods at green maturity, in middle third of the main inflorescence.

Ad. 15: Grain: ornamentation

Ornamentation means well-defined dots different from the ground color. They should be assessed at full maturity of the grain.

Ad. 17: Grain: distribution of ornamentation

1
total

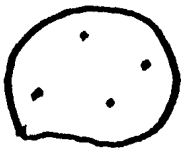
2
total with eyebrow

3
dorsal

4
ventral

5
eyebrow

Ad. 18: Grain: density of ornamentation



1
very weak

3
weak

5
medium

7
strong

9
very strong

Ad. 20: Time of beginning of flowering

A plant is considered to begin to flower when 3 flowers of the inflorescence on the main shoot are open. If observations are made on individual plants, the mean date for the plot has to be calculated. If observations are made on a group of plants, the date should be recorded when the flower buds on the main shoot of about 50% of the plants in the plot have begun to open.

Ad. 22: Time of ripening

To assess the time of ripening, the date should be recorded when the grains in the pods of the main shoot can no longer be dented with the thumbnail.

9. Literature

– Eggebrecht,H.: Methodenbuch Band V. Die Untersuchung von Saatgut, Radebeul und Berlin. 1949.

– IBPGR Secretariat: Lupin Descriptor, Rome 1981.

- Julier, B.: Etude génétique et physiologique de l'architecture déterminée chez le Lupin blanc d'hiver. Conséquences agronomiques et en sélection. Thése. 1994.

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	*Latin Name*	*Lupinus albus* L.
1.2	Common Name	WHITE LUPIN
1.3	*Latin Name*	*Lupinus angustifolius* L.
1.4	Common Name	BLUE LUPIN
1.5	*Latin Name*	*Lupinus luteus* L
1.6	Common Name	YELLOW LUPIN

2. Applicant

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

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

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

4.2 Method of Propagating the Variety

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 (1)	**Grain: bitter principle**		
	absent		1[ ]
	present		9[ ]
5.2 (5)	**Stem: anthocyanin coloration at flower bud stage**		
	absent or very weak		1[ ]
	weak		3[ ]
	medium		5[ ]
	strong		7[ ]
	very strong		9[ ]
5.3 (11)	**Flower: color of wings**		
	white		1[ ]
	bluish white		2[ ]
	blue		3[ ]
	violet		4[ ]
	pink		5[ ]
	light yellow		6[ ]
	medium yellow		7[ ]
	dark yellow		8[ ]
	orange		9[ ]
5.4 (13)	**Plant: growth type**		
	determinate		1[ ]
	indeterminate		2[ ]

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

	Characteristics	Example Varieties	Note
5.5 (20)	**Time of beginning of flowering (quote mean date of beginning of flowering of variety as well as of two well-known comparable varieties)** **…….** **……..**		

6. Similar varieties and differences from these varieties

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)	*Plant: height*	*e.g. note 3*	*note 7*
		e.g. short	*tall*
		e.g. 90 cm	*130 cm*

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?

7.1.1 Resistance to pest and diseases

Yes [ ] No [ ]

(If yes, please provide details)

7.1.2 Other

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

7.2.1 seasonal type

(i) spring type [ ]
(ii) winter type [ ]

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

Yes [ ] No [ ]

(If yes, please give details)

7.3 Other information

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

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. 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]