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WORKING PAPER ON TEST GUIDELINES FOR RUBBER
(*Heavea* Aubl.)

Document prepared by experts from New Zealand

I. Subject of these Guidelines

These Test Guidelines apply to all vegetatively propagated varieties of *Hevea* Aubl. of the family Euphorbiaceae.

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. As a minimum, the following quantity of plant material is recommended:

15 plants at the two whorl stage on rootstock.

Recommended rootstocks are seedlings of GT1, AVROS 2037 and LCB 1320.

2. It is recommended that the trial is planted in the wet season. If the trial is intended to grow adult trees, then a spacing of 4 m between trees in the row is necessary. A spacing of 1 m between trees in the row is acceptable for the growing of young plants if adult characteristics will be observed elsewhere.

3. The plant material supplied should be visibly healthy, not lacking in vigour or affected by any important pests or diseases. It should preferably not be obtained from *in vitro* propagation.

4. 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.

5. If the applicant submits distinguishing characteristics which can only be observed on adult trees, he should be able to indicate to the authorities at least seven adult trees of the variety on which these characteristics can be observed.

III. Conduct of Tests

1. A test should normally be conducted for two growing periods. If distinctness and/or uniformity cannot be sufficiently established in two growing periods, the test should be extended for a further growing period.

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

3. The 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 a total of 15 plants. 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 (e.g. chemical composition of latex) may be established.

IV. Methods and Observations

1. Unless otherwise stated, all observations determined by measurements should be made on 15 plants.

2. For the assessment of uniformity, a population standard of 1 percent and an acceptance probability of 95 percent should be applied. In the case of a sample size of 15 plants, the maximum number of off-types allowed would be one.

3. All observations on the leaflet should be made on central leaflets unless otherwise stated. Central leaflets should be taken from mature leaves from a central cluster (whorl) on the main stem.

4. All observations on the main stem should be made in the second year of test or on mature trees.

5. All observations on the bark should be made on the main stem.

6. All bark characters should refer only to bark that has not been used for tapping.

7. All observations on the branch should be made in the second year of test or on mature trees.

8. All observations on the crown and defoliation should be made on mature trees.

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:

(a) Leaflet blade: relative position to side leaflets.
(b) Leaflet blade: shape.
(c) Leaflet blade: shape relative to side leaflets.
(d) Leaflet blade: shape in cross section.
(e) Leaflet blade: intensity of green colour of upper side.
(f) Leaflet petiole: length.

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the the Table of Characteristics should be used.

2. Notes (1 to 9), 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.

VII Table of Characteristics

	Characteristic and State	Example Variety	Note
1. **(+)**	**Leaflet blade: attitude**		
	semi-erect		3
	horizontal	RRIC 100	5
	semi-drooping		7
2. **(*)** **(+)**	**Leaflet blade: relative position to side leaflets**		
	free	BPM 1	1
	partially overlapping	GT 1	2
	overlapping	PB 260	3
3.	**Leaflet blade: length**		
	short		3
	medium		5
	long		7
4.	**Leaflet blade: length relative to side leaflets**		
	shorter		1
	same	GT 1	2
	longer	PB 260	3
5.	**Leaflet blade: width**		
	narrow		3
	medium		5
	broad		7
6. **(*)** **(+)**	**Leaflet blade: shape**		
	lanceolate	RRIC 102	1
	broad lanceolate		2
	elliptic	BPM 1	3
	obovate	GT 1	4

7. (*) Leaflet blade: shape relative to side leaflets

similar	GT1	1
different	PB 260	2

8. (*) (+) Leaflet blade: shape in longitudinal section

straight	BPM 1	1
convex	GT 1	2
S shaped		3

9. (*) (+) Leaflet blade: shape in cross section

V-shaped	BPM 1	1
U shaped	RRIC 100	2
approximately straight	RRIC 101	3
convex		4

10. (*) Leaflet blade: intensity of green colour of upper side

light	BPM 1	3
medium	BPM 24	5
dark	GT 1	7

11. (*) Leaflet blade: glossiness of upper side

absent to very weak	BPM 24	1
weak		3
medium	GT 1	5
strong		7
very strong		9

12. Leaflet blade: thickness

thin		3
medium		5
thick		7

13. **(*)**	**Leaflet blade: roughness of surface (upper side)**		
	smooth	GT 1	3
	medium		5
	rough	RRIC 101	7
14.	**Leaflet blade: pubescence on veins on lower side**		
	absent		1
	present		9
15.	**Leaflet blade: intensity of pubescence on veins on lower side**		
	weak		3
	medium		5
	strong		7
16. **(*)**	**Leaflet blade: undulation of margin**		
	absent	BPM 24	1
	present	RRIC 100	9
17.	**Leaflet blade: degree of undulation of margin**		
	weak	PB 260	3
	medium		5
	strong		7
18. **(+)**	**Leaflet blade: shape of tip**		
	acuminate		1
	aristate	BPM 1	2
	cuspidate		3
19. **(*)** **(+)**	**Leaflet blade: shape of base**		
	attenuate	PB 260	1
	cuneate	GT 1	2
	attenuate	RRIC 102	3

20. (*)	**Leaflet petiole: length**		
	short	RRIC 100	3
	medium	GT 1	5
	long	BPM 24	7
21. (*)	**Leaflet petiole: attitude**		
	erect		1
	semi-erect		3
	horizontal	GT 1	5
22.	**Leaflet petioles: angle in between**		
	small		3
	medium		5
	large		7
23. (+)	**Leaf petiole: attitude**		
	semi-erect	RRIC 100	3
	horizontal		5
	semi-drooping		7
24.	**Leaf petiole: length**		
	short		3
	medium		5
	long		7
25. (*) (+)	**Leaf petiole: longitudinal shape**		
	concave		1
	straight	GT 1	2
	convex	TM6	3
	S shaped		4
26. (*) (+)	**Leaf cluster: shape of apex in lateral view**		
	acute (conical)	RRIC 102	1
	truncate		2
	regularly rounded	RRIC 100	3
	irregularly rounded		4

27. **(*)** **(+)**	**Leaf cluster: density**		
	sparse		3
	medium		5
	dense		7
28.	**Main stem: form**		
	straight	GT 1	3
	intermediate		5
	curved		7
29.	**Main stem: shape in cross section (lower third)**		
	round		1
	elliptic		2
	fluted		3
30.	**Main stem: diameter (lower third)**		
	small		3
	medium		5
	large		7
31. **(*)** **(+)**	**Main stem: length between leaf clusters**		
	short	GT 1	3
	medium		5
	long	TM 6	7
32. **(*)**	**Main stem: axillary buds**		
	sunken		1
	flat	PB 260	2
	protruding	BPM 1	3
33. **(*)**	**Main stem: shape of leaf scars**		
	elliptic	RRIC 102	1
	flattened elliptic	RRIC 100	2
	triangular	BPM 1	3
	flattened triangular	GT 1	4

34. **Bark: colour**

reddish		1
brown		2
grey		3

35. **Bark: surface**
(*)

smooth		1
flaky		2
bumpy	BPM 1	3
ridged		4

36. **Bark: thickness**
(*)

thin		3
medium	BPM 1	5
thick	AVROS 2037	7

37. **Bark: firmness**

soft		3
medium	AVROS 2037	5
firm		7

38. **Primary branch: shape**

straight		3
intermediate		5
curved		7

39. **Primary branch: angle between**
(*) **first 5 cm of branch and main stem**

small (very acute)		3
medium (acute)	GT 1	5
large (weakly acute to right angle)		7

40. **Primary branch: thickness**
(*)

thin	PB 260	3
medium	GT 1	5
thick		7

41. **Primary branch: surface**

smooth		3
medium		5
rough		7

42.	**Primary branches: number**		
	few		3
	medium		5
	many		7
43.	**Primary branches: number of self terminating branches**		
	few		3
	medium		5
	many		7
44.	**Primary branch: number of secondary branches**		
	few		3
	medium		5
	many		7
45. (*)	**Crown: size**		
	small		3
	medium	BPM 1	5
	large		7
46. (*)	**Crown: shape of apex**		
	obtuse	PB 260	1
	rounded		2
	acute	BPM 1	3
47. (*)	**Crown: density**		
	sparse		3
	medium	PB 260	5
	dense	PR 261	7
48.	**Crown: symmetry**		
	asymmetrical		1
	symmetrical	PB 260	2
49. (*)	**Latex: colour**		
	white	GT 1	1
	light yellow		2
	yellow		3

50. Tree: degree of defoliation

low		3
medium		5
high	GT 1	7

51. Time of defoliation

early	BPM 1	3
medium		5
late	GT 1	7

VIII. Explanations on the Table Characteristics

1. Leaflet blade: attitude

1 = semi-erect

2 = horizontal

3 = semi-drooping

2. Leaflet blade: relative position to side leaflets

1 = free

2 = partially overlapping

3 = overlapping

6. Leaflet blade: shape

1 = lanceolate 2 = broad lanceolate 3 = elliptic 4 = obovate

8. Leaflet blade: shape in longitudinal section

1 = straight 2 = convex 3 = S shape

9. Leaflet blade: shape in cross section

1 = V shaped 2 = U shaped 3 = approximately straight 4 = convex

18. Leaflet blade: shape of tip

1 = acuminate 2 = aristate 3 = cuspidate

19. Leaflet blade: shape of base

1 = attenuate 2 = cuneate 3 = obtuse

23. Leaf petiole: attitude

1 = semi-erect 2 = horizontal 3 = semi-drooping

25. Leaf petiole: longitudinal shape

1 = concave 2 = straight 3 = convex 4 = S shape

26. Leaf cluster: shape of apex in laterial view

1 = acute (conical) 2 = truncate

3 = regularly rounded 4 = irregularly rounded

27. Leaf cluster: density

1 = sparse 3 = medium 7 = dense

31. Main stem: length between leaf clusters

3 = short 5 = medium 7 = long

IX Literature

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