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RUBBER
PLANTING MATERIALS

APPROVED FOR 2006

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Though the planting material recommendation of the Rubber Board is based on multiclone concept, almost entire planting carried out particularly in small holdings in the traditional region is with clone RRII 105 due to its outstanding yield potential and tolerance to abnormal leaf fall disease. Monoclonal plantations in general are prone to the outbreak of epidemics and RRII 105 is prone to *Corynespora* leaf disease as manifested in the Karnataka region during the year 2000. Realizing the potential risk involved in monoclonal planting the Board from 1991 has been recommending planting of as many clones as practicable, out of a select list of desirable clones besides RRII 105. The clones recommended comprise of such desirable ones, based on the above considerations as well as data available on yield potential and secondary characters.

The approved cultivars are classified into three major categories:

Category I comprises clones approved for large scale planting. This consists of RRII 105 and PB 260 for the traditional rubber growing regions and RRIM 600 and GT 1 for the non-traditional rubber growing regions. The clones

RRIM 600 and GT 1 are no longer recommended for large-scale cultivation in the traditional regions because of high susceptibility to diseases caused by *Phytophthora* species in RRIM 600 and low initial yield in GT 1. Only 50% of the total area of any estate is recommended to be planted any one of the clones in Category I.

Category II consists of clones with consistent performance in this country over a long term in any one of the evaluation stages. It is recommended that three or more of these clones may be used to plant up to 50% of the total area of any estate.

Category III consists of clones on which there is only limited data from experimental planting and is recommended for only small scale planting not to exceed 15% of the total area in aggregate. These clones have exhibited good performance over a long period in small scale trials and / or over a short term in large scale trials in India or abroad. Hence, these are recommended for experimental planting only. Polyclonal seeds are also recommended for planting in marginal areas.

The cultivars under each category are listed below:

Category I	Clones RRII 105, PB 260, RRII 414 and RRII 430 (RRIM 600 and GT 1 in non-traditional areas).
Category II	Clones RRIM 600, GT 1, RRII 5, RRII 203, PB 28/59, PB 217, RRII 417 and RRII 422.
Category III	Clones RRII 50, RRII 51, RRII 52, RRII 118, RRII 176, RRII 208, RRII 300, RRII 429,

PR 107, PR 255, PR 261, PB 86, PB 5/51, PB 235, PB 255, PB 280, PB 311, PB 312, PB 314, PB 330, RRIM 605, RRIM 701, RRIM 703, RRIM 712, RRIC 100, RRIC 102, RRIC 130, KRS 163, IRCA 111, IRCA 130, SCATC 88-13, SCATC 93-114, Haiken 1, BPM 24 and Polyclonal seeds.

In addition, other promising clones approved by the Chairman, Rubber Board are also included.

It should be noted in particular that most of the modern high yielding clones are prone to tapping panel dryness when tapped under half spiral alternate daily system. It is, therefore, strongly recommended that all such clones be tapped at a lower intensity, say, on half spiral once in three days.

The Rubber Research Institute of India has a programme for evaluating experimental clones not yet released on commercial scale in grower's plots. Growers who are prepared to undertake the risk of experimentation are advised to contact the Director of Research for details.

SHORT NOTES ON CULTIVARS

1. RRII 105

A clone evolved by the Rubber Research Institute of India and currently enjoying maximum popularity in the country. Parents are Tjir1 and Gl 1. Trunk tall and the presence of more than one leader is observed in many trees. Branching good with strong unions, canopy dense, foliage

dark green, leaflets long and glossy. Wintering and refoliation are early and partial. Vigour before and after tapping average. Virgin bark and renewed bark thickness above average.

Yield is very good. The average yield obtained over the first 15 years of tapping in onfarm evaluation trials at two locations is 2210 kg/ha/yr. Latex is white and DRC high.

This clone has a fair degree of tolerance to abnormal leaf fall disease. Highly susceptible to pink disease. Incidence of powdery mildew is medium. Occurrence of tapping panel dryness high and therefore adherence to tapping under half spiral, once in three days system is essential. Free from serious wind damage, if branch development is kept balanced. Small growers should take special care to avoid excessive or unbalanced manuring which can accentuate tapping panel dryness and wind damages. Corrective pruning of unbalanced branches can reduce incidence of wind damage. The clone is susceptible to drought in terms of growth, hence not advisable for planting in drought prone areas. However, if it survives and establishes in such areas yield is not much affected.

2. PB 260

A hybrid clone developed by the Prang Besar Estates Ltd. in Malaysia. Parents are PB 5/51 and PB 49. Trees have tall and straight trunk. Branching light and balanced with strong union. Canopy dense, foliage pale green. Vigour before initiation of tapping high and after tapping average. Thickness of virgin bark and renewed bark below average.

Yield is high. In onfarm evaluation trial, mean yield over first five years of tapping is 1631 kg/ha/yr. Average yield from large scale trial over 10 years is 47.23 g/tree/tap.

The clone has moderate tolerance to pink, powdery mildew and abnormal leaf fall. High incidence of tapping panel dryness. Wind damage below average.

3. RRII 414

The parents of this clone are RRII 105 and RRIC 100. Trunk is tall, straight and cylindrical with open, broad canopy of heavy dark green leaves, restricted to the top. Girth at opening is high and girth increment on tapping, average. This clone has recorded 40% improvement in yield over RRII 105 during 11 years of tapping in small scale trial and 26% improvement in yield over four years in large scale trial. Maintains better yield than RRII 105 in the on-farm trials. Moderately tolerant to Pink disease and abnormal leaf fall. Incidence of *Corynespora* leaf fall is low and powdery mildew is high.

4. RRII 430

Parentage comprises RRII 105 and RRIC 100. This clone has above average girth at opening. Canopy is open, broad and heavy with broad glossy leaves. Thickness of virgin bark is average and renewed bark is high. Recorded 20% improvement in yield over RRII 105 during 11 years of tapping in small scale trial and 36% improvement during four years of tapping in large scale trial. Maintains better yield than RRII 105 in the on-farm trial also. Tolerant to

pink disease, abnormal leaf fall and *Corynespora* leaf fall, but susceptible to powdery mildew.

5. RRIM 600

A high yielding clone evolved by the Rubber Research Institute of Malaysia and extensively grown in all the rubber growing countries. Parents are Tjir 1 and PB 86. Tall, straight trunk, moderate to fairly heavy branching and branch unions rather weak. Young plants show spindly growth and late branching with occasional leaning. Narrow, broom shaped crown, foliage sparse with small yellowish green leaves, normal wintering and refoliation.

Girth at opening low. Girth increment after opening high. Virgin bark thickness low. Thickness of renewed bark being high, usually results in bulging above tapping cut.

The clone shows rising yield trend. Initial yield above average and subsequent yield high. Does not exhibit yield depression prominently during summer. Average annual yield per ha. in estates over 20 years is 1349 kg. Latex unsuitable for concentration.

Highly susceptible to diseases caused by *Phytophthora*. Incidence of pink disease mild to severe. Requires effective control measures when planted in areas where these diseases are prevalent. Incidence of powdery mildew is mild.

6. GT 1

A primary clone developed in Indonesia and extensively planted in all rubber growing countries. Trunk upright but

slightly kinked. Variable branching habit. Main branches long and acute angled, secondary branches light. Narrow globular crown, dense dark green glossy foliage. Wintering and refoliation late and often partial. Girth at opening medium to high. Girth increment on tapping medium. Virgin and renewed bark thickness medium.

This clone shows rising yield trend. Summer yield fairly high. Average annual yield obtained in estates for 19 years is 1,420 kg. per ha. Latex is white.

Fairly wind fast. Occurrence of tapping panel dryness and incidence of pink disease mild. Abnormal leaf fall mild to medium and powdery mildew medium to severe.

7. RRII 5

A primary clone developed by the Rubber Research Institute of India. Selected from Malankara Estate, Thodupuzha. Vigorous clone, trunk straight and terete, canopy dense, low branching, several branches arising at acute angles. Bark thickness high. High yield with rising yield trend. Mean yield from large scale trial over 16 years is 76.42 g/tree/tap and that from estate trial (one location) over five years is 1352 kg/ha/yr. Susceptible to abnormal leaf fall and powdery mildew. Tapping panel dryness high. Pink disease and wind damage low. The quantum of timber yield from this clone is comparatively more.

8. RRII 203

A moderate yielding clone evolved by the Rubber Research Institute of India. Parents are PB 86 and Mil 3/2.

Trunk straight and tall, rather robust, canopy well distributed and balanced. Above average vigour at opening. Virgin and renewed bark thickness average. Average tolerance to diseases. Average initial and subsequent yield. Mean yield over ten years of tapping from commercial plantings at two locations is 1818 kg/ha/yr. Coagulum from latex and scrap show discoloration. This however, does not affect the quality of rubber. The quantum of timber is high.

9. PB 28/59

A Malaysian primary clone with fluted and crooked trunk, sometimes showing a tendency for leaning. Moderate to heavy branches, branching low. Girth at opening average and girth increment on tapping low. Virgin bark thickness low but thickness on renewal high. Average annual commercial yield over 19 years is 1,477 kg. per ha. Summer yield average.

Susceptibility to wind damage is average. Occurrence of tapping panel dryness is above average. The clone is highly prone to abnormal leaf fall, pink and powdery mildew diseases.

10. PB 217

The parents of this Malaysian clone are PB 5/51 and PB 6/9. Trunk tall and straight, branches light and foliage dense. Wintering and refoliation are normal to late. Girth at opening is average, girth increment on tapping high. Virgin bark thickness is low but renewed bark thickness is average.

Initial yield average with rising trend. Average yield over the first 15 years from estates is 1,508 kg./ha./year. Latex colour is light yellow.

Wind damage is very low. Tapping panel dryness low. Although incidence of *Phytophthora* is reported to be severe in Malaysia, the extent of abnormal leaf fall in India is low. Pink and powdery mildew diseases affect the clone severely.

11. RRII 417

The parentage of this clone is RRII 105 & RRIC 100. Trunk is tall and straight with leaf scars. Canopy is broad, open and heavy with semiglossy leaves. Girth at opening is above average. Thickness of virgin bark is average and of renewed bark is high. This clone has above average tolerance to wind. Susceptible to powdery mildew and moderately tolerant to pink disease, abnormal leaf fall and *Corynespora* leaf fall. The yield improvement over RRII 105 is 33% during the first eleven years in the small scale trial and 18% in the large scale trial.

12. RRII 422

Parents of this clone are RRII 105 & RRIC 100. Stem is crooked with high branching. Canopy is open narrow with dark green glossy leaves. Girth at opening is above average. This has recorded 23% yield increase over RRII 105 in the small scale trial over the first eleven years of tapping and 36% improvement over four years of tapping in the large scale trial. Tolerant to pink disease and abnormal leaf fall,

but susceptible to powdery mildew. Moderately tolerant to *Corynespora* leaf fall.

13. PB 235

This Malaysian clone has PB 5/51 and PB 5/78 as parents. Very vigorously growing clone with very tall and straight stem. Branches light with spreading dense foliage which undergoes normal wintering and refoliation. Girth increment on tapping average. Thickness of virgin bark average and that of renewed bark low.

Average annual yield obtained in estates over the first 15 years of tapping is 1501 kg/ha/yr. Summer yield average. Latex colour is pale yellow.

The clone experiences high wind damage. Incidence of panel dryness is high. Abnormal leaf fall and pink diseases are medium but powdery mildew affects trees severely. Stem bleeding and attack of bark feeding caterpillar are noted in certain localities.

14. RRIM 703

The parents of this clone are RRIM 600 and RRIM 500. It has an upright but slightly kinked trunk with a few heavy branches. The canopy is open and narrow. Wintering and refoliation occur early in the season. Girth at opening is high to average and girth increment on tapping low. Virgin bark thickness is high and renewed bark thickness average to high.

Estate scale yield levels in India are reported for the first ten years. This averages to 1310 kg./ha./year in one

location. Summer yield is low. Latex colour is light yellow.

Wind damage as well as tapping panel dryness high. Abnormal leaf fall is severe in India though reported to be only mild in Malaysia. Occurrence of powdery mildew is mild. The clone is susceptible to pink disease.

15. PR 255

The parents are Tjir 1 and PR 107. Vigour at opening above average and girth increment on tapping average. Trunk tall and straight. Canopy dense and balanced. High yielding, summer yield high. Incidence of abnormal leaf fall and pink disease moderate. Powdery mildew severe, panel dryness moderate. Wind damage low. Mean yield in large scale trial over ten years is 58.04 g/t/t.

16. PR 261

The female and male parents are Tjir I and PR 107 respectively. Vigour average, bark thickness average. Crown balanced with dense foilage. High yielding. Incidence of abnormal leaf fall and pink diseases moderate. Powdery mildew moderate to severe. Wind damage low. Occurrence of tapping panel dryness average. Mean yield in large scale trial over ten years is 51.34 g/t/t.

17. PB 280

A Malaysian primary clone developed from PBIG seedlings. A clone with average vigour, bark thickness high. High yielder as per Malaysian reports. Incidence of abnormal leaf fall and pink disease medium. Powdery

mildew severe. Wind damage high and panel dryness low. Mean yield in a large scale trial over first five years of tapping is 67.09 g/t/t.

18. PB 311

The female and male parents are RRIM 600 and PB 235 respectively. Vigorous in growth. Trunk sometimes leaning. Canopy heavy with dense foliage. Thickness of virgin bark low and that of renewed bark average. A high yielding clone as per Malaysian reports. Summer yield high. Incidence of powdery mildew and pink disease mild to medium. Wind damage very high and occurrence of panel dryness low. Mean yield over six years in large scale trial is 50.58 g/tree/tap. Average commercial yield over five years is 1450 kg/ha/yr.

19. PB 86

A Malaysian primary clone of slow growth, high crown and pale green leaves. Not easily prone to wind damage. Suitable for planting in exposed areas. Not tolerant to poor soils. Yield above average. Latex white. Prolific seeder. Highly susceptible to abnormal leaf fall and shoot rot. It performs well in Kanyakumari District where incidence of these diseases is very mild. Commercial yield in India over 25 years is 1,165 kg/ha/yr.

20. PR 107

This is a primary clone developed in Indonesia. Sturdy, wind resistant and of average vigour. Shows good girth increment on tapping. The clone though a slow starter,

shows rising trend. In India, average yield over 15 years under commercial planting is 1,043 kg./ha./yr. Yield gets slightly depressed during wintering. Withstands higher intensities of tapping. Susceptible to *Phytophthora*. Tolerant to powdery mildew.

21. RRIM 605

Parents of this clone are Tjir I and PB 49. Its initial yield performance in the northern districts of Kerala is not encouraging. Growth average. Good performance reported in Punalur and Pathanamthitta areas. The average commercial yield over 20 years in India is 1,135 kg./ha./yr.

22. RRIM 701

A moderate yielding clone with steady yield trend. Parents are 44/553 and RRIM 501. High vigour in the early years. Average girth increment on tapping. Susceptible to pink and powdery mildew diseases and wind damage. The average commercial yield over 15 years in India is 1,263 kg./ha./yr.

23. PB 5/51

A clone evolved in Malaysia by crossing PB 56 and PB 24. Stem straight and upright, branches light, horizontal and well distributed. Crown conical, light sparse foliage, small yellowish green leaves. Virgin bark thickness average, renewed bark thickness low. Vigour average before tapping and low after opening.

Initial as well as subsequent yield is average.

Commercial yield in India is 1,389 kg/ha/yr. during the first 20 years. Summer yield above average. Highly resistant to wind damage. Tolerance to abnormal leaf fall moderate, pink disease low. Highly susceptible to powdery mildew. Occurrence of panel dryness average.

24. RRII 118

A remarkably vigorous clone evolved by the Rubber Research Institute of India. Parents are Mil 3/2 and Hil 28. Trunk tall and stout. Prominent heavy branches, secondary branches long and slightly drooping in young stage. Several branches arise almost at the same level. Canopy dense, balanced crown. High vigour at opening. Virgin bark and renewed bark thickness average.

Average initial yield with rising yield trend. In commercial plantings, an average yield of 1164 kg/ha/yr. has been obtained during first ten years of tapping. Medium tolerance to diseases. Tapping panel dryness average.

25. RRII 208

A clone with above average yield in the initial years of tapping. Parents are Mil 3/2 and AVROS 255. High susceptibility to shoot rot and average tolerance to other diseases. The average yield from commercial planting over ten years of tapping is 1743 kg/ha/yr.

26. RRII 429

Parents are RRII 105 & RRIC 100. This clone with tall, straight and cylindrical trunk has a dense, heavy canopy

with dark green leaves. Girth at opening is high and girth increment on tapping average. Occurrence of TPD is above average. The yield improvement over RRII 105 in small scale trial is 47%. This clone is susceptible to pink disease and powdery mildew and is only moderately tolerant to abnormal leaf fall. The incidence of *Corynespora* leaf fall is low.

27. RRII 52

A primary clone evolved by selection from among the progeny of the genetic variant having compact canopy. This clone is of normal morphotype. The mean yield over nine years of tapping in the small scale trial registered 21% improvement over RRII 105. Yield trend during the initial years of tapping in the large scale trail is also encouraging. Vigour is average. Trunk is straight and cylindrical; balanced branching with acute angled secondary branches. The clone has a medium sized open canopy with glossy leaves. Colour of latex white.

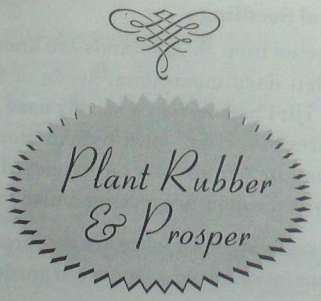
28. Polyclonal Seedlings

Seeds collected from clonal stands are known as clonal seeds. In olden days monoclonal seeds of the selected mother clone Tjir1 had been extensively used as improved planting materials. Now, only hybrid clonal seeds of polyclonal origin which can be expected to possess significant hybrid vigour are recommended for planting.

Polyclonal seeds of good quality are produced in specially planted and maintained polyclonal seed gardens. Three to

six selected parent clones mixed as per specific design are planted in such seed gardens. For prevention of pollen contamination from rubber trees of the neighbouring area, an isolation belt of 100 metres width is provided all around the seed garden.

Polyclonal seeds generally give rise to seedlings of good vigour. Compared to bud grafted plants they are easy to establish and maintain. The trunk of seedlings is much larger than those of budded trees. Owing to the inherent genetic variability, they are relatively less susceptible to wind damage and diseases. However, the general yield levels are far lower than selected modern clones. The high tree to tree variability in growth and yield makes it necessary to adopt thorough selection of seedlings for planting based on initial vigour, high initial planting density in the main field and subsequent judicious thinning out of weaklings and poor yielders in a phased manner. Still, the trees would exhibit wide spread occurrence of tapping panel dryness. The average annual yield is observed to remain low at 1,200 to 1,300 kg./ha./yr.



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