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PERFORMANCE OF A FEW RRII CLONES OF *HEVEA BRASILIENSIS* (WILLD. EX. A. JUSS) MUELL. ARG. IN A LARGE SCALE TRIAL

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ABSTRACT

Performance of nine clones of *Hevea brasiliensis* evolved by the Rubber Research Institute of India (RRII), Kottayam in a large scale trial over a period of 13 years is presented in this paper. The clones tested are RRII 101, RRII 103, RRII 105, RRII 106, RRII 107, RRII 114, RRII 116, RRII 151 and RRII 153. Wide variation was exhibited by the clones in yield and associated characters. The popular clone RRII 105 out-yielded all other clones. Only four clones showed better performance than the control (Tjir 1) as far as yield was concerned.

INTRODUCTION

Breeding of improved clones by hybridization is being practised in the RRII since 1954. From the early hybrids of 1954 and 1955, 39 lines were selected for large scale evaluation (Bhaskaran Nair, 1963; Bhaskaran Nair and Panikkar 1966; Bhaskaran Nair and George, 1968; Bhaskaran Nair and Jacob, 1968; Bhaskaran Nair, George and Saraswathy Amma, 1975). Out of these, nine clones, seven belonging to the 1954 progeny and two belonging to the 1955 progeny were evaluated in a large scale trial at the Central Experiment Station of the RRII. Performance of these clones during 13 years are presented in this paper.

MATERIALS AND METHODS

The details of the experimental material and their parentage are given in Table I. The experiment was laid out in an RBD with three replications and 49 plants per plot, planted adopting the square method as 4.87m spacing (Anonymous 1980). Plants were observed for eight years before commencement of tapping and five years thereafter. Important characteristics recorded were growth vigour during pre yielding period, girth increment after opening the trees, thickness of virgin bark and renewed bark, yield during the first five years of tapping, yield depression during summer, incidence of wind damage and susceptibility to common diseases under normal prophylactic conditions. Growth vigour was recorded by measuring the girth of the trunk at a height of 150 cm above the bud union. System of tapping adopted was 1/2 S d/2. Yield was estimated by cup coagulation method once in a month. Yield depression was assessed by computing the yield during the period February to May as the percentage of the annual yield (Bhaskaran Nair and Joseph 1975). Thickness of bark was measured using a Schleiper's guage (Bhaskaran Nair and Joseph 1981) at a height of 150 cm above bud union when the trees were 13 years old. Incidence of wind damage, pink disease and brown bast was estimated by counting the affected trees. Intensity of diseases of a general nature such as abnormal leaf fall and powdery mildew was assessed by visual observation of the extent of damage caused by them. Data on mean

Table 1. *Clones used in the trial*

Clones	HP series	Parentage
RRII 101	1954	Tjir 1 X AV 255
RRII 103	1954	Tjir 1 X Gl 1
RRII 105	1954	Tjir 1 X Gl 1
RRII 106	1954	Tjir 1 X Mil 3/2
RRII 107	1954	Tjir 1 X Mil 3/2
RRII 114	1954	Mil 3/2 X Hil 28
RRII 116	1954	Mil 3/2 X Hil 28
RRII 151	1955	Tjir 1 X PB 5/60
RRII 153	1955	Tjir 1 X PB 5/139
Tjir 1 (control)	Exotic	Primary clone

girth at opening, mean girth increment over five years of tapping, mean annual yield and yield depression during the first five years of tapping, mean thickness of virgin bark and renewed bark were subjected to statistical analysis.

RESULTS AND DISCUSSION

The observations are summarised and presented in Tables II and III.

Mean yield/tree/tap over five years was highest (62.17 g) in RRII 105. This clone was significantly superior to the control as well as other clones. Clone RRII 151 (30.51g) was the poorest yielder. Analysis of mean angles relating to yield depression during wintering period has shown that all RRII clones were significantly superior to the control. Among the RRII clones, depression was minimum (23.67%) in RRII 116 and maximum (51.67%) in RRII 151. Vigour during the pre-tapping period as indicated by girth of the trunk was found to be not significantly better in RRII clones compared to the control (47.89 cm). However clones like RRII 116 (52.65 cm), RRII 105 (51.08 cm) and RRII 114 (50.88 cm) were numerically superior while the girth of RRII 151 (44.20 cm), RRII 101 (44.22 cm) etc were found to be the minimum. Increase in the girth of the trees after commencement of tapping also showed very wide variation among the different clones. Annual girth increment was above 5 cm in RRII 101, 114 and 116 while in the case of RRII 105 (3.47 cm) and RRII 103 (3.95 cm) it was very low. RRII 101 and RRII 114 were found to be significantly superior to Tjir 1 in this character. Thickness of virgin bark did not show much variation among the clones observed. Similarly bark renewal was also found to be more or less comparable in the different clones.

Incidence of brown bast was comparatively high in RRII 153 (3.85%), RRII 105 (2.94%) and RRII 114 (2.38%) while it was completely absent in four clones RRII 107, RRII 116, RRII 151 and Tjir 1.

Pink infection was more in five clones compared to the control clone. Largest number of trees were affected (6.86%) in RRII 105 followed by RRII 151 (4.17%).

Table II. *Performance of clones in the trial*

Clones	Mean yield over 5 years (g/tree/tap)	Mean yield depression during wintering as percentage of mean yield	Mean girth at opening (cm/tree)	Mean annual girth increment after opening (cm/tree)	Mean thickness of virgin bark (mm/tree)	Mean thickness of 5 years renewed bark (mm/tree)
RRII 101	40.58	43.67 (41.35)*	44.22	5.93	11.21	8.04
RRII 103	42.53	32.33 (34.45)	45.08	3.95	11.45	8.66
RRII 105	62.17	33.33 (35.24)	51.08	3.47	11.78	8.71
RRII 106	32.50	26.00 (30.52)	47.17	4.68	10.93	8.16
RRII 107	33.97	42.67 (40.77)	48.02	4.18	10.49	7.50
RRII 114	33.60	31.67 (34.22)	50.88	5.47	11.02	7.95
RRII 116	42.95	23.67 (29.03)	52.65	5.18	10.54	7.24
RRII 151	30.51	51.67 (45.95)	44.20	4.74	11.18	7.80
RRII 153	37.37	47.33 (43.47)	44.51	4.28	10.68	8.09
Tjir 1	35.32	62.33 (52.14)	47.89	4.30	10.61	7.69
S.E.	2.71	1.88	1.97	0.39	0.38	0.35
C.D.	8.05	5.58	5.85	1.16	—	—

* Figures in parenthesis indicate the corresponding transformed figures (angles). S.E. and C.D. are for these figures only.

Table III. *Performance of clones in the trial*

Clones	Pink disease percentage incidence	Brown bast percentage incidence	Uprooting percentage incidence	Branch snap percentage incidence	Trunk snap percentage incidence	Total wind damage percentage incidence	Abnormal leaf fall	Powdery mildew
RRII 101	2.99	1.49	Nil	1.49	10.45	11.94	moderate	moderate
RRII 103	0.97	0.97	2.91	3.88	20.38	27.12	severe	light
RRII 105	6.86	2.94	Nil	5.88	12.75	18.63	light	light
RRII 106	0.79	0.79	0.79	Nil	0.79	11.58	severe	moderate
RRII 107	0.93	Nil	0.95	0.93	7.62	9.50	light	severe
RRII 114	2.38	2.38	1.19	Nil	3.57	4.76	light	light
RRII 116	1.75	Nil	Nil	Nil	1.75	1.75	light	moderate
RRII 151	4.17	Nil	Nil	6.25	38.54	44.75	light	light
RRII 153	1.92	3.85	1.92	Nil	10.58	12.50	light	severe
Tjir 1	1.85	Nil	Nil	2.78	11.11	13.89	moderate	severe

All clones were affected by damages caused by wind. RRII 151 was found highly prone to this malady affecting 44.75% of the trees. It was also high in RRII 103 (27.12%). In the case of RRII 151 only two types of wind damage namely trunk break and branch snap were noted while in the case of 103 uprooting also occurred. Except three, all RRII clones exhibited more resistance to this damage compared with the control. The clones exhibited very wide variability with regard to their susceptibility to powdery mildew and abnormal leaf fall diseases.

Among the clones evaluated RRII 105 remained outstanding in yield, initial girth, thickness of virgin bark and bark renewal. Some serious defects exhibited by this clone were high incidence of brown bast and pink disease. RRII 116 which was the second highest yielder also possessed certain good secondary characters like high initial vigour, good girth increment on tapping, low wintering depression and resistance to brown bast and wind damage.

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