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Early Performance of a few Sri Lanka Clones in India

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Introduction

Among the various methods adopted by the RRII for making available improved planting materials to the rubber planters of our country, introduction of clones from other countries is an important one. Clones reported to be better are regularly being imported to India from Malaysia, Indonesia, Thailand, Sri Lanka, China etc. Under this programme we had obtained 10 clones from Sri Lanka In 1972 in exchange for seven RRII clones. Among these ten clones one could not be established in our country due to complete budding failure. Remaining nine clones were established and multiplied further. For assessing the performance of these clones under the agroclimatic conditions prevalent in our country they are now being evaluated in clone trials in different parts of this country. The observations recorded from the first trial during the first ten years of planting are presented in this paper.

Method of Study

The clones evaluated are RRIC 7, RRIC 36, RRIC 45, RRIC 52, RRIC 100, RRIC 102, RRIC 104, RRIC 105 and Nab 17. A Popular clone, GT 1 is used as control. Some of these clones are developed from estate selections (Anonymous 1970, De Silva 1960) while others are produced by hybridisation (Fernando 1971 b). The details are given in table 1. The trial is being conducted at the Central Experiment Station of the RRII, which is situated in a typical rubber growing region of our country. Design adopted is randomised block with three replications. The number of plants per plot is 25 and the planting distance 5x5m (Anonymous 1980). Observations were carried out for ten years, seven years before tapping. and three years after opening for tapping. Growth vigour before and after tapping, thickness of virgin bark and renewed bark, latex vessel rings in the virgin bark, yield during the first three years of tapping, yield depression during summer, susceptibility to diseases and damages caused by wind were studied. Growth vigour has been assessed by measuring the girth of the trunk at a hight of 150 cm above the bud union. The trees were tapped on S/2 d/2 system and the yield potential was recorded by cup coagulation techniue. Yield depression during summer was assessed by computing the yield per tree per tap during the period. February to May as the percentage of the annual yield per tree per tap. Thickness of virgin bark was measured at the time of opening with a Schleipers gauge at a height of 150 cm. (Bhaskaran Nair and Joseph 1981). Thickness of renewed bark was measured after three years regeneration. The number of the latex vessel rings were counted by microscopical observations of thin sections of the bark samples, collected from a height of 150 cm, after appropriate staining. Diseases like pink, bark rot and brown bast as well as incidence of wind damage were recorded by counting the number of affected trees. Diseases such as secondary leaf fall and powdery mildew were assessed by visual observations.

Results and Discussion

The clones under evaluation showed very wide variation with regard to their various characteristics (table 2 A, 2B, 2C & 2D). While the clones like RRIC 104, RRIC 52 and RRIC 100 exhibited outstanding growth vigour during the immaturity period, growth of RRIC 36, RRIC 7 and RRIC 45 was very poor. Girth increment after commencement of tapping was high in RRIC 52 and RRIC 104, but low in RRIC 105. Reports from Sri Lanka indicate that the above three clones are vigorous in that country also (Fernando 1971 a, b: (Fernando and Wijesinghe 1970) RRIC 100 and RRIC 36 were found to be the highest yielders whereas the lowest yields were obtained from RRIC 52 and

RRIC 105. Similar performance is reported from Sri-Lanka also (Chandrasekaran 1972, Fernando 1971 a). Yield drop during summer was very pronounced in RRIC 105. Clones like RRIC 52 did not show this trend. RRIC 102 surpassed all other clones with respect to the thickness of virgin bark, whereas RRIC 45 was found lagging behind all other clones in this aspect. The number of latex vessel rings present in the virgin bark also varied widely from clone to clone. High yielding clones like RRIC 36 and RRIC 100 recorded high numbers of latex vessel rows while their number was lowest in RRIC 52, the lowest yielder. The rate of bark renewal, as indicated by the thickness of renewed bark was found to be more in RRIC 104 while it was very low in the case of RRIC 45, Clone to clone variation was very evident regarding their tolerance to the various, maladies affecting them. Abnormal leaf fall due to *Phytophthora* spp. was high in a few clones like Nab 17, average in certain others such as RRIC 45 and RRIC 52 and comparatively low in the case of RRIC 100, RRIC 105 etc. Susceptibility of Nab 17 to this disease has been observed in other countries also (Anonymous 1971). All clones were found affected by pink disease to varying degrees, RRIC 36, RRIC 45 etc. being highly prone and clones like RRIC 102 being comparatively less affected. All the clones were found affected by powdery mildew also though their degree of susceptibility varied. While the clones like RRIC 105 and Nab 17 were highly susceptible it was low in RRIC 52, RRIC 102 etc. A few other clones like RRIC 7 showed average resistance to this disease. RRIC 52 and RRIC 102 are reported to be resistant to this disease in Sri Lanka also (Chandrasekara 1972, Fernando 1971 a). Bark rot was noticed only in RRIC 7, RRIC 36 and RRIC 104 and the infection was less than two persent of the trees. Reports from Sri Lanka also confirm the susceptibility of RRIC 36 to this disease (Chandrasekara 1972). Trees of five clones were found developing symptoms of brown bast during this short period of exploitation. However their number was less than two percent in all, without much variation among the different clones. All clones were found affected by wind to varying extent. The damage was highest in RRIC 45 and lowest in RRIC 7. Eventhough all three major types of damage occurred uprooting and trunk breaking were most common.

The Sri Lanka clones imported to India were found to possess some good secondary characters like vigorous growth and tolerance to certain diseases. Their yield during the first three years of exploitation was found promising compared to GT 1.

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Table–1. Parentage of clones in the trial

Clone	Parentage
RRIC 7	Primary
RRIC 36	PB 86 x PR 107
RRIC 45	RRIC 8 x Tjir 1
RRIC 52	Primary
RRIC 100	RRIC 52 x PB 86
RRIC 102	RRIC 52 x RRIC 7
RRIC 104	RRIC 52 x Tjir 1
RRIC 105	RRIC 52 x Tjir 1
Nab 17	Primary
GT 1	Primary

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Table 2 A. Performance of clones in the trial

Clone	Mean yield over three years (g/tree/tap)	Yield depression during summer as percentage of mean yield	Mean girth at opening (cm)	Mean annual girth increment after opening (cm)
RRIC 7	28.79	33	47·04	4.42
RRIC 36	34.99	14	45.21	3.96
RRIC 45	29.32	39	48.98	4.06
RRIC 52	21.34	32	58.31	5.63
RRIC 100	37.41	31	57.48	3.85
RRIC 102	33.94	44	54.56	3.66
RRIC 104	32.05	28	64.49	4.52
RRIC 105	26.00	49	56.49	3.03
Nab 17	34.00	36	51.01	3.32
GT 1	28.12	42	52.48	3.74

Table–2. B. Performance of clones in the trial

Clone	Mean thickness of virgin bark (mm)	Latex vessel rings in virgin bark	Mean thickness of three year renewed bark (mm)	Abnormal leaf fall
RRIC 7	6.75	10.00	7.65	Severe
RRIC 36	7.28	100.78	7.71	Severe
RRIC 45	6.60	7.28	5.02	Moderate
RRIC 52	9.03	6.04	7.72	Moderate
RRIC 100	9.01	7.98	7.43	Light
RRIC 102	8.14	10.00	7.14	Light
RRIC 104	9.26	9.52	8.29	Light
RRIC 105	8.15	7.15	7.34	Light
Nab 17	7.46	8.50	8.13	Severe
GT 1	7.81	8.30	6.88	Moderate

Table-2 C. Performance of clodes in the trial

Clone		Pink disease percentage incidence	Brown bast percentage incidence	Bark rot percentage incidence	Powdery mildew
RRIC	7	4.69	Nil	1.56	Moderate
RRIC	36	17-74	Nil	1.61	Light
RRIC	45	15.79	1.75	Nil	Light
RRIC	52	9.84	Nil	Nil	Light
RRIC	100	14.75	1.65	Nil	Light
RRIC	102	1.75	Nil	Nil	Light
RRIC	104	12.90	1.61	1.61	Moderate
RRIC	105	8.82	1.47	Nil	Severe
Nab	17	8.20	1.64	Nil	Severe
GT	1	6.90	Nil	Nil	Severe

Table 2 D. Performance of clones in the trial

Clone		Uprooting percentage incidence	Trunk snap percentage incidence	Branch snap percentage incidence	Total wind damage percentage incidence
RRIC	7	3.13	1.56	Nil	4.69
RRIC	36	3.23	3.23	Nil	6.46
RRIC	45	10.53	10.53	Nil	21.06
RRIC	52	8·20	Nil	Nil	8.20
RRIC	100	9.84	3.28	1.64	14.76
RRIC	102	1.75	8.77	Nil	10.52
RRIC	104	6.45	4.84	3.23	14.52
RRIC	105	2.94	41.4	Nil	7.35
Nab	17	8.20	3.28	1.64	13.12
GT	1	Nil	5.17	5.17	10.34