Rubb Board bull. 20, No. 2

876

EVALUATION OF PLANTING MATERIALS UNDER COMMERCIAL PLANTINGS—SECOND REPORT

PN KRISHNANKUTTY, KG SREENIVASAN

Introduction

The choice of cultivars is an important management decision in agriculture. The selection of planting materials assumes more importance where the crops are perennial having long gestation period and substantial financial investment, like rubber. For taking a correct decision in this regard, the planter should have reliable data on yield and other characteristics of various modern materials. The availability of reliable data would also enable the research and development wings to make correct planting material recommendations in the crops concerned. With this object in view, a study has been taken up in rubber. The first report of this study was published in 1982 (Rubber Board Bulletin, vol, 17). The present one is the second in the series.

Background, Coverage and Analysis of data

There were earlier attempts for finding out the commercial yields of certain selected popular materials. However, the scope and coverage of such studies were very limited. Moreover, such studies were not aimed at making continuous evalution of the yield performance of various clones and clonal seedlings. The progress of the study initiated by the Rubber Research Institute of India in 1966 with the purpose of continuous evaluations of various cultivars was not encouraging, as sufficient co-operation from the participating estates was not forthcoming. The present study was initiated in 1974. In this study, a large number of estates was included for getting more meaningful and representative data. Moreover, available data for previous years in respect of fields planted with popular materials were collected as far as possible, from all the major estates included in the study.

At the end of 1983-84, sixty three large estates scattered in Kerala and Tamil Nadu participated in the study. The monthly yield returns obtained from these estates are being scrutinised thoroughly and clarifications sought whenever necessary,through correspondence and visits. Monthwise data of yield, tapping system, number of trees tapped etc. are tabulated for each field for one complete year beginning with the month of opening for tapping. It was found that the stand per hectare in the initial years of tapping varied considerably from estate to estate, and planting material to planting material. Therefore, certain norms have been fixed thereby only those fields with a minimum of 250 trees per hectare under tapping in the first year, 275 trees in the second year, and 300 trees in the subsequent years of tapping are included in the compilation of data for evaluating their performance.

The yield figures reported are provisional and may change when additional fields are included in the study from time to time. With regard to a few planting matetials the number of fields is limited. Therefore, the data of their yields presented in this report are not claimed fully representative. However, the information collected would definitely give a broad indication of their yield potential.

Another point to be noted is that the report does not claim to give yield data of all the modern planting materials. It may be noted that commercial yields of RRII 105, RRII 118 and RRII 208, which are considered to be clones of promise, are not included in this report. This is because sufficient fields, under tapping, planted with these materials are not available in the estates covered by the study. In spite of this limitation, the findings of this study are considered very useful as the availability of these pieces of information would enable for undertaking a comparative evaluation of the performance of clones found to be outstanding yielders in small scale and trial plantings. This will also enable the Rubber Board to make a fair estimate of the total production of rubber.

Yield performance

The mean yields of twenty two planting materials are presented in Table I. The yield figures are given in kilograms per hectare per annum. Among the various materials, the first five year mean yield of PB 28/59 is found to be the highest, with 1188 kg The five year mean yield for PB 252 is found to be 1199 kg. This, however, is not considered conclusive as there are only two mature fields under this material. PB 28/59 is very closely followed by RRIM 600, RRIM 605 and PB 6/9 with 1145, 1130 and 1121 kg/ha/annum, respectively Other planting materials which are found to give a mean annual yield of more than 1000 kg are GT 1, PB 217, PB 235

TABLE I

YIELD PERFORMANCE OF CLONES AND CLONAL SEEDLINGS IN COMMERCIAL PRACTICE IN INDIA

(KILOGRAMMES PER HECTARE PER ANNUM)

CLONES AND CLONAL SEEDLINGS	Year of tapping 1	2	3	4	5	Mean yield over the first five years of tapping	Year of tapping 6	7	8	9	10	Mean yield over the first ten years of tapping
1. RRIM 600	755(42)	1036(46)	1188(39)	1332(34)	1416(26)	1145	1426(18)	1547(12)	1477(10)	1601(1)		
2. GTI	731(35)	975(37)	1114(33)	1311(26)	1279(23)	1802	1477(14)	1625(8)	1548(3)	1486(1)	1716(1)	1326
3. PB 28/59	739(21)	1117(20)	1347(17)	1427(15)	1310(10)	1188	1229(7)	1308(5)	1947(3)	1722(1)		
4. RRIM 605	813(21)	1011(21)	1255(22)	1276(20)	1294(20)	1130	1376(18)	1395(18)	1238(15)	1215(12)	1156(10)	1203
5. RRIM 628	662(7)	849(8)	1040(8)	1016(7)	948(7)	903	1037(4)	1216(3)	1178(1)			
6. RRIM 623	782(23)	952(27)	1003(28)	1029(28)	1099(27)	973	1237(26)	1239(26)	1200(22)	1140(18)	1155(14)	1084
7. RRIM 701	537(3)	787(3)	962(3)	1105(3)	1126(3)	903						
8. PB 86	497(29)	783(33)	1008(35)	1171(37)	1183(41)	928	1251(39)	1293(39)	1318(38)	1430(26)	1354(41)	1129
9. PB 5/139	543(14)	1025(14)	1277(14)	1346(14)	1357(15)	1110	1359(17)	1586(17)	1613(17)	1542(16)	1517(16)	1317
10. PB 6/9	716(6)	976(6)	1306(6)	1327(6)	1281(7)	1121	1348(7)	1511(5)	1346(4)	1245(5)	1185(4)	1224
11. PB 5/51	693(11)	919(11)	1050(12)	1140(11)	1176(9)	996	1404(8)	1733(7)	1504(4)	1675(3)	1585(3)	1288
12. PB 235*	965(3)	1039(3)	1254(2)	1143(2)	1153(1)	1111						
13. PB 217*	709(7)	925(7)	1056(6)	1110(4)	1205(3)	1001	1015(1)					
14. PB 252*	659(2)	1087(2)	1139(2)	1371(2)	1739(1)	1199						
15. GI 1	524(13)	811(15)	1021(15)	1169(16)	1179(18)	941	1309(18)	1276(24)	1379(25)	1313(25)	1313(25)	1129
16. PR 107	548(7)	731(7)	897(7)	856(7)	1111(7)	829	1136(9)	1284(8)	1270(7)	1287(7)	1316(6)	1044
17. LCB 1320	415(8)	677(10)	830(10)	896(11)	948(14)	753	990(15)	1058(15)	1126(15)	1105(15)	1156(13)	920
18. PBIG/GG1	599(65)	856(72)	1001(74)	1234(75)	1308(74)	1000	1283(73)	1213(73)	1271(73)	1385(72)	1279(63)	1138
19. PBIG/GG2	578(45)	810(51)	908(53)	1152(53)	1203(52)	930	1225(52)	1201(52)	1182(49)	1295(47)	1297(42)	1085
20. PBIG/GG4	562(4)	814(7)	916(6)	1130(5)	1028(4)	890	1145(2)					
21. Tjir 1 (C.S)	492(20)	683(21)	795(24)	834(24)	845(26)	730	902(28)	888(32)	916(29)	989(30)	942(26)	829
22. Tjir 1 (B. G)	519(3)	656(3)	746(6)	846(7)	942(10)	742	1091(12)	1124(13)	1082(13)	1138(13)	1151(13)	930

Figures in brackets indicate the number of fields.

[Note * Under experimental planting]

TABLE II

YIELD PERFORMANCE OF CERTAIN SELECTED PLANTING MATERIALS IN SOME OF THE IMPORTANT RUBBER GROWING REGIONS

Clones/ Clonal seedlings in different regions	Year of planting 1	2	3	4	5	Mean Yield over the 1st five years of tapping (Not weighted)	Year of Planting 6	7	8	9	10	Mean Yield over the 1st 10 years of tapping (Not weighted)
PBIG/GG 1												
Region B	578(30)	823(35)	970(37)	1289(36)	1345(37)	1001	1314(37)	1240(36)	1313(35)	1372(34)	1436(28)	1168
Region C	638(19)	935(19)	1056(18)	1308(19)	1344(20)	1056	1377(18)	1371(18)	1386(20)	1415(21)	1466(19)	1229
Region D	590(16)	849(17)	975(17)	1109(17)	1226(17)	950	1167(18)	1139(19)	1078(18)	1120(17)	1216(16)	1047
PBIG/GG 2												
Region B	603(17)	865(20)	911(22)	1281(22)	1263(22)	985	1275(22)	1273(22)	1239(21)	1459(21)	1416(18)	1159
Region C	563(11)	841(11)	987(11)	1229(11)	1255(11)	975	1349(11)	1242(11)	1209(11)	1195(11)	1304(11)	1117
Region D	575(15)	758(17)	882(17)	1003(17)	1104(17)	864	1017(17)	1102(17)	1085(15)	1070(14)	1153(12)	975
PB 28/59												
Region A	793(2)	1658(1)	1497(1)	1907(1)	—	—	—	—	—	—	—	—
Region B	786(8)	1136(8)	1475(7)	1459(7)	1433(4)	1258	1401(3)	1621(2)	1909(1)	—	—	—
Region C	697(10)	1037(10)	1245(8)	1327(6)	1177(5)	1097	1101(4)	1100(3)	1831(2)	1722(1)	—	—
Region D	819(1)	1216(1)	1125(1)	1324(1)	1484(1)	1194	—	—	—	—	—	—
GT 1												
Region B	759(5)	1072(6)	1248(4)	1359(4)	1578(2)	1203	1125(1)	—	—	—	—	—
Region C	777(15)	1015(15)	1245(12)	1433(11)	1368(9)	1168	1906(5)	1851(3)	1410(1)	—	—	—
Region D	671(15)	898(16)	990(17)	1172(11)	1162(12)	979	1253(8)	1490(5)	1618(2)	1486(1)	1716(1)	—
RRIM 600												
Region A	789(5)	1146(6)	1371(6)	1480(4)	1590(2)	1275	1583(1)	1519(1)	1222(1)	—	—	—
Region B	749(19)	1050(20)	1178(16)	1357(13)	1518(9)	1170	1492(7)	1587(3)	1605(8)	1601(1)	—	—
Region C	747(11)	1004(11)	1158(10)	1325(9)	1421(8)	1131	1427(7)	1588(5)	1431(3)	—	—	—
Region D	757(7)	968(9)	1097(7)	1225(8)	1235(7)	1056	1189(3)	1388(3)	1480(3)	—	—	—
PB 5/51												
Region B	622(4)	975(4)	1184(4)	1342 3)	1221(2)	1069	1024(2)	1622(1)	1251(1)	—	—	—
Region C	719(5)	904(5)	954(5)	1081(5)	1150(5)	962	1691(4)	1666(4)	1590(3)	1676(3)	1583(3)	—
Region D	773(2)	848(2)	1033(3)	1036(3)	1195(2)	977	1211(2)	1924(2)	—	—	—	—
PB/86												
Region A	479(8)	838(9)	1142(10)	1399(10)	1582(9)	1088	1591(7)	1748(8)	1628(7)	1949(5)	1859(5)	1422
Region B	414(8)	617(9)	826(9)	985(10)	1188(11)	806	1119(11)	1230(11)	1179(10)	1267(10)	1397(10)	1022
Region C	607(9)	1008(9)	1162(10)	1228(12)	1235,14)	1048	1307(13)	1315(13)	1373(13)	1428(13)	1411(16)	1207
Region D	537(4)	723(4)	970(4)	1122(4)	1201(4)	911	1350(4)	1474(4)	1331(4)	1395(4)	1237(4)	1134
RRIM 605												
Region A	666(1)	1111(2)	1263(2)	1609(2)	1574(2)	1245	1919(2)	1514(2)	1551(2)	1808(2)	1298(1)	1431
Region B	1061(5)	1380(4)	1527(5)	1743(4)	1531(5)	1448	1670(5)	1658(5)	1414(5)	1399(4)	1573(4)	1496
Region C	928(5)	1211(6)	1471(6)	1408(6)	1418(6)	1287	1428(5)	1654(5)	1550(2)	1303(1)	1322(1)	1369
Region D	685(8)	867(8)	941(8)	784(7)	880(6)	831	887(6)	909(5)	839(5)	808(4)	—	—
PB 5139												
Region A	473(6)	986(6)	1311(6)	1372(5)	1276(6)	1084	1380(8)	1574(8)	1556(8)	1397(7)	1420(6)	1275
Region B	441(1)	820(1)	939,1)	1115(1)	1393(1)	942	1021(2)	1399(2)	1347(2)	1426(2)	1469(2)	1137
Region C	570(6)	1061(6)	1282(6)	1345(7)	1397(7)	1131	1432(7)	1654(7)	1754(7)	1721(7)	1539(6)	1376
GL 1												
Region A												
Region B	481(4)	947(4)	1060(4)	1197(4)	1363(5)	1010	1426(4)	1283(7)	1517(7)	1299(7)	1540(7)	1211
Region C	435(3)	672(4)	949(4)	992(4)	1051(4)	820	1115(4)	1154(4)	1336(4)	1405(4)	1256(4)	1037
Region D	598(6)	813	1042(7)	1222(7)	1203(8)	976	14)	1395(11)	1414(12)	1351(12)	1174(12)	1162

TABLE III

YIELD PERFORMANCE OF CLONES AND CLONAL SEEDLINGS IN COMMERCIAL PRACTICE

(IN KILOGRAMMES PER HECTARE PER ANNUM)
IN INDIA AND MALAYSIA

	CLONES CLONAL SEEDLINGS	COUNTRY	Year of tapping 1	2	3	4	5	Mean yield over the first five years of tapping	6	7	Year of tapping 8	9	10
1	RRIM 600	India	755(42)	1036(46)	1188(39)	1332(34)	1416(26)	1145	1426(18)	1547(12)	1477(10)	1601(1)	
		Malaysia	854(186)	1127(193)	1458(150)	1678(94)	1815(63)	1386	2020(36)	2132(29)	2100(14)	2009(12)	
2	GTI	India	731(35)	975(37)	1114(33)	1311(26)	1279(23)	1082	1477(14)	1625(8)	1548(3)	1486(1)	1716(1)
		Malaysia	670(183)	1012(260)	1296(282)	1476(270)	1575(226)	1206	1716(184)	1726(140)	1816(85)	1994(45)	2050(24)
3	PB 28/59	India	739(21)	1117(20)	1347(17)	1427(15)	1310(10)	1188	1229(7)	1308(5)	1947(3)	1722(1)	
		Malaysia	904(39)	1456(63)	1823(64)	1765(65)	1711(52)	1532	1713(38)	1882(38)	2115(10)	2007(4)	
4	RRIM 605	India	813(21)	1011(21)	1255(22)	1276(20)	1294(20)	1130	1376(18)	1395(18)	1238(15)	1215(12)	1156(10)
		Malaysia	914(194)	1149(247)	1378(238)	1476(254)	1518(199)	1287	1612(165)	1610(119)	1611(71)	1652(38)	1671(27)
5	RRIM 628	India	662(7)	849(8)	1040(8)	1016(7)	948(7)	903	1037(4)	1216(3)	1178(1)		
		Malaysia	1061(61)	1205(80)	1490(78)	1541(64)	1597(47)	1379	1705(14)	1679(14)	NA		
6	RRIM 623	India	782(23)	952(27)	1003(28)	1029(28)	1099(27)	973	1237(26)	1239(26)	1200(22)	1140(18)	1155(14)
		Malaysia	836(237)	1108(320)	1273(324)	1405(326)	1478(294)	1220	1640(233)	1781(183)	1785(107)	1849(63)	1817(36)
7	RRIM 701	India	537(3)	787(3)	962(3)	1105(3)	1126(3)	903					
		Malaysia	683(47)	989(57)	1429(52)	1699(31)	1690(14)	1298					
8	PB 86	India	497(29)	783(33)	1008(35)	1171(37)	1183(41)	928	1251(39)	1293(39)	1318(38)	1430(36)	1354(41)
		Malaysia	495(194)	677(150)	872(101)	1075(99)	1309(90)	886	1423(93)	1556(101)	1578(137)	1629(124)	1634(89)
9	PB 5/51	India	693(11)	919(11)	1050(12)	1140(11)	1176(9)	996	1404(8)	1733(7)	1504(4)	1675(3)	1585(3)
		Malaysia	765(217)	1005(277)	1311(292)	1455(272)	1600(224)	1227	1681(181)	1864(127)	1853(87)	1802(51)	1737(30)
10	PBIG/GG1	India	599(65)	856(72)	1001(74)	1234(75)	1308(74)	1000	1283(73)	1213(73)	1271(73)	1335(72)	1279(63)
		Malaysia	657(152)	1002(140)	1263(132)	1420(174)	1354(149)	1139	1498(118)	1490(83)	1516(62)	1602(34)	1611(21)
11	PBIG/GG2	India	578(45)	810(51)	908(53)	1152(53)	1203(52)	930	1225(52)	1201(52)	1182(49)	1295(47)	1297(42)
		Malaysia	732(22)	1025(23)	1291(20)	1426(20)	1424(80)	1180	1408(5)	NA	NA	NA	NA
12	GI 1	India	524(13)	811(15)	1021(15)	1169(16)	1179(18)	941	1309(18)	1276(24)	1379(25)	1313(25)	1313(25)
		Malaysia	597(115)	862(107)	1002(86)	1205(67)	1126(43)	958	1144(15)	1172(10)	1338(6)	1480(3)	1336(2)
13	PR 107	India	548(7)	731(7)	897(7)	856(7)	1111(7)	829	1136(9)	1284(8)	1270(7)	1287(7)	1316(6)
		Malaysia	490(114)	747(153)	1009(159)	1234(158)	1369(156)	970	1495(159)	1581(171)	1707(172)	1817(157)	1840(133)
14	LCB 1320	India	415(8)	677(10)	830(10)	896(11)	948(14)	753	990(15)	1058(15)	1126(15)	1105(15)	1156(13)
		Malaysia	541(50)	836(62)	1112(63)	1238(72)	1357(82)	1017	1417(81)	1486(79)	1510(73)	1597(47)	1515(40)
15	Tjir 1(C.S)	India	492(20)	683(21)	795(24)	834(24)	845(26)	730	920(28)	888(32)	916(29)	989(30)	942(26)
		Malaysia	433(74)	612(46)	810(45)	971(35)	1236(42)	812	1298(29)	1161(34)	1172(41)	1201(49)	1224(49)
16	Tjir 1(B.G)	India	519(3)	656(3)	746(6)	846(7)	942(10)	742	1091(12)	1124(13)	1082(13)	1138(13)	1151(13)
		Malaysia	532(54)	670(48)	862(35)	1102(29)	1204(30)	874	1367(31)	1316(42)	1278(37)	1234(42)	1328(37)

Figures in brackets indicate the number of fields.

SOURCE FOR MALAYSIAN YIELD FIGURES: PLANTER'S BULLETIN. *NO. 144, MAY 1976,

and PB 5/139.

Yield data of PB 28/59, RRIM 600 and certain other modern clones are not available for the first ten years of tapping. However, the data available after the first five years of tapping also show that the trends in yield of these clones are quite promising. The mean yield obtained for RRIM 600 for the first nine years of tapping is 1308 kg. The corresponding figure for PB 28/59 is 1350 kg. Among the planting materials for which 10 year data are available, GT 1 is found to be the highest yielder, with an average annual yield of 1326 kg/ha. Other materials which are found to have yielded more than 1200 kg during the first ten years of tapping are RRIM 605, PB 5/139, PB 5/51 and PB 6/9. The incidence of brown blast, other diseases and other secondary characteristics have not been assessed in the study.

Yield performance in various regions

The yield performance of the same planting material shows variations in different regions. In order to analyse these variations in terms of production, the region-wise performance has been worked out for some of the materials for which data are available. For the region-wise classification also only the major rubber growing areas have been considered, as grouped below:-

Region A: Estates located in Kanyakumary district of Tamilnadu

Region B: Estates located in Quilon and Pathanamthitta districts.

Region C: Estates located in Kottayam and Idukki districts.

Region D: Estates located in Trichur, Malappuram and Kozhikode districts.

The performances of important planting materials in the different regions covered by the study, are presented in Table II. As mean yield figures are available only for the first five years of tapping of these materials, the information given relates only to the performance in terms of yield only for the initial five year period.

The highest yield for PBIG/GG1, during the first five years, is obtained in Region C with 1056 kg. This is higher than the yield obtained in Region D by 11%. In respect of first ten year yield as well, its performance is best in Region C. The yield obtained for PBIG/GG2 is below 1000 kg in all the three regions. As compared to Region D, the yield obtained for this material in Region B is 14% more. For PB 28/59, the highest yield is obtained again in Region B with a mean annual yield of 1258 kg which is more than the yield obtained in Region C by 15%. Yield data of this clone for the first four years of tapping indicate promising trends in region A also. In respect of GT 1 also the highest yield of 1203 kg is obtained in Region B. This is more than the yield obtained in Region D by 23%. The yield obtained for RRIM 600 is 1275 kg in Region A followed by 1170 kg in Region B. In Region A, the yield is more by 21% compared to Region D. PB 5/51 is found to perform well in Region B with 1069 kg whereas it is less than 1000 kg in Regions C and D. The performance of PB 86 is not found good in Region B, though it is comparatively good in Region A wherein its yield is 35% more than what is obtained in Region B. The highest yield for RRIM 605 is obtained in Region B with 1448 kg. The highest yields for PB 5/139 and G1 1 are obtained in Region A and B respectively.

The Rubber Research Institute of Malaysia has also conducted a similar study and the results have been published (Planter's Bulletin No 144, 1976). The mean yield obtained for the various planting materials in India and Malaysia are presented in Table III for a comparative study. The Malaysian five year mean yield is more than that of India in respect of all the materials excepting in the case of PB 86.

Acknowledgements

The authors are grateful to Sri. P. Mukundan Menon, Rubber Production Commissioner for providing them necessary facilities and encouragements for conducting the study. They are also grateful to Dr. V. Haridasan, Economist and Dr. A. O. N. Panicker, Deputy Director, Botany for their guidance and help in conducting the study as well as in the preparation of the report. They also wish to thank Shri. V. C. Markose, Plant Breeder for his valuable suggestions for improvement of the report. □

A Paper on Poverty Among Rubber Small holders in Malaysia

A paper recently published by Abu Asmara bin Haji Mohamed highlights issues related to poverty among rubber small holders in Peninsular Malaysia by reviewing existing empirical evidences. The paper discusses :

Distribution and extent of poverty

Identification of poverty groups

Causes of poverty

Effects of poverty

Programmes to reduce poverty.