

Clone adoption in traditional rubber growing regions

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Introduction

The clone RR II 105 was released for commercial cultivation in 1980 (Varghese *et al.*, 1990) and by 1984 this clone accounted for 89 per cent of the areas planted under the Subsidy Scheme of the Rubber Board in smallholdings (Ipe and Haridasan, 1988). Higher yield of RR II 105 by 370 kg/ha than the then most popular clone RRIM 600 was reported to be the major reason for the preference for RR II 105. This clone had remained as an undisputed mono-clone for twenty five years as is evident that even in 2004 it occupied 95 per cent of the total area availed planting subsidy under the RPD (Rubber Plantation

Development) scheme of the Rubber Board (Veeraputhran *et al.*, 2013). At this juncture, the Rubber Board released two high yielding RR II 400 series clones viz., RR II 414 and 430 in 2005 and two

other high yielding clones of this series viz., RR II 417 and 422 in 2009 for commercial cultivation as their yield is on an average 20 to 30 per cent higher than the popular clone RR II 105 (Girish and Mydin, 2013). Subsequently, Veeraputhran *et al.*, 2013 (a)&(b) examined the trends in the adoption of clones under



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Table 1. Adoption of RR11 105
(Percentage shares in total area planted under each regional office)

No	R O	2005	2010	Difference
1	Thodupuzha	86.64	19.79	-66.85
2	Changanassery	94.12	29.02	-65.10
3	Kottarakkara	97.43	38.91	-58.52
4	Punalur	97.99	42.30	-55.69
5	Adoor	97.96	42.29	-55.67
6	Erattupetta	97.51	43.51	-54.00
7	Pala	89.15	37.94	-51.21
8	Kothamangalam	90.87	40.47	-50.40
9	Pathanamthitta	78.31	33.10	-45.21
10	Kottayam	92.06	49.21	-42.85
11	Muvattupuzha	97.26	56.15	-41.11
12	Kanjirappally	70.76	30.52	-40.24
13	Thalassery	99.18	59.60	-39.58
14	Sreekandapuram	97.22	59.93	-37.29
15	Kanhagad	99.24	65.77	-33.47
16	Manjeri	98.09	68.31	-29.78
17	Taliparamba	98.97	69.23	-29.74
18	Palakkad	98.72	72.18	-26.54
19	Thrissur	99.43	74.17	-25.26
20	Ernakulam	90.43	66.54	-23.89
21	Nilambur	97.06	77.78	-19.28
22	Nedumangad	99.30	80.68	-18.62
23	Kozhikode	75.26	56.66	-18.60
24	Mannarkad	98.82	85.40	-13.42
25	Thiruvananthapuram	98.37	85.05	-13.32
26	Marthandom	32.49	53.21	20.72
Total area (ha)	9347.99	5193.19	-4154.80	
Area under RR11 105 (ha)	8681.26	2893.39	-5787.87	
Percentage share in total area	92.87	55.72	-37.15	

different size-classes across regions in the traditional region during the seven year period from 2004 to 2010. This study brought out the general trends in clone adoption across five agro-climatic zones in the traditional rubber growing belt in India. Accordingly, it was observed that new clones witnessed wider adoption which is evident from the expansion of area under these clones from three per cent in 2005 to 28 per cent in 2010. However, the study revealed that, across regions and size-classes (a) no clone showed consistency in its adoption (b) level of adoption of new clone clones was lower in 2010 compared to 2009, and (c) since 2010 a reversal in clone preference in favour of RR II 105. However, since this study has not analysed the trends in clone adoption at disaggregate level (under the jurisdiction of each regional office of the Rubber Board), the present paper is an attempt towards this end. This analysis assumes importance as it will help each regional office to understand the trends in clone adoption and to identify the factors influencing thereon in its jurisdiction. The paper is based on the database consisting of 14832.87 ha under 33187 permits, which availed planting subsidy under the Rubber Plantation Development (RPD) scheme during 2005 and 2010 through 26 regional offices of the Rubber Board in the traditional rubber growing

region. The paper is broadly divided in to four parts. The first three parts deals with the adoption of (a) RR II 105, (b) RR II 400 series clones, and (c) multi-clones, and the final part is conclusion. However, the trends in the adoption of RR II 429, RRIM 600, PB clones, and others are excluded in the paper as they constitute only two per cent of the total area.

Adoption of RR II 105

In 2005 the total area availed planting subsidy was 9347.99 ha but it declined to the level of 5193.19 ha in 2010, i.e., a decline of 44 per cent during this period (Table 1). From Table 1 it can be seen that until the release of new clones RR II 105 had been the most popular one, which is evident that it occupied 93 per cent of the total area in 2005. Moreover, of the 26 regional offices, 21 had more than 90 per cent of the total area planted with this clone during this year. However, subsequent to the introduction of new clones the area under RR II 105 declined drastically and reached the level of 56 per cent in 2010. The highest decline in area was observed in Thodupuzha, Changanassery, and Kanjirappally regions, where this clone occupied only 19.79, 29.02, and 30.52 per cent respectively of their total area. However, this clone is still the most popular one in the regions of Mannarkkad, Thiruvananthapuram,



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Table 2. Adoption of RRII 400 series clones
(Percentage shares in total area planted under each regional Office)

No	R O	2005	2010	Difference
1	Changanassery	1.15	22.91	21.76
2	Erattupetta	2.40	43.63	41.23
3	Ernakulam	8.77	33.07	24.30
4	Thodupuzha	12.93	75.58	62.65
5	Kothamangalam	9.05	46.51	37.46
6	Kanjirappally	2.63	38.15	35.52
7	Kottayam	7.19	33.82	26.63
8	Muvattupuzha	0.62	29.29	28.67
9	Pala	8.44	48.31	39.87
10	Marthandom	0.00	18.24	18.24
11	Mannarkkad	0.80	12.38	11.58
12	Palakkad	1.18	8.24	7.06
13	Thrissur	0.57	10.81	10.24
14	Kanhangad	0.53	17.60	17.07
15	Kozhikod	24.25	12.32	-11.93
16	Manjeri	1.77	14.26	12.49
17	Nilambur	2.24	13.89	11.65
18	Sreekandapuram	2.78	19.85	17.07
19	Taliparamba	0.77	14.75	13.98
20	Thalassery	0.02	27.79	27.77
21	Kottarakkara	1.48	53.38	51.90
22	Thiruvananthapuram	0.84	13.63	12.79
23	Adoor	0.00	28.61	28.61
24	Nedumangad	0.32	12.07	11.75
25	Pathanamthitta	0.00	32.35	32.35
26	Punalur	1.41	57.27	55.86
Total area (ha)	9347.99	5193.19	-4154.80	
Area under RRII 400 series (ha)	319.28	1460.79	1141.51	
Percentage share in total area	3.42	28.13	24.71	

Table 3. Adoption of multi- clones
(Percentage shares in total area planted under each regional office)

No	R O	2005	2010	Difference
1	Changanassery	4.50	47.61	43.11
2	Erattupetta	0.00	12.86	12.86
3	Ernakulam	0.00	0.02	0.02
4	Thodupuzha	0.00	3.05	3.05
5	Kothamangalam	0.00	12.74	12.74
6	Kanjirappally	11.39	31.00	19.61
7	Kottayam	0.00	16.97	16.97
8	Muvattupuzha	2.12	14.56	12.44
9	Pala	0.00	11.48	11.48
10	Marthandam	2.78	10.25	7.47
11	Mannarkad	0.00	1.99	1.99
12	Palakkad	0.00	18.76	18.76
13	Thrissur	0.00	13.86	13.86
14	Kanhangad	0.00	16.63	16.63
15	Kozhikode	0.00	31.02	31.02
16	Manjeri	0.00	16.71	16.71
17	Nilambur	0.00	8.19	8.19
18	Sreekandapuram	0.00	19.68	19.68
19	Taliparamba	0.00	16.03	16.03
20	Thalassery	0.80	12.61	11.81
21	Kottarakkara	0.00	7.20	7.20
22	Thiruvananthapuram	0.00	1.16	1.16
23	Adoor	1.58	28.18	26.60
24	Nedumangad	0.00	6.86	6.86
25	Pathanamthitta	10.88	34.54	23.66
26	Punalur	0.00	0.44	0.44
Total area (ha)		9347.99	5193.19	-4154.80
Area under multi-clones (ha)		95.17	792.57	697.40
Percentage share in total		1.02	15.26	14.24

and Nedumangad, where it accounted for 85.40, 85.05, and 80.68 per cent respectively of the total area planted during the year. It is to be noted that, RR11 105 remained as the most popular single clone under 14 Regional Offices by occupying more than 55 per cent of their total area during 2010. It is also observed that, unlike other regions, in Marthandom, area under this clone witnessed an increase of 53.21 per cent of the total area in 2010 compared to 32.49 per cent in 2005.

However, it can also be understood from Table 1 that no region witnessed a consistent pattern in the adoption of RR11 105. It is evident that, during 2005 this clone was highly popular in Thrissur (99.43 per cent), Nedumangad (99.30 per cent), Kanhangad (99.24 per cent), and Thalassery (99.18 per cent). However, the same trends could not be observed in these regions in 2010.

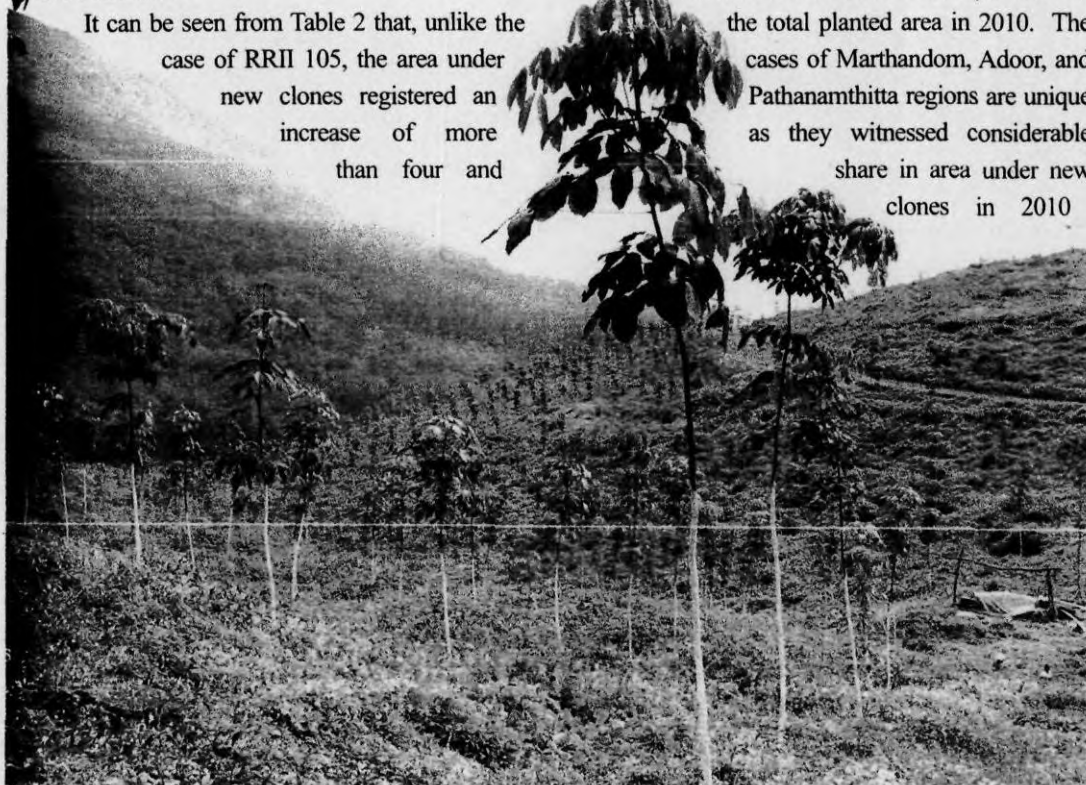
Adoption of RR11 400 series clones

Table 2 illustrates the extent of adoption of RR11 400 series clones under each Regional Office during 2005 and 2010.

It can be seen from Table 2 that, unlike the case of RR11 105, the area under new clones registered an increase of more than four and

a half times in 2010 compared to 2005. In the year of introduction these clones accounted for only 3.42 per cent, whereas in 2010 they occupied 28.13 per cent of the total planted area in the traditional region. Initially these clones were popular to a limited extent in six regions viz., Kozhikode (24.25 per cent), Thodupuzha (12.93 per cent), Kothamangalam (9.05 per cent), Ernakulam (8.77 per cent), Palai (8.44 per cent), and Kottayam (7.19 per cent) and in majority of other regions their share was only less than one per cent and in three of the regions (Marthandom, Adoor, and Pathanamthitta) they were absolutely absent. In contrast to this, in 2010 new clones witnessed significant popularity in all the regions especially in Thodupuzha (75.58 per cent), Punalur (57.27 per cent), and Kottarakara (53.38 per cent) while the lowest popularity was in Palakkad (8.24 per cent), Thrissur (10.81 per cent), and Nedumangad (12.07 per cent). As against the general trend, new clones registered the highest popularity in Kozhikode (24.25 per cent) in 2005 but this region was the only one where the popularity of these clones declined and reached the level of 12.32 per cent of

the total planted area in 2010. The cases of Marthandom, Adoor, and Pathanamthitta regions are unique as they witnessed considerable share in area under new clones in 2010



with 18.24, 28.61, and 32.35 per cent respectively of the total area when the popularity of these clones was totally absent in these regions in 2005. However, as in the case of RR11 105, new clones had also not exhibited a consistent pattern in their adoption across regions. It is very clear from Table 2 that the regions where new clones were popular in 2005 were not the same in 2010.

Adoption of multi-clones

Though the Rubber Board has been recommending multi-clonal planting since 1991 the response of growers to this had been lukewarm until 2005. However, since the introduction of new clones the response towards multi-clonal planting witnessed drastic change, which is obvious from Table 3. During 2005 multi-clonal planting was adopted only in seven regions with highest share in Kanjirappally (11.39 per cent) followed by Pathanamthitta (10.88 per cent). But in 2010 multi-clonal planting was adopted in all the regions and was most popular in Changanassery (47.61 per cent), Pathanamthitta (34.54 per cent), and Kozhikode (31.02 per cent). The availability of more high yielding clones could be the factor attributed to this phenomenon. Therefore, the area under multi-clonal planting increased to the level of 15.26 per cent in 2010 from 1.02 per cent of the total area planted in 2005. Nevertheless, multi-clonal planting is observed to be still negligible in the regions of Ernakulam, Punalur, Mannarkkad and Thodupuzha (Table 3). As in the case of RR11 105 and 400 series clones, multi-clonal planting had also not exhibited consistency across regions. This is obvious from differences in regions, which adopted multi-clonal planting in 2005 and 2010.

Conclusion

In the context of introduction of RR11 400 series clones for commercial cultivation in 2005, the paper examines the extent of adoption of clones during 2005 and 2010 under 26 Regional Offices of the Rubber Board. The clone RR11 105 had been adopted as a mono-clone until 2005 as it occupied 93 per cent of the total planted area in the traditional region. In contrast to this, multi-clones were planted only in one per cent of the total area during this year. However, subsequent

to the introduction of RR11 400 series clones the structure of clone adoption witnessed substantial changes across regions. As a result, the area under RR11 105 declined from 93 per cent in 2005 to the level of 56 per cent in 2010 and the highest decline was observed in Thodupuzha, Changanacherry, and Kanjirappally. In contrast to this, the popularity of new clones substantially increased to 28 per cent in 2010 compared to three per cent in 2005 and were highly adopted in Thodupuzha, Punalur, and Kottarakara. Though the Rubber Board has been recommending multi-clonal planting since 1991, it started influencing the small growers only since the release of new clones. This is more explicit from the increase in area under multi-clonal planting from one per cent in 2005 to 15 per cent in 2010. Multi-clonal planting was more popular in Changanassery, Pathanamthitta, and Kozhikode. As against the historical trends in the adoption of RR11 105, no clone exhibited a consistent pattern in its adoption across the regions since the release of new clones since 2005. It could be due to the changing perception of growers with regard clone preference as they are confronted with more choice of high yielding clones. Therefore, the results of the study assume relevance in understanding the contributory factors for the region-specific clone preferences.

References

- Ipe, V.C. and Haridasan, V. (1988). Adoption of improved planting materials in rubber smallholdings: An analysis. *Rubber Board Bulletin*, 23 (3): 9-12.
- Varghese, Y.A., Mercykutty, V.C., Panikkar, A.O.N., George, P.J. and Sethuraj, M.R. (1990). Concept of Clone Blends: Monoculture Vs. Multiclone Planting. *Rubber Board Bulletin*, 2 (2): 9-12.
- Veeraputhran, S., Siju, T., Joseph, J., and George, K.T. (2013 a). Adoption of RR11 400 series clones and planting density: A study of smallholdings in the traditional regions of India. Monograph, Rubber Research Institute of India, Kottayam.
- Veeraputhran, S., Siju, T., Joseph, J. and George, K.T. (2013 b). Adoption of RR11 400 series clones by rubber small growers. *Journal of Plantation Crops*, 41(2):209-213.
- Gireesh, T.G and Mydin, K.K (2013). On farm evaluation of RR11 400 series clones in smallholdings. *Rubber Board Bulletin*, 23 (3): 9-12.