

RECENT TECHNICAL ADVANCES IN RUBBER INDUSTRY IN SRI LANKA

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Natural rubber production in Sri Lanka has been declining steadily since 1978. From 155 000 MT produced in 1978, the annual rubber production has come down to a figure just over 112 000 MT in 1995. From the data available it is clear that the main cause for the declining yield is the poor agriculture management in estates. As a result, the following short comings which are directly related to yields have been identified from the rubber estates during the last 2 decades.

1. Maintenance of stands has been badly neglected and hence the average mature stand has dropped down to about 250 trees per ha from the expected figure of 500.
2. Percentage of immature rubber in estates have arisen from the accepted 18-20% to some times as high as 50%.
3. Most of the trees in the mature plots are affected with tapping panel dryness.
4. Poor quality planting materials have been used for planting, without following correct selection procedures at nursery levels.
5. Fertilizer application has not been done at recommended levels.

In addition to this, nearly 3000 - 4000 ha. of rubber land are going out of rubber mainly due to village expansion and crop diversification to crops such as tea, specially when the tea prices are attractive. The decline in production has been most severe during 1989 - 91 period. Between 1991 and 1993, the production figures were fluctuating between 104 000 MT and 106 000 MT. However, after the privatization of estates in 1993 there was a slight upward trend in production. The total production figure for the year 1996 was 112 500 MT, which is the highest annual yield recorded after 1990 (Fig. 1). This is a clear indication that new technologies are being adopted in the plantations now.

The only possibility of increasing annual production of rubber from a declining extent is by adopting new technology developed by the Rubber Research Institute. Generally, the deviation from traditional planting practices and moving towards newly developed productive techniques is fairly slow in Sri Lanka. However, in India eventhough the rubber plantations are only few decades old, they are using all proven newly developed techniques available around the world to increase

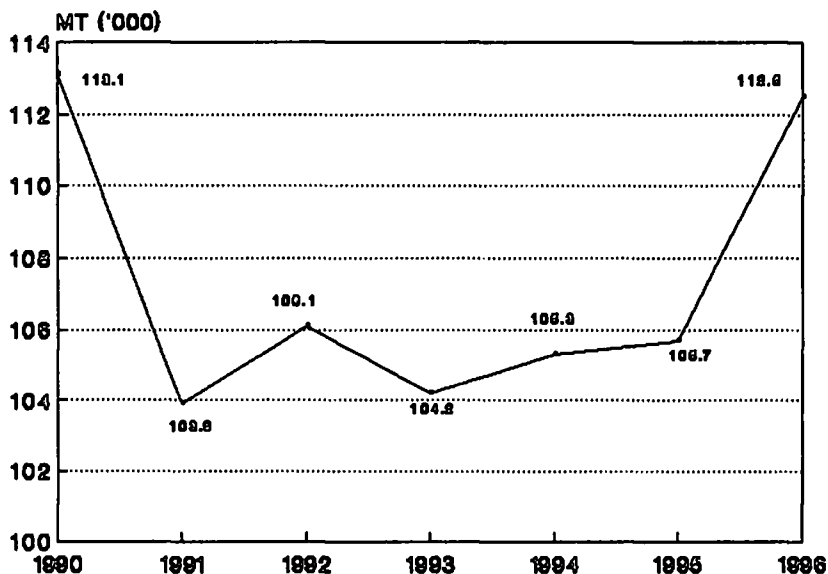


Fig. 1. Rubber production in Sri Lanka (1990 - 1996)

the productivity in their plantations. Planters in India who are with minimum B.Sc. Agriculture degree have more faith in the newly developed technology and are always keen to adopt such newly developed planting practices. As a result, India has been able to achieve the highest average productivity in the world, which is 1440 kg/ha/yr.

Situation in estates, particularly after privatization of the estates is improving. The planters are adopting new technologies in their rubber plantations and hence the production has improved tremendously in 1996.

The latest technology introduced to the rubber industry by the RRI, which will enable to increase the rubber production at least by 50% if properly applied are:

1. Use of high yielding clones.
2. Maintaining a satisfactory stand at maturity at 450-500 trees per ha.
3. Application of fertilizer according to Soil & Foliar analysis results.
4. Use of new bud grafting techniques.
5. Polybagging of plants to minimize mortality in dry weather.
6. $s_2 d_3$ tapping system to minimize the impact of tapper shortage.
7. Use of rain guards to minimize crop losses due to rain and to minimize TPD.
8. Control of leaf and root diseases by following correct agronomic practices.

The high yielding clones introduced by RRI are RRIC 100, 102 and 121. Out of these, RRIC 100 has been adjudged as the best clone planted under the 1979 International Clone Exchange Program. Not only yieldwise, but it is even resistant to many diseases and vigorous in growth. All these three clones give yields over 2500 kg/ha/yr compared to the traditional PB 86 clone which is still covering nearly 60% of the total plantation in Sri Lanka. Propagation of these clones in the plantations in Sri Lanka is highly successful and even slightly above the target.

RRI has also been able to introduce green and young budding techniques to the rubber plantation which could produce quality rubber plants in a short period of time like 8-9 months. Young budded plants also help to maintain a uniform stand in the field compared to bare root brown budded stumps. This technique is picking up very fast in the estates and among smallholders. All young budded plants are planted in polythene bags. Even green or brown budded plants raised for few months in polybags under special care, before planting in the field, enable farmers to minimize mortality of newly established plants specially in drought prone areas. This will enable to maintain the stand at 450 - 500 tree/ha with minimal infilling within the first 3 years.

Application of fertilizer according to soil and foliar survey based results will not only minimize the cost; but also prevents the possible poisoning of trees by the use up of excess nutrients while protecting the environment. Optimum results in this exercise could be achieved if the 4 main nutrient components are bought separately and mixed according to the RRI recommendation in the estate itself.

Laying rain guards to minimize rain interference on tapping in Dartonfield estate, enabled to achieve a record number of tapping days of 327 for 1996 compared to an average of 280 - 290 recorded in other estates of the country. This has not only increased the yield by 12% within a year; but also have nullified the need to do recovery tapping which is not only lowering the yield by 20%, but also is the main cause for the tapping panel dryness disease. The sealant for the rain guard developed by the RRI is perfect and the recipe of it is being used by our neighboring countries as well.

Performance of rainguards in Dartonfield 1996

	Dartonfield	Gallewatta (No. rainguards)	Nivitigalakelle (No. rainguards)
1. No. of normal tapping days	316	234	242
2. No. of late tapping days	11	50	48
3. Therefore total no. of tapping days	327	284	290
4. Estimated crop for 1996 Kg	20500	111600	38400
5. Recorded crop for 1996 Kg	21988	104907	32434
6. Therefore % increase of crop	7.25	-6.0	-15.5

In Dartonfield division, Apron type rainguards were fixed by sundry labourers without having any prior experience. Mixing of the sealant to the recipe given was also carried out by them. There were no insect attack on the polythene, theft or cattle damage to the polythene has been reported from the estate during this period. Tapping has also been done even on heavy rainy days by the tappers without complaints

Development of disease resistant clones and control of possible out breaks of common diseases by following correct agronomic practices is the effort of the Rubber Research Institute of Sri Lanka in controlling these diseases. We have been extremely successful in this exercise and at present except for plantlets in the nursery, no insecticides or fungicides are used for the rubber plantations in the field. However, in our neighboring countries every rubber plantation is aerial sprayed with fungicides twice a year at a cost of Rs.4500/- per ha/yr. Further, these fungicides specially copper based fungicides when aerial sprayed are extremely bad to the environment.

Rubber being a biological specimen, cannot be exploited indiscriminately. Sufficient time must be given to the tree to produce latex before it is tapped. Hence, stimulation, or any other vigorous way of extracting latex from rubber trees is not recommended any where in the world. In order to solve the problem of shortage of tappers to some extent, a half spiral once in 3 days tapping with 2.5% ethrel stimulation has now been recommended by the RRI. This is to extract the same amount of latex collected in s_2d_2 (half spiral alternate day tapping) in 3 days, thereby reducing the tapper requirement by 33%. This method is already followed successfully without causing damage to trees, in many estates. However, this technique is meaningless if rain guards are not used.

Rubber Factory effluent treatment method developed by the RRI, based on anaerobic and aerobic digestion coupled together has shown excellent results and the method has now been implemented in many factories. It is not only performing its function well, but is, also the most cost effective of all the effluent treatment methods used in Sri Lanka.

It is very clear that the only way to increase production of rubber in Sri Lanka inspite of the decline in extent, is to apply newly accepted technologies at all stages in the production process from the stage of land preparation for planting to uprooting of trees. The proven technologies have been developed long ago. But, the implementation is still fairly slow. Hence, Sri Lanka too must implement simple yet, effective technology to increase the productivity of our rubber lands. That will enable not only to increase the rubber production, but will provide a better environment for us to live in harmony as rubber is widely considered as the most environmental friendly agricultural crop grown in Sri Lanka.

Rubber products industry

Manufacture of value added rubber end products for both local consumption and for export have been on the increase since 1990. Consumption of raw rubber in both latex and dry forms have increased from 42 000 metric tons previous year to 60350 metric tons in the year 1996; which is the largest jump shown in the rubber consumption figure in the history of Sri Lanka. The break-down of rubber used in different products sectors are shown in the table below.

Production output of rubber sector by product type (1996)

Production	NR used (MT)	Product output	
		Unit	Quantity
Tyre retreading	5,600	MT	7,460
Industrial solid tyres	12,900	MT	25,800
Pneumatic tyres & tubes	6,100	MT	15,250
Latex Dipped products (Gloves)	19,230	MT	20,250
Latex Foam Rubber	1,500	-	N.A.
Foot wear	7,860	MT	13,100
Flooring	5,000	-	N.A.
Other rubber products*	2,160	-	N.A.

* Castor, Hose, Sheeting, Rubber Bands, Technical Products etc.

The main feature of this consumption figure is that the improvement shown in the dipped latex based products industry. In this Sector, consumption has increased from 14,000 metric tons to nearly 20,000 metric tons during this year, which is mainly due to the fact that Sri Lanka has now become one of the best locations in the Asian region for such industries. The main attraction for the dipped rubber products manufacturers in the country are:

1. Low FOB price of latex.
2. Cheap labour.
3. Low electricity tariffs
4. Tax concession and other incentives offered by the BOI.
5. Technical support given by Institutions such as RRI, CISIR and the University of Moratuwa.
6. Availability of latest techniques to maintain and certify quality of the end products, such as the latest techniques for the assessment of leachable protein levels in such products.

From these figures it is clear that solid tyre industry has consumed 12 900 m.tons of rubber for the production of both large and small solid tyres. In this sector, Sri Lanka cater to nearly 20% of the world requirement and is the largest single producer of solid tyre in the world today. Progress made in the pneumatic tyre and tube industry and in the tyre retreading industry is also remarkable. Major motor car manufacturers are now planning to invest in Sri Lanka within the next few months. With this trend in progress shown in the rubber products manufacturing industry it is believed that Sri Lanka will consume 50% of the rubber production by the year 2000 for the local consumption. There are couple of new treated rubber wood based export oriented projects to be started soon to ensure a realistic price for the old trees uprooted by the small holders; so that they can cover up their replanting costs without depending totally on the subsidy paid by the Rubber Development Department. While producing value added products, Sri Lanka will continue to produce top grades of raw rubber such as sole crepe and pale crepe in more acceptable forms of manufacturing and packaging to the end-user. They are the only grades of rubber produced anywhere in the world with a very low level of proteins and hence safest for making medical and infant products. This will help to earn more foreign exchange for the development programme of the country in the next century.

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