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Ministério da Agricultura, do Abastecimento e da Reforma Agrária – MAARA  
Empresa Brasileira de Pesquisa Agropecuária – EMBRAPA  
Centro de Pesquisa Agroflorestal da Amazônia Oriental – CPATU

# **REDUCING SALB RISKS-CULTIVATING RUBBER IN ESCAPE AREAS**

**BELÉM, PARÁ**  
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# **REDUCING SALB RISKS-CULTIVATING RUBBER IN ESCAPE AREAS**

by

*Prof Eurico Pinheiro*

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## Reducing SALB Risks – Cultivating Rubber in ‘Escape Areas’<sup>#</sup>

*Eurico Pinheiro\**

The traditional rubber growing areas in the Amazon are characterised by a rainy season that is well distributed throughout the year. This gives the trees an adequate supply of water without an accentuated water deficit.

In these areas of high humidity, the development of South American Leaf Blight (SALB), caused by the fungus *Microcyclus ulei* (P. Henn.) Arx, is prevalent. This is, at the present, the most serious disease of the rubber tree in the Occident.

The large number of pathogenic races, where more than 50 strains have been found, have eliminated up to this moment, all attempts to produce, through genetic improvement an *Hevea* clone with two important agronomic characteristics that is, production and resistance together in the same clone.

The problem became even more economically important when certain clones, chosen because of their resistance to *Microcyclus ulei* in certain ecological areas, were transported to other regions and the new regions became totally susceptible to the disease. This is one of the causes that compromised the success of the government’s incentive programmes for rubber tree growing in the Amazon, such as PROBOR.

Through this programme the government financed more than 120 000 ha of rubber planting in humid tropical areas of the Amazon and, especially because of SALB, only 25% of the plantations reached maturity and even these produced low levels of yield.

The attempts to control SALB in matured rubber trees by chemicals were unsuccessful. Even large companies, including Goodyear and Pirelli, using modern equipment such as therm-fog (Tifa-Dynafog) were not successful. This led them to abandon the rubber growing for pasture.

Crown budding may be the solution to cultivate rubber trees in the humid areas but more studies must be done on the interaction of the crown and panel.

Studies done before by EMBRAPA/FCPA (Faculty of Agriculture) in southeast Maranhao State and more recently by EMBRAPA-CPATU, associated with the company SIMPEX-CODEARA in the north of Mato Grosso State, proved

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that the rubber tree can grow without *Microcyclus ulei* in the marginal areas, now called 'escape areas'.

In the Amazon 'escape areas' there is a period of heavy rainfall followed by a dry spell for 4 or 5 months, where the water deficit reaches 350 mm a year. In this dry period, humidity reaches 60%, and this 'wintering' experience is not conducive for the growth of the pathogen *Microcyclus ulei* in the epidemic form.

The 'escape areas' represent an excellent area for the reactivation of heveaculture in the Amazon. There are millions of hectares distributed in the Oriental Amazon and depending on soil conditions, may be used for heveaculture. Many new plantations located in the south of Para State, southeast of the Maranhao State and the North of Mato Grosso State, show a great potential for rubber in the Amazon.

The company SIMPEX-CODEARA established in the north of Mato Grosso State, a plantation of 1000 ha using clones RRIM 600, RRIM 701, GT 1, PB 235 and PB 260, as well as the Amazon clones IAN 717, IAN 873 and IAN 3087. A part of this area is already being tapped and the economic performance of these clones is satisfactory, even though water stress interferes with the rate of growth and production of the rubber tree. It is important to note that these rubber trees were planted in an area of degraded pastures and the rubber trees contribute to the recuperation of these areas.

The EMBRAPA-CPATU in a joint venture with SIMPEX-CODEARA has established in this plantation a small experiment station for heveaculture. A series of experiments are being realised, especially to shorten the immaturity period, for here, the rubber tree can only be tapped when it is 8-years-old. The selection of clones resistant to water stress, planting technics, irrigation systems, tapping systems, phytosanitary controls, are some of the areas that are being studied.

## CLIMATE AND SOIL OF THE REGION

The SIMPEX-CODEARA plantation is localised at the coordinates of 10° 28' South and 50° 30' West. The region has a rainy season from October to April, followed by a dry period from May to September. The total annual rainfall ranges from 1900 to 2000 mm. The average annual temperature is 26° C, but during the dry season, the higher temperatures contribute rapid evapotranspiration, exactly when the plant is wintering. At this period the rubber trees need the most water. At CODEARA, the annual water deficit is 250 mm.

In the 'escape areas' located in the south east of Brazil, Sao Paulo for example, wintering occurs in the oldest months of the year causing lesser water stress on the plants. In the 'escape areas' of Sao Paulo, the rubber trees are tapped when they are 7-years-old, while in the Amazon the trees are tapped on the 8th year.

Latossolic soils, which are yellow and red-yellow, predominates the Amazon 'escape areas'.

### PLANTING MATERIALS

In the past the 'escape areas' in the Amazon used only planting materials of Amazonic clones. The utilisation of oriental clones is more recent and the oldest block is completing 5 years of tapping. The oriental cultivars most used are RRIM 600, RRIM 701, PB 235, PB 260 and GT 1.

In the experiment plots 25 different clones (twelve of which are Asiatic clones) are being tested. During the immature period and in the rainy season the oriental clones experienced a small defoliation caused by *Microcyclus ulei* in some few flushing; the Amazonic clones that tolerate the disease does not experience a loss of leaves. The Amazonic clones which were tested in the 'escape areas' with good yields are IAN 717, IAN 873, IAN 2880, IAN 3087 and IAN 3156.

In the 'escape areas' of Sao Paulo, this clones used mostly are RRIM 600, RRIM 614, PR 261, AVROS 1518, GT 1 and PB 235. RRIM 600 predominates the other clones.

### PLANTING

In the 'escape areas' it is very important for planting to take place during the beginning of the rainy season. So that the rubber trees has 3 or 4 months of abundant rain.

Todate, the type of stock buddings used is in the form of polybag core stock budding with 2 mature flushings, using the method of deep planting. By this method the plant has good resistance to the dry season that follows.

### PRODUCTION

The tapping systems used mostly was periodic tapping with Ethephon application at a concentration of 2.5%. The tapping rest of two months coincided with wintering. The low frequency tapping system was found to be economical for wages are low in the region. In the Amazon, the slow growth of the rubber trees contribute to the late start of tapping which is around 8 years.

Yield data for similar clones in the Amazon and in the Ivory Coast where the trees does not suffer any water restriction, show that in the first 4 years, the average production in the Amazon was only 63% of that of the Ivory Coast, but there are some Amazon clones such as IAN 3087 and IAN 3156 in the 'escape areas' of the Amazon which produce comparable yields to that of the oriental clones of the Ivory Coast.

## PROBLEMS ENCOUNTERED IN THE 'ESCAPE AREAS'

### Diseases

Even though the rubber tree is protected from *Microcyclus ulei* in the 'escape areas', other diseases have been registered in their epidemic form.

The thread blight, a disease caused by the fungus *Koleroga noxia*, has caused, during the rainy season, some defoliation at the base of the crown. RRIM 600 and RRIM 701 clones are the most susceptible to the disease.

The fungus *Botryodiplodia theobromae* associated with scorching of the bark caused by the blazing afternoon sun, cause a necrosis in the stock-scion union where the snag has died-back, called 'spear head based stem rot'. In the Amazon 'escape area' this affects more than 70% of the stand of new plantations. But now, the use of the deep-planting has completely controlled the problem.

In Sao Paulo other diseases like *Colletotrichum gleosporioides* and *Oidium hevea* have caused damage. But the worst disease is 'Antracnosis' which can destroy the renewing bark in the tapping panel. It is also caused by *Colletotrichum gleosporioides*.

In some 'escape areas' of Sao Paulo, irradiation frost is a serious meteorologic problem.

### Pests

The lace bug (*Leptopharsa hevea*, Hemiptera: Tingidae), which are the most serious plague, attack the rubber tree in the 'escape area'. The parasites attack recently matured leaves of the rubber trees in September and October causing premature leaf fall. During the period of high relative humidity (December and January) the new foliage permits an intensive attack of *Microcyclus ulei*, eliminating the 'escape areas'.

Due to the work of Nilton Junqueira, the population of the lace bug has been routinely controlled in large areas of Mato Grosso State by the application of spores of the fungus *Sporothrix insectorum* that parasites both the adult form and the larva of the lace bug.

Recently the population of mites has increased in the Amazon 'escape areas', principally the *Tenuipalpus hevea*, causing serious leaf damage with severe defoliation, and affecting the yield of rubber. This mite especially prefers PB 235 clones which severely attack them. Other clones in the adjacent blocks, with their foliage in some phenological stage, were not attacked.

## NATURAL RUBBER PRODUCTION IN BRAZIL

The Amazon completely lost its hegemony in the production of natural rubber compared to Sao Paulo, Bahia and Mato Grosso States which dominate production.

In 1994 Brazil consumed 134 000 tons of natural rubber, of which they only produced 43 000 tons. Of this amount only 6000 tons were wild rubber from the Amazon jungle.

Economic reasons contributed to the decline in the production of wild rubber and have nothing to do with the destruction of the forest. Wild rubber cannot compete in price with plantation rubber even with the protection it receives from the Brazilian government.

In 1994 Sao Paulo was the largest producer of natural rubber with a total of 13 000 tons. It is important to note that only 30% of the 36 000 ha planted have started to produce rubber.

In the state of Bahia many of the plantations have very good micro-climatic conditions and even though the material used were Amazon clones of only moderate production, such as FX 2261, FX 3864 and IAN 873, it managed to produce 8000 tons of natural rubber.

It is estimated that Mato Grosso State has 70 000 ha planted with rubber and in 1994 it produced 7000 tons of natural rubber. Even in the 'escape area' of Mato Grosso, the plantations were planted with Amazon clones. Only the new plantations such as Michelin, Codeara and others used oriental clones.

In the 'escape areas' of the Oriental Amazon which are especially designated for rubber plantations, there are large areas of pasture used for cattle. In very poor areas the farmers with smallholdings practise shifting agriculture producing as small amounts of grains.

In this vast region heveaculture could change this situation and keep the smallholders on the land by improving their social and economic status as well as the situation of the area.