

Rubber Tree Production Guide

I. GENERAL DESCRIPTION OF THE CROP

Rubber tree is a tropical South American tree widely cultivated throughout the Tropics and yielding a milky juice that is a major source of commercial rubber.

Rubber tree is robust, perennial crop scientifically known as *Hevea brasiliensis* Muell. And belong to the family of Euphorbiaceae and the most economically important member of the genus Hevea.

The plants would be 'tapped', that is, an incision made into the bark of the tree and the sticky, milk colored latex sap collected and refined into a usable rubber.

Its product is called natural rubber (NR) which has an elastic property.

Natural rubber exists as latex, a milky white sap, which is a colloidal suspension of rubber particles in liquid form.

II. CROP VARIETIES

Hevea brasiliensis

Hevea species

1. *H. nitida*
2. *H. benthamniana*
3. *H. rigidifolia*
4. *H. spruceana*
5. *H. pauciflora*
6. *H. guianensis*
7. *H. camargoana*
8. *H. camporum*
9. *H. microphylla*

RECOMMENDED RUBBER CLONES

1. Rb-99-01 (RRIM 600)
2. Rb-99-02 (PB235)
3. Rb-99-04 (PB217)
4. Rb -00-05 PB 260
5. Rb-00-06 PB 330
6. Rb-00-07 PB 311
7. RRIM 628

8. RRIM 712
9. RRIM 901
- 10.Rb-99-03 (USM 1)

III. CULTURE AND MANAGEMENT

Selection of Site for Rubber Planting

- Flat/plain lands should be well-drained with deep water table
- Gently sloping/undulating to rolling terrains.
- Soil pH of 4.5-6.5 (ideal pH is 5.0)
- Good soil aeration
- Topsoil containing abundant organic matter
- Availability of transportation/accessible
- Availability of labor force

Climatic requirements:

- Minimum temperature is 20°C
- Maximum temperature is 34°C
- Average temperature is 25-28°C
- 80% atmospheric humidity with moderate wind speed.
- Average rainfall of 2000 mm – evenly distributed throughout the year.
- Bright sunshine amounting to about 2000 hrs. At the rate of six hrs/day.
- No distinct dry and wet seasons.

Source of planting materials

- Should be obtained from registered and reliable centralized or commercial nurseries that adopt good production practices.

Type of planting materials

- Green budded plants are preferred over brown budding.
- Budding in polybags is preferred over budding raised from bare-root budded stumps.
- It is recommended to plant two to three whorl polybag buddings.

Land Preparation

- In the areas with big trees, or in second growth forest, clear the under growth first to facilitate cutting of bigger trees, then cut the big trees into logs and remove these from the site. Cut and remove the smaller trees found along the expected rows of rubber.
- In cogonal areas, remove the cogon grass completely by using recommended herbicides since it can hinder or stunt the growth of rubber and possibility of burning during summer/dry months.
- In hilly areas where cultivation is difficult, remove the cogon and other grasses/trees along the rubber rows. However, if there is a sufficient resource, then massive clearing is likewise recommended.
- In flat but cultivated areas, plow the area twice before laying out.
- In hilly lands, terracing is encouraged following the contour lines. Terracing in hilly areas must be done very carefully, if not it will just promote soil erosion.

Lay-outing in Flat Lands

Rows of rubber are usually set at east-west orientation to obtain maximum exposure to sunlight. This is also to provide highway for major winds, the east west monsoon winds which help in drying the rubber trees.

Lay-outing in Hilly Areas

Contour lining is highly recommended on hilly areas of more than 20° gradient by marking the planting points in level lines across the slope. A line of average slope is selected dividing the slope according to the distances between the rows of rubber. To locate the level lines along the slope, an A-frame is used.

Planting Distances

Topography	Distances (m)	No. of trees
Hilly (follow contour planting)	9.0 x 2.5	444
	8.0 x 2.5	500
	10.0 x 2.0	500
	11.0 x 2.0	454
	8.0 x 3.0	416
Flat or undulating	5.0 x 4.0	500
	6.0 x 3.0	555
	7.0 x 3.0	476
	8.0 x 3.0	416

Avenue system	12.0 x 2.0	416
	10.0 x 2.0	500
	11.0 x 2.0	454
	9.0 x 2.5	444
	24.0 x 2.0 (double rows)	416

Steps in Planting

Plantable hevea buddings conditions are: matured top leaf whorls, or dark green leaves in color, first leaf whorl for polybag buddings and two leaf whorls for ground nursery raised budding, healthy and vigorous in appearances.

1. Measure the size and the deepness of the hole and the height of the plant up to the budding union.
2. The bottom of the bag should be completely removed or cut first before placing it in the hole.
3. The planting material is carefully placed in the hole, and with the sharp knife, cut the plastic bag vertically starting from the bottom going up.
4. Pull the plastic sleeve and backfill the hole with the fertile soil mixed with small amount of complete fertilizer.
5. In compacting the backfilled soil, it should be in a slight manner to allow air circulation within the soil particles.

Fertilizer Application

Fertilizer Application Schedule

Period of Planting	Amount (14-14-14)	Placement from the base or broadcast all over the area around the base up to 4-5 meters radius
1st-2nd year	125-200 g/t/yr	30 cm
3rd-4th year	250-400 g/t/yr	60 cm
5th-7th year	500-600 g/t/yr	90 cm
8th-10th year	500-700 g/t/yr	Broadcast
11th-12th year	700-800 g/t/yr	Broadcast
13th and beyond	900-1000 g/t/yr	Broadcast

Weed Control and Management

Weeds in rubber farms can be controlled by line weeding, slashing of weeds in the entire plantation, round/ring weeding, and the use of herbicides either in line weeding or entire plantation. Weeds in the rubber areas must be minimized or controlled to prevent stunted growth of the rubber trees and burning during the dry season. Cogon or *Cylindrica imperata* is enemy number one in rubber farming.

Pruning

The purpose of pruning is to develop a smooth trunk without branches or large scars on the stem/trunk to a height of 2.5-3.0 m from the ground level. This would result to uninterrupted tapping later on. Pruning/cutting the top portion of the trees is not a recommended practice.

Branch Induction

Branch induction is made on trees at least two-three years old after planting using the double blade ring-cut device. This is done by inserting the stem in the device above the cluster of buds about 2.5 m from the union. This can be done by turning the device around the bark penetrating the wood. This is to induce more branches to grow. However, allow only 3-4 branches to develop.

Methods of propagation

Rubber is best grown in plantation using vegetatively propagated seedling by budding.

This type of propagation uses considerable amount of budwood which is produced in special agricultural structure called budwood garden. The budwood garden has to be true-to-type and mixture per plot should be avoided.

Disease Control

Application of fungicide solution on trees infected by moldy rot and black stripe and soaking of tapping knife in a fungicide solution every after tapping the infected tree. For other diseases such as stem bleeding follow same treatment.

New Developments in Rubber Research

- Micro-cuttings in Indonesia and France
- On-going studies on Somatic embryogenesis and Micro-cuttings at USM and France
- DNA Fingerprinting for Rubber Identification USM and France
- Coming -in of new clones. PB 350, PB 359, RRIM 2001, 2002, 2023, 2024, 2027,

IV. HARVESTING

LATEX HARVESTING

1. Opening of Tapping

Based on circumference not by the age of trees. Using a template, trees with girth or circumference of 45 cm 18 inches (measured at 150 cm (60 inches) from the ground is ready for tapping.

2. Slope and direction of tapping cut

The slope of the tapping cut for budded trees is 30 degrees with the direction of tapping cut is from high left to low right.

Height of opening the tapping cut

3. 150 cm from the point of union.

4. Length of tapping cut

Cut should not exceed more than $\frac{1}{2}$ of the trunk especially on newly opened trees for cutting.

5. Depth of tapping cut

To obtain more latex, tapping should penetrate near the cambium leaving one mm thickness uncut bark away from the cambium.

6. Bark consumption

Normal consumption of 2 cm for virgin bark and 2.5 cm for renewed bark per month.

7. Frequency and intensity of tapping

Tapped every other day (d2 – 100%), tapped every third day (d3-67%) and tapped every fourth day (d4-50%).

8. Tapping task

600 trees per tapping on flat or undulating land, and it could be reduced on older trees, hilly terrain, or on high tapping cut.

9. Time of tapping

Preferably early in the morning because of high turgor pressure to obtain more production.

10. Number of tapping days

It should maintain the number of tapping days per month or per year because it has a strong bearing on the productivity.

VII. REFERENCES

ROMULO L. CENA, Ph.D.

Director, Philippine Industrial Crops Research Institute

USM, Kabacan, Cotabato

Prof. Rogelio C. Testado

Prof. Anita M. Testado

College of Agriculture USM, Kabacan, Cotabato