RUBBER PLANTATION ESTABLISHMENT



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What is rubber?

Rubber (*Hevea brasiliensis*) has a high export potential in the Philippines and is rated one of the most profitable agro-industrial ventures in this country.

Rubber has varied industrial, technological, and domestic uses today. It is used in rubber tires, flexible pipes, shoes, gloves, mattresses, bags, upholstery, rain coats, insulated floorings, tennis and golf balls, and pillows, among others.

Proper cultural management should be strictly followed during the immature stage (1–6 years after planting) to hasten the productive stage of the rubber trees and thus, provide the farmer a bigger income at an earlier time.

What are the cultural management practices in establishing rubber plantation?

Land preparation

Various types of lands are utilized for rubber production, (i.e., flat lands, hilly and mountainous lands, forest areas, and cultivated lands). Land preparation does not differ much except between flat and hilly lands.

In areas with big trees, in virgin forest, or in second growth forests, clear the undergrowth first to facilitate cutting of bigger trees. Cut the large trees of economic value into logs and remove these from the site. Cut and heap the smaller trees or trees with lesser economic value along the expected rows of rubber.

Minimize burning to avoid the loss of the organic matter and humus in the soil.

In cogonal areas, remove the cogon grass (*Imperata cylindrical*) completely since it can stunt the growth of rubber. In hilly areas where cultivation is difficult, remove the cogon along the rubber rows only.

In flat but cultivated areas, plow the area twice before laying out.

In hilly lands, prepare the land following contour lining and land terracing.

Laying out in flat lands

Set the rows of rubber at an east-west row orientation to get maximum sunlight. Make the longest boundary line along the eastwest orientation as a convenient base line.

Use the following for lining: two pieces of rope of at least 100 m long compass, measuring tape, and bamboo sticks (at least 1 m long). Use one of the ropes as a base line and the other as a guide line.

Laying out in hilly lands

Use contour lining in hilly lands of more than the 20 degrees gradient. Mark the planting points in level lines across the slope. Select a line of average slope and divide the slope according to the distance between the rows of rubber.

To locate the contour lines along the slope, use an A-frame. Mark the distance between rows with a stick and place the A-frame level at the base of the guide stick. Adjust the legs of the A-frame until the bubble in the carpenter's level floats to the center. Making the A-frame



Center a stake between the legs of the A-frame to mark the planting holes.

After laying out the contour lines along the slope, cut the planting terraces are necessary to prevent soil erosion and make tapping convenient. Cut the soil back to the hill 1.0-1.5 m from the planting guide stick with a drop of 25-50 cm to the back of the terrace.



Rubber Plantation Establishment (3)

Planting distance

Distance of planting largely depends on soil fertility, type of clones to be planted, typed of planting materials, and plant population density.

The Philippines Recommends for Rubber (1997) cites the following distances for planting rubber.

| Type of Land | Distance (m) | No. of Trees/ha |
|--------------------------|---|--|
| Hilly (contour planting) | 10.0 x 2.0 (avenue) | 500 |
| Flat or undulating | 5.0 x 4.0 (rectangular) 6.0 x 3.0 (rectangular) 12.0 x 2.0 (avenue) 10.0 x 2.0 (avenue) 8.0 x 2.25 (avenue) 24.0 x 2.0 x 2.0 (avenue, double row) | 500 555 416 500 555 416 |

Holing

Hole size and shape depend largely on soil conditions and planting materials. Compact hard soils need bigger holes than loamy soils. Likewise, large planting materials need bigger holes than smaller ones. Generally, however, the planting hole should be 24 cm x 30 cm.



Holes are made with a hole digger.

Rubber Plantation Establishment

Planting

Plant preferably when rainy weather is expected.



Correct planting method to prevent development of elephant foot.

Transplant the budded seedling when the leaves from the second top storey are fully expanded, dark green, and mature.

Cut the bottom of the bag with a sharp knife and make a vertical cut from the bottom of the plastic sleeve, taking care not to damage the lateral roots. Lower the seedling into the planting hole then pull the plastic sleeve upward and fill the hole with top soil or any fertile soil.



Elephant foot in rubber hinders tapping near the ground.

Fertilizer management

Fertilize the young plants to give them a head start over the weeds. During the first three years of the plantation, complete nutrition must be given to the trees.

Base fertilization on soil and tissue analysis. In the absence of the analysis, use the following general recommendation:

| Time of Application (Year after Planting) | Amount (14-14-14) g/tree/year* | Placement from the Base (cm) |
|---|-----------------------------------|------------------------------------|
| First | 125 | 30 |
| Second | 250 | 60 |
| Third | 500 | 90 |
| Fourth | 500 | 120 |

* Applied every six months in equally divided dosage.

Cover cropping

Cover cropping is the establishment of leguminous plants before, during, or after planting rubber. Cover crops suppress weeds and augment soil fertility, thus reducing the cost of weeding and fertilizers. They also converse soil moisture, thus creating favorable growing conditions for the rubber trees. In hilly areas, they minimize soil erosion.

Weed management

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Weed control is indispensable in the cultural management of immature rubber trees. When trees are immature, weeds usually grow luxuriantly because the canopy of rubber is still limited. Inadequate weed control at this stage, particularly when cogon is present, may delay the maturity of rubber and expose the plantation to fire hazard especially during summer. Cogon grass does not only compete for nutrients and light but also secretes allelopathic substances which restrict the growth of rubber (Mercado, 1986 as cited by CEMARRDEC, 1990).

Weeds can be controlled chemically, mechanically, or manually. Chemical weed is more practical and less expensive especially in rolling or hilly areas. Use herbicides such as glyphosate (Round-up) to control cogon and other grasses. Glufosinate can be used for mixed weeds.

Manual weeding can be done by slashing, line weeding, or ring weeding. In slashing, the weeds of the entire plantation are cut, while in line weeding; only weeds along the rows of rubber are cut. In ring weeding, weeds around the base of the plants are cut.

Replanting

Replant only up to the second year of plantation establishment so the replants can develop fully before the canopy closes. Use polybag buddings that are of the same age as that of the initial plants in the field.

Pruning

Prune trees to a height of 2.0-2.5 m to ensure the development of a smooth trunk without branches or large scars.

For polybag buddings, allow the plant to grow without branches until 2.0-2.5 m from the union, then prune.

Prunning also allows the development of a balanced canopy. Maintain 4–5 well-spaced branches to prevent wind damage.

Branch induction

Some clones grow branches late and become spindly without branches. Such slender-stemmed trees are susceptible to wind damage.

Induce these trees to branch artistically by making two-ring incisions immediately above a whorl of bud eyes about 2.5 cm from the union of an 18-month old rubber tree. Allow only 4–5 vigorous and well-spaced branches to develop. This technique widens the girth of the tree which helps the tree to resist wind damage.



The branch induction technique

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Intercropping in rubber

Intercropping various crops during the immature stage of rubber provides alternative sources of income to small farmers. It also reduces to less than 50%, the cost to establish and maintain rubber during its immature stage. In addition, intensified cropping controls weeds and improves soil properties especially when the intercrops are fertilized.

The most common intercrops with immature rubber trees are peanut, upland rice, corn, sorghum, mungbean, soybean, sweet potato, pineapple, and squash.



Upland rice and corn as intercrops for rubber



Banana and pineapple as intercrops for rubber

Rubber can also be intercropped with perennial crops like durian, rambutan, lanzones, coffee, calamansi, and banana. These intercrops can be grown up to or even beyond the productive years of rubber.

You can adopt the most profitable crop combinations to increase farm income without sacrificing the growth and yield of rubber.

What are the factors to consider in selecting your intercrops?

The selection of intercrops for the immature rubber trees depends on several factors. These include:

- 1. Terrain of the plantation. In flat and slightly-sloping areas, use intercrops such as legumes, cereals, and sweetpotatoes, which generally require land preparation and interrow cultivation. In hilly areas, use intercrops such as pineapples which do not require intensive cultivation.
- 2. Age of rubber. For three-to five-year-old rubber trees use intercrops such as mungbeans and pineapples which are slightly tolerant to shading. Pineapples can be grown until the fourth year after planting of rubber.
- 3. Distance of planting. Close planting distances like 4 m x 5 m, 3 m x 6 m, or 4.5 m x 5.0 m are not suitable for intercropping. Instead, use the avenue planting distances (2 m x 24 m double row). They expose the intercrops to sunlight particularly in east-west row orientation. Under these conditions, intercrops can be grown favorably even up to five years after planting of rubber.
- **4. Planting season.** Plant upland rice during the wet season and corn and peanut during both wet and dry seasons. Use sorghum, soybean, and mungbean during the dry season.

5. Optional scheme of intercropping. Annuals and biennials are commonly selected as intercrops. Alternatively perennials may be chosen. The selection of perennial crops is dependent on soil and climatic conditions, and prevalence of pests and diseases, among others.

Rubber can likewise be planted to marginal areas as a highyielding value crop to gradually replace poor-yielding, shortterm crops such as monoculture corn. This practice can improve land productivity and profitability in the long term.

Livestock and poultry such as sheep, chicken, and turkey can also be integrated in the production system to supplement a farmer's income during the unproductive stages of rubber.

The schemes offer an advantage of not disturbing the rubber while cultivating the intercrops and improving soil fertility. Furthermore, these encourage rubber trees to grow faster and be trapped earlier than those trees in monocropped plantations.



Sheep integrated in rubber plantation

GEOGRAPHICAL FLOW



To date, region 12 is serving four markets for the rubber industry namely: STANDECO, PIONEER, FARMA, MRDI and DAVCO and is targeting other markets as means of expansion.

GOVERNMENT SUPPORT TO THE INDUSTRY

INSTITUTIONAL SUPPORT

- A priority crop under the High Value Crop Development Program of the DA-RFO 12;
- Technical support from DA-RFO 12;
- Continuous marketing assistance from DA-Agribusiness and Marketing Assistance Division Regional Field Office 12 through market matching activities; unfailing support to the producers and processors by inviting them to participate at exhibits.

10 Rubber RDE projects in Mindanao, funded by the Bureau of Agricultural Research;

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- 1. Developing Baseline Information System for the Philippine Rubber Industry;
- Potential Major Diseases of Rubber: Determining the incidence and Distribution Profile of Tapping Panel Dryness, Corynespora Leaf Fall, and SALB in rubbergrowing provinces of the Philippines;
- 3. CPAR on White-Corn based Farming System under Newly Developed Rubber Plantation in South Cotabato;
- 4. CPAR: Rubber-based Farming Systems in Western Mindanao;
- 5. Rapid Propagation of Rubber via Somatic Embryogenesis;
- 6. Developing Molecular Marker Kit for Identification and Authentication of Hevea Clone;
- 7. Rubber Development Program for Southern Mindanao;
- 8. Evaluation and Production of Promising Clones of Rubber Using Improved Nursery Management Practices in Mindanao;
- 9. Adoption of Improved Technology on Rubber Nursery for the Production of Quality Planting Materials and;
- 10. CPAR: Rubber-based Farming Systems in Basilan.

ISSUES AND CONCERNS

Smallholders

- Checking quality of Inputs (i.e varities)
- Management of Plantation
- Processing of latex
- Marketing
- Tapping Panel Dryness, Corynespora Leaf Fall
- Due to the slow rate of replanting and new planting programs, the Philippines will experience shortage of about 20,000– 30,000 tons annually
- A small rubber farmer does not have the technical knowhow of producing quality rubber. Their produce, the cuplump, is the lowest form of marketable rubber
- No long-term viable and affordable loan scheme

RUBBER PRODUCER/BUYERS

Butch Pacheco

New Bulatukan, Makilala, North Cotabato c/o Municipal Agriculturist's Office Contact # 0916-514-3393 Product Form: Semi-Processed

Anesto Cabacungan, Sr.

Poblacion, Makilala, North Cotabato c/o Municipal Agriculturist's Office Contact # 0916-514-3393 Product Form: Semi-Processed

Mindanao Rubber Development **Industries Corporation**

Malasila, Makilala, North Cotabato Contact Person Jessica Sia Su Contact # 082-221-4881 Fax 221-4880 Product Form: Processed

Magnet Integrated Rubber Corp.

Magpet, North Cotabato c/o Office of the Provincial Agriculturist Contact # 064-278-7019 Product Form: Raw

VARARBEMCO

Cabantao, Rosario, Agusan del Sur

RARRFMCO Prk. Marasigan, Sta. Cruz, Rosario, Agusan del Sur

MEOHAO Farmer Beneficiaries MPC Meohao, Kidapawan City

Vilhea Trading Malabuan, Makilala, Cotabato

TNP Agricultural Development Cornoration

Sampaguita St., Juna Subd., Matina, Davao City

Pioneer Enterprises 114 C. Bangoy St., Davao City

SCARBIDICI Sta Clara Lamitan

UWARBMPC Cabunbata, Isabela

TARRIDC Tumajubong, Sumisip

JCA Agrarian Reform Beneficiaries Multi-purpose Cooperative Agusan del Sur

United Rubber Planters

Bukidnon

Producers Association Bukidnon

RIMFABEMCO Compostella Valley

SACARBEMCO Compostella Valley

Arakan Multi-purpose Cooperative Cotabato

Magnet Intergrated Rubber Coonerative Cotabato

Malasila Multi-purpose Cooperative Cotabato

Matalam Rubber Planters Intergraded Cooperative

Cotabato

North Cotabato Rubber Development Coonerative Cotabato



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