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DEPARTMENT OF AGRICULTURE
Regional Field Office No. 02
Tuguegarao City, Cagayan

RAMBUTAN
PRODUCTION GUIDE

NOTES

Rambutan

Production Guide

First Edition

NOTES

FOREWORD

The Cagayan Valley or Region 02 is endowed with rich, fertile soil and favorable climate condition suitable for the production of fruits, vegetables and other high value crops.

Cognizant to this, today's Government goal of self-sufficiency and food security prompts all agencies especially the Department of Agriculture to look for strategies that will pave the way of attaining such. And as food agency, it has the responsibility to produce safe, affordable, adequate and accessible food for every Filipino.

One good strategy is the growing of rambutan tree. It is a tropical fruit which has long been cultivated in Southern Luzon (Laguna and Mindanao) and some parts of Northern and Southern Mindanao.

In Region 02, the fruit tree holds a bright economic potential owing to the aforementioned valuable factors which contributed to its year-round cultivation.

Another reason is that the tree is preferred because of numerous advantages such that can be eaten as fresh and in processed form; health benefits of roots, leaves, seeds, and fruit skin, and owing to the limited number of production areas which makes the fruit tree highly demandable.

As such, this production guide was conceived so that valuable and cost-efficient rambutan production technology will be imparted to our farmers, students, researchers, agriculture extension workers, and other agriculture stakeholders which could help them improve their productivity and accelerates the development of high value crops in the Region.

LUCRECIO R. ALVIAR, JR., CESO III
Regional Executive Director

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INTRODUCTION

Rambutan (*Nephelium lappaceum L.)* is a tropical fruit tree, which belongs to the family Sapindaceae. The word rambutan is derived from the Malay word rambut meaning "hair" because of numerous hairy protuberances of the fruit.

It is a medium-sized tropical tree growing to a height of 12 -20 meters. The fruit is round to oval drupe three to six centimeters, rarely eight centimeters tall and three to four centimeters broad, borne together in a loose pendant clusters of 10-20. The leathery skin is reddish (rarely orange or yellow), and covered with fleshy pliable spines. When these fruits are peeled open, a juicy white flesh with a delightful sweet taste, which clings to a woody seed will be revealed.

DEPARTMENT OF AGRICULTURE (DA)

The DA is the principal agency of the Philippine Government responsible for the promotion of agricultural development growth. In pursuit of this, it provides the policy framework, helps direct public investments; and in partnership with Local government units (LGUs) provides the support services necessary to make agriculture and agri-based enterprises profitable and to help spread the benefits of development to the poor, particularly those in rural areas.

The DA's primary mission is to increase the real incomes of farmers and fisherfolk, thereby contributing to the achievement of the national goals of alleviating poverty, generating productive opportunities, fostering social justice and equity, and promoting sustainable economic growth:

- To help ensure food security and support the national effort toward self -sufficiency in rice and corn;
- To help attain a favorable balance of trade by enhancing the competitiveness of the agricultural and fishery sectors in both domestic and foreign markets;
- To support the development of farmer and fisherfolk organizations; and
- To promote the development of labor-intensive and employment-generating agro-industrial enterprises.

In the pursuit of its mission and objectives, the Department adopts the following principles:

- Private sector enterprise shall be encouraged to promote the efficient allocation and effective utilization of resources, consistent with objectives of equity and social justice.
- The maximum participation of the people in the development process shall be encouraged since development proceeds only through the favorable interaction of all sectors.
- Development shall be promoted compatible with the preservation of the ecosystem in areas where agriculture and fisheries activities are carried out, exerting care and judicious use of natural resources in order to attain long-term sustainability.
- Sound agricultural growth shall be pursued as the foundation for industrial development.

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In Northern Luzon, the fruit tree is now gaining its popularity owing to its versatility. The fruits can be eaten as raw and can be cooked and made into jams and jellies. The decoction made out of the root and bark is used to treat fever and tongue diseases, respectively. Likewise, the leaves are used as poultices to relieve headaches. Another advantage of growing rambutan is that the trees bear fruit every year.

NUTRITIONAL INFORMATION

Components	Per 100 Grams Edible Portion
Food Energy	59.0 calories
Moisture	84.7g
Protein	0.7g
Fat	0.1 g
Carbohydrates	13.9g
Fiber	0.3g
Ash	0.3g
Calcium	22.0mg
Phosphorus	30.0 mg
Iron	2.5mg
Niacin	0.1mg
Vitamin C	38.6 ug

Rambutan fruit contains carbohydrates, protein, fat, phosphorus, iron, calcium and vitamin C. The seeds contain fat and polifenol. Skin and stem contains tannin, saponin, flavonida, pectic substances, and iron. The leaves contain tannin and saponin. There are seeds, usually light brown in color are high in some fats and oils, which are valuable to industry, and is used in cooking and in the manufacture of soap.

Rambutan roots, bark, and leaves have various uses in the production of dyes and drugs. Part of this plant can be used as a medicinal fruit and have benefits for health such as:

Reduces body fat

Take some rambutan seeds eaten raw, mashed and mixed with other food and eat.

Make skin softer

Same way above where some rambutan seeds eaten raw, mashed and mixed with other food, and eat.

EXOTIC FRUIT SALAD

Ingredients:

- 10 rambutan fruit
- 2 kiwi fruit
- 1 small ripe pineapple
- 250 grams strawberries
- 1 bunch black grapes
- Orange liqueur

Directions:

Slice the pineapple at two inches from the top and use a sharp knife to remove the flesh. Keep the shell to put the fruit in. Chop the pineapple into bite sized chunks.

Peeled and removed the seeds of the rambutan fruits.

Peeled and slice the kiwi fruit.

Hulled the strawberry fruits.

Put the fruit (not the grapes) into a bowl and pour orange liqueur over them-don't overdo it.

Leave the bowl, covered in the fridge tossing the fruit in the liqueur every so often to make sure it is coated.

Put the fruit in the pineapple shell and serve .

EXOTIC FRUIT SANGRIA

Ingredients:

- 12 rambutans or lychees, peeled, pitted and sliced
- 1 star fruit, thinly sliced
- 1 cup pineapple cubes
- 1/2 cup sugar
- Zest and juice of 1 lime
- 1 cup mango juice
- 1/4 cup rum
- 1 bottle 750 ml (3 cups) dry white wine, chilled
- 1 lime, thinly sliced
- Sparkling water, to taste
- Ice cubes, to taste

Directions:

In a bowl and using a muddler, coarsely crush half the rambutans, star fruit and pineapple with the sugar and lime zest. Add the lime juice, mango juice and rum. Cover and let macerate for at least four hours or overnight in the refrigerator. Strain through a fine mesh sieve into a pitcher. Add the white wine and remaining fruit.

Just before serving, add sparkling water and ice cubes if desired.

Hair Care

Gather some of the rambutan leaves, wash, and mash until smooth. Add little water, and stir into the dough flat until pasty. Then squeeze with filtered piece cloth. Water collected is used to damp scalp. This is done every day to see the results.

Treat dysentery

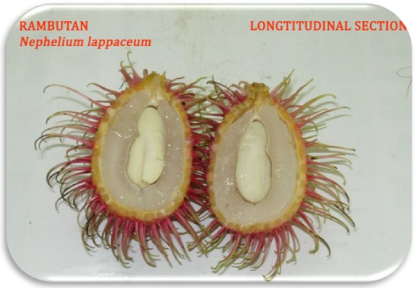
Collect ten skin of rambutan fruits, cut into pieces and wash. Then add three glasses of drinking water, boil until the remaining half of water. Let it be cooled, strain and drink two times a day.

Treat diabetes

Dry fried five rambutan seeds and mash up into powder. Place in a cup and add cold water. Drink one to two times a day.

Cure fever

Rambutan skin that has been dried (15 g) washed. Then add three glasses of water, boiled for 15 minutes. Let it be cooled, strain and drink three times a day, each third section.



INVESTING IN RAMBUTAN

Strengths	Weaknesses	Opportunities	Threats
• Nutritious food with medicinal benefit .	• Short shelf-life of fruits	• Can be grown domestically.	• Occurrence of pest and diseases • Occurrence of typhoons.

FACTORS TO CONSIDER IN CHOOSING LOCATION

A. Soil Characteristics

The rambutan tree thrives best in clay loam or sandy loam soils, which are rich in organic matter and can maintain good moisture content. Clayey and rocky soils are also possible by soil replacement. Dig a hole with 0.5 m in diameter and fill it up with top soil mixed with compost or organic fertilizer, rice hull or some other materials which will make the soil well drained.

B. Climate

Rambutan tree can be adaptable to any type of climate but best where there is shorter dry months.

PRODUCTS/RECIPES

There are numerous products/recipes that can be made or processed out of rambutan fruits. These are jam, jellies, rambutan cocktail, rambutan sweets and canned rambutan. Rambutan sweets are used for pie (as raisin), ice cream and fruit ice. Sometimes arils are canned by stuffing with pineapple in heavy syrup.

PITTED RAMBUTAN IN SYRUP

Ingredients:

2 kg rambutan fruit (the peelable variety)

1-1/4 cups white sugar

Procedure:

1. Select and wash sound ripe rambutan;
2. Peel fruit and slice one side of the pulp to remove seed.
3. Prepare 20°B. syrup by boiling four cups water and 1-1/4 cups white sugar;
4. Remove from fire then soak rambutan for 20 minutes.
5. Pack in a dry sterile preserving jars, remove air bubbles and seal tightly;
6. Sterilize for 20 minutes at 100°C
7. Check for airtightness; and
8. Label and store in a cool dry place.

Yield: 4 jars (8 oz)

PRODUCTS/RECIPES

Rambutan

SELECTION OF VARIETY

Variety Name	Year	Registration Number	Owner Address
JMG –3	1995	NSIC 1995 Rb 01	Jaime Goyena, Sr. Lamot II, Calauan, Laguna
JMG-SW	1995	NSIC 1995 Rb 02	Jaime Goyena, Sr. Lamot II, Calauan, Laguna
ACC-Sp	1996	NSIC 1995 Rb 03	DA-Region No. 8, Tacloban City
Goyena R-13	2002	NSIC 2002 Rb 04	Jaime Goyena, Sr. Lamot II, Calauan, Laguna
Amarillo	2003	NSIC 2003 Rb 05	Ponciano Batugal Calauan, Laguna
Roja	2003	NSIC 2003 Rb 06	Mario Tenorio Calauan, Laguna
Aguilar 1	2003	NSIC 20003 Rb 07	Aklan State College of Agri-culture Banoa, Aklan

An orchard owner can select varieties to be planted from the newly approved varieties by the National Seed Industry Council (NSIC) or from the list indicated herein from year 1995 to 2003.

Successful and vigorous rambutan plantation starts with right variety or varieties. There are numerous varieties grown in the Philippines. However, choose only those which are adaptable in your area. There are also inferior and superior strains wherein the latter one produces sweet, juicy, and thick-fleshed fruits which readily separates from the seeds.

There are also those that have attractive color. Among the superior varieties which are adaptable in Region 02 are the NSIC approved varieties like Rongrein, PSB approved varieties like Maharlika, and National Fruit Crop Technical Working Group approved varieties like the Corales rambutan of Region 02. The latter was qualified as mother tree for scion production.

FIVE-YEAR FINANCIAL ANALYSIS OF RAMBUTAN FRUIT PRODUCTION IN ONE HECTARE LAND

Age of Tree (Year)	Ave.Prod'n Per Tree (kg)	Unit Cost Per kg (P)	Qty. Pro-duced Per ha (Kg)	Total Sale Per Year (P)	Cost of Prod'n Per year (P)	Net Income (P)
1					36,930.00	(36,930.00)
2					29,610.00	(29,610.00)
3	10	50.00	1,000	50,000.00	32,060.00	17,940.00
4	25	50.00	2,500	125,000.00	36,090.00	88,910.00
5	50	60.00	5,000	300,000.00	39,699.00	260,301.00

Basis of Estimate:

1. A one hectare land level in topography which accommodates about 100 plants at a distance of 10m x 10 m;
2. The price of one rambutan grafted plant material is at P100.00/plant material;
3. Skilled laborer is hired at P 200.00/day;
4. Generally, fruiting starts on the third year after the trees are set in the field; and
5. Starting sixth year onward, it is expected to increase 50% production from the fifth year.

Sorting and Packing

Keep the harvested fruits under shade. Sorting the fruits is done according to size and the degree of ripeness. Wash and dry them before packing. Select the fruits which are of good quality and pack in an environment friendly (carton box) packaging material especially designed by the DA-RFO 02. The selected fruits can be packed according to sizes (1 kg, 2 kg and 3 kg).

MARKETING

Part of the rambutan fruits produced by the Stations of the Department of Agriculture Regional Field Office No. 02 will be promoted thru the DA-Agribusiness Marketing Assistance Section (AMAS) - One-Stop Agribusiness Center (OSAC), as well as other institutional establishment within and outside the region. Prospective buyers and other interested agriculture stakeholders are advised to coordinate with DA-AMAS-OSAC Office located at Carig, Government Center, Tuguegarao City for market linkaging.

PROPAGATION

Rambutan tree can be propagated either by seeds or by asexual propagation. Asexually propagated plant materials can be sourced out from DA Research Outreach and Satellite Stations or from any accredited nursery operators in your locality.

Grafted planting material is preferred because it bears fruit earlier and becomes true-to-type. Planting materials propagated thru seeds have 25 percent chance to bear fruit.

LAND PREPARATION

In hilly areas, clean or underbrush the area and remove all stumps, while for flat areas, plow and harrow thoroughly to loosen the soil.

STAKING

Stake at a distance of 8-10 meters between hills and 8-10 meters between rows. Prepare holes measuring 30 cm in diameter at a depth of 30 cm.

PLANTING DISTANCE

The ideal planting distance is 10 x 10 meters because the trees grow bigger using the square method of planting.

HARVEST AND POSTHARVEST PRACTICES

Harvesting

Rambutan fruits are ripe three and a half months or 14 weeks from fruit set. Harvest the fruits as soon as they are fully ripe or when the skin is pinkish red. Usually a bunch of rambutan fruits do not ripe at the same time, thus, requires harvesting by priming.

Harvest it with the use of shears or a long pole with a hook on one end. It is recommended to cut-off about four to five inches of the fruiting twigs.

Daily harvesting during peak season can be achieved in a moderately-sized orchard (200-300 trees).

Insect/Pests/ Diseases	Symptoms	Control Measures
A. Diseases		
1. Powdery Mildew	• Small white powdery spots on the upper surface of the leaves; and • Pathogen can also affects stem and floral parts of the plant.	• Clean culture management practices; and • Application of recommended fungicides.
2. Damping-off	• Water soaked sunken lesion at ground level causing the affected seedlings to become stunted	• For seedling, soil sterilization of planting medium in nurseries; • Clean culture or sanitation; and • Application of appropriate fungicide if needed.
3. Leaf spot	• Oblong or large circular spot on the leaves and stem.	• Use healthy planting materials; • Practice intercropping; • Do clean culture management practices; and • Application of recommended fungicides.

PLANTING

The best time to plant is during the on-set of rainy season. Planting any time of the year or during dry months is also possible, as long as the trees will be provided with adequate moisture and partial shade.

Apply organic fertilizer plus inorganic as basal fertilizer based on soil analysis and cover with thin layer of soil. Water the plants and provide with partial shade.

Carefully remove the plant material from its container and plant it in the hole, cover with top soil and press gently. Be sure that the potted plant should be set at about the same level as it stood in the nursery.

Water the plants and provide with partial shade.

Fertilization. The general recommendation in the absence of soil analysis. Apply a kilogram of organic fertilizer per tree every two months for the first two years. On the third and fourth year, apply one or two kg of complete fertilizer per tree and a mixture of 300 g of muriate of potash.

Weeds. Weeds compete with rambutan tree for soil nutrients, retard growth and increase labor. As such, practice ring weeding one meter radius from the base of the plant quarterly or as the need arises.

Mulching. Rice hulls or grasses from the ringweeded tree can be use. Avoid materials that are alternate host of insects and hazardous to fire.

Irrigation. Irrigate young trees during the dry months. Water is needed during the flowering period up to the fruit development to avoid flower abortion and fruitlet drops.

Intercropping. During its first four years, intercrop the plantation with leguminous and early maturing crops. This practice will provide additional income while the trees are still young. Leguminous crops when plowed under, adds fertility to the soil and prevent weed growth.

Pruning. Remove water sprouts below the graft union. During the first three years, dead and diseased twigs are likewise be pruned.

Insect/Pests/ Diseases	Symptoms	Control Measures
A. Insect Pest		
3.Twig borer	• Wilted twigs are readily visible ; • Small darkened holes on fruit surface and twigs; and • Infected twigs/ fruits contain frasses and decay.	• Practice clean culture/ sanitation by removing infected twigs and fruits and bury; and • Apply appropriate insecticide if needed.
4. Fruit fly	• They are slightly larger than the housefly; and • Dropping of immature fruits.	• Use attractants methyl/eugenol, zorgen and suppernet); and • Practice clean culture by collecting infested fruits and proper disposal through burning or burying them.

INSECT PESTS AND DISEASES AND THEIR CONTROL

Regular monitoring is needed to determine the extent of insect damage and to know the appropriate control measures to be applied.

Insect/Pests/ Diseases	Symptoms	Control Measures
A. Insect Pests		
1. Fruit borer (Cacao Pod Borer)	• Discoloration of infected flowers; • Infected leaves and fruits stuck together by webbing and show signs of surface feeding; • Larva is often found among external webbing on fruits and leaves; and • Infected fruits become watery and contain frass and decay.	• Intercropping; • Using insect attractants (suppernet, methyl/ eugenol or sorgen); • Sanitation by removing infected parts of the plants and dispose properly; and • Chemical pesticide application if needed and should be done judiciously to avoid side affects.
2. Mealy bugs	• Low quality of the fruits; • Sooty molds develop; and • Always accompanied by ants because of the honeydew they secretes.	• Hand picking; • Use of clean planting materials; • Remove infected parts of the tree and burn; and • Observe field sanitation.

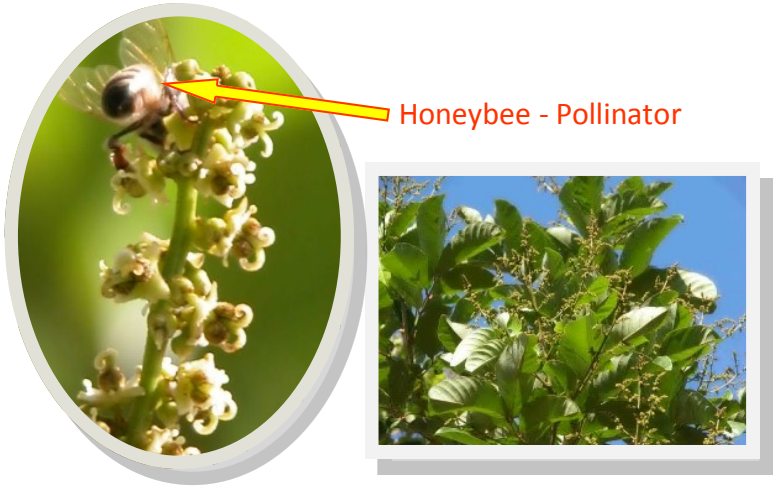
The ideal and best fruiting trees to maintain are those low growing trees (about five meters tall) with spreading branches. To achieve this, prune the lead trunk thru center pruning.

Fertilization. The success of fruiting depends on the availability of water and fertilizer applied during the pre-conditioning of the tree up to the fruit development following the general recommendation.

During the pre-conditioning stage, apply organic fertilizer at the rate of 25 kg/tree just after ring weeding. Apply rice hulls as mulch after the application of organic fertilizer around the tree.

Apply inorganic fertilizer 1-2 months after pre-conditioning of the tree. Dilute 2-3 kilogram of complete (14-14 -14) or ammonium phosphate (16-20-0) mix with 300 g of muriate of potash in a container or plastic drum with mounted hose using fertilization method. The most simple way is to cut sturdy plastic tube about two feet long and position the tube in five strategic locations along the root hair zone, about one meter away from the base of the tree. Dig a hole and place the tube in slanting position. Pour the fertilizer mixture into the tube and the roots will absorb the fertilizers applied. This is done in preparation of the flower budstick.

At flowering stage, irrigate the trees to avoid flower abortion. Likewise, avoid any spraying during full blown so as not to kill the pollinators.



During the fruitlet development, spray foliar fertilizer mix with insecticide and fungicides to prevent occurrence of pests and diseases. Irrigate the tree to avoid fruitlet drops. Apply second dose of muriate of potash diluted in water to enhance fruit enlargement and sweetness of the fruit. Repeat foliar spray ten days after the first foliar spray.

Pruning. Diseased and dead trunks must be pruned. After the fruits are harvested, pruning is necessary to enhance the development of lateral fruiting branches.