

CULTIVATION OF PAPAYA

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Classification & Botany of Crop

- Botanical name - *Carica papaya*
- Family : Caricaceae
- Caricaceae consist of 4 generas and 31 species.
 - Carica -22
- Fruit type- Berry
- Edible part-Mesocarp
- Edible fruits are only found in *Carrica papaya*.
- $2n = 18$

PAPAYA

- Papaya is native to Tropical America.
- Currently grown in India, Hawaii island, Tropical America, Sri Lanka, Philippines, Indonesia, South America as commercial level cultivations.



Nutritive Value (Per 100gm edible portions)

Water	90.8g	Phosphorus	13.0mg
Energy	32.8k cal	Vit A	2020IU
Protein	0.6g	Carotene	666.0 mg
Fat	0.1g	Thiamine	40.0 mg
Carbohydrates	7.2g	Riboflavin	250.0 mg
Calcium	17.0mg	Vit.C	57.0 mg



Present status

- Papaya cultivation spread from 32° N and S from the equator.



- Sri Lanka - 4653 ha under cultivation
- Annual production – 18730 mt.

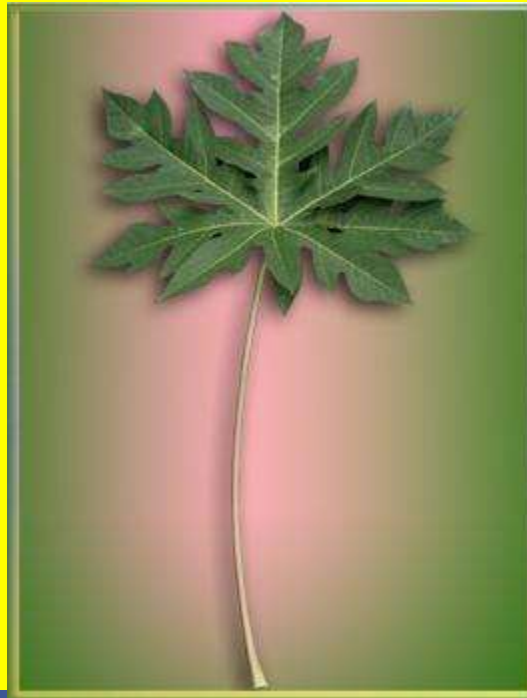
➤ BOTONY –(Dicotylednous plant)



- Stem – 2-10 m height, soft stem having scars along the stem. At top of the stem spirally arranged leaves could be seen

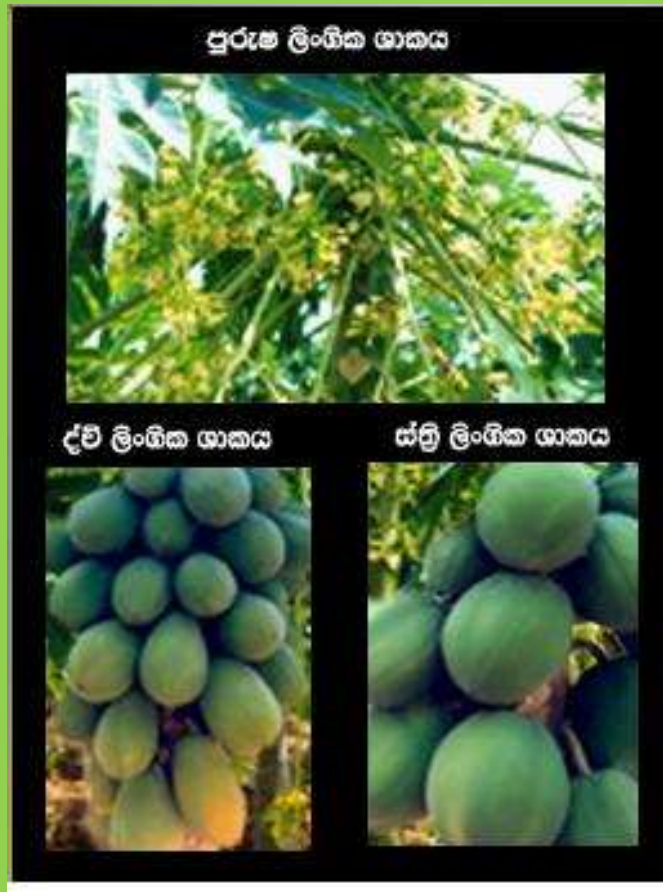
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- Leaves – Long stalked palmate shape deeply lobed.
- Leaves are produced in 2-3 weeks interval. In a mature plant, around 15 number of leaves could be seen.



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➤ Flowers – Male, female and hermaphrodite plants could be seen.



Cont.....

Female flower



Male flowers



Fruit

- Berry type, round shape fruits are produced in female trees and oval shape fruits in hermaphrodite trees.
- Core could be seen inside the fruit and seeds are attach to flesh. It takes about 3 -3.5 month to mature a fruit.
- Papain could be extracted from immature fruits

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Ecological requirements

- Deep well drain organic matter rich soil is preferable for successful papaya cultivation.
- If irrigation facilities are available papaya can be grown even in low fertile soils using organic and inorganic fertilizers.
- Preferable to have a deep water table of 90 -120 cm.

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- Drainage cannel should be established in the filed to remove the excess water. Water logging around the root zone is harmful for plant growth.

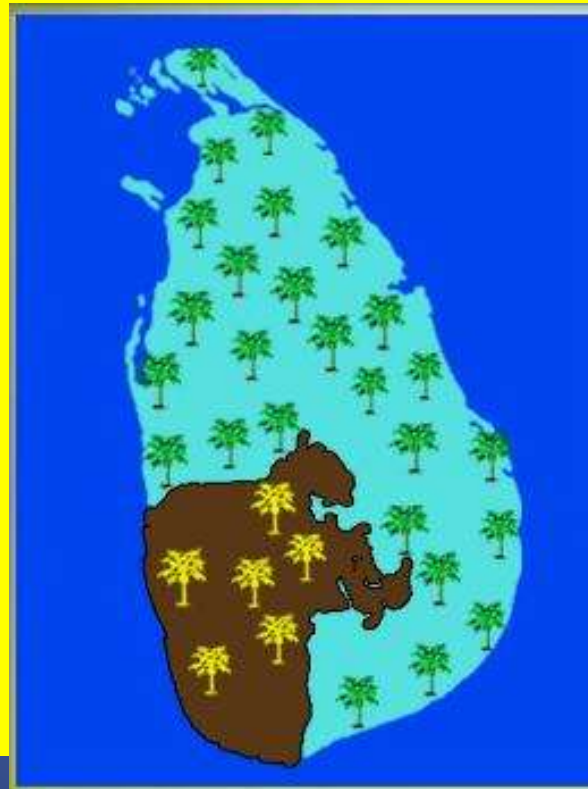


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- Wide range of temperatures could be tolerable.
- Optimum temperature -28°C – 35°C
- Temperature below 10°C affects adversely on growth and development of fruit; thus delayed maturity and ripening.

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- Rain fall - 1000-1500 mm /year, well distributed. Preferable to have 80 % RH.
- Areas with high incidences of viral diseases are indicated using brown color in the given map



Varieties

- Vary difficult to maintain varietal characters due high rates of cross pollination.
- Seed propagation is widely practiced.
- Varieties are categorized in two groups:

1.GYNODIOECIOUS VARIETIES-

pusa delicious -it has sex forms,pistillate & hermaphrodite are found,

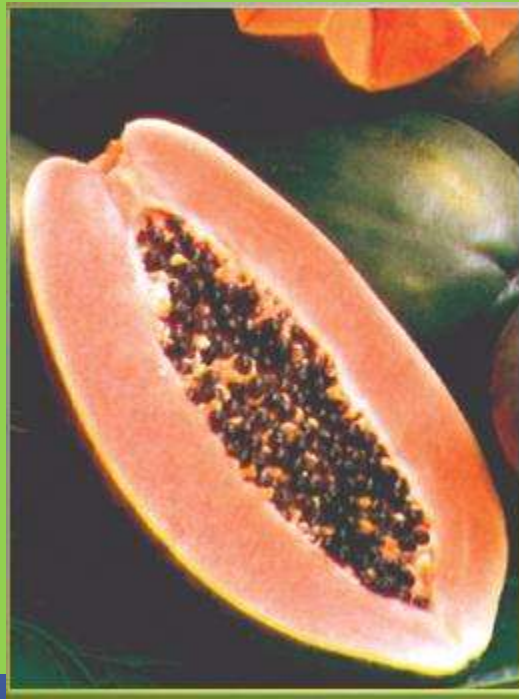
- the fruits are medium in size with deep orange flesh colour having excellent flavour.

- **Pusa majesty**- the fruits are medium in size & round in shape, the flesh is solid in texture & yellowish in colour.
- Plants have also tolerance to viral disease.
- Other varieties **coorg honey dew, taiwan, sunrise solo, surya**
- **DIOECIOUS VARIETIES-**
- **Pusa dwarf** - it has dwarf structure & more precocious in bearing
- The fruit size is medium(1-2kg) & oval in shape , the variety is most suitable for high density orcharding .
- **Pusa giant**-plant bears fruit at 1m height.
- The plant can withstand strong winds & storms.
- Fruits have attractive big size & use in canning industry.

- **Co-5(for papain extraction)**
- **Hathras gold**
- **Pusa nanha(suitable for pot gardening)**
- **Betty**

Rathna

- Recommended in 1977 by DOA. No male plants could be seen. Only female and hermaphrodite plants are there in the ratio of 1:2.



Red lady

- Imported hybrid.



Cultivation practices

Planting materials

- Seed-rate of papaya in case of gyanodioecious-300g/ha
dioecious-400-500g/ha
- Seedling are widely used
- Seeds are extracted from well ripened fruit. Wash the extracted seeds to remove the gelatinous layer on seed coat. Then dry the seed in shady place.



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➤ Plotting mixture

Top soil 1

Sand 1

Compost or decomposed cow dung 1

➤ Fill the above mixture in to poly bag of 10 cm in diameter and 20 cm in height. Put 24 hour soaked 2 – 4 seeds per bag.

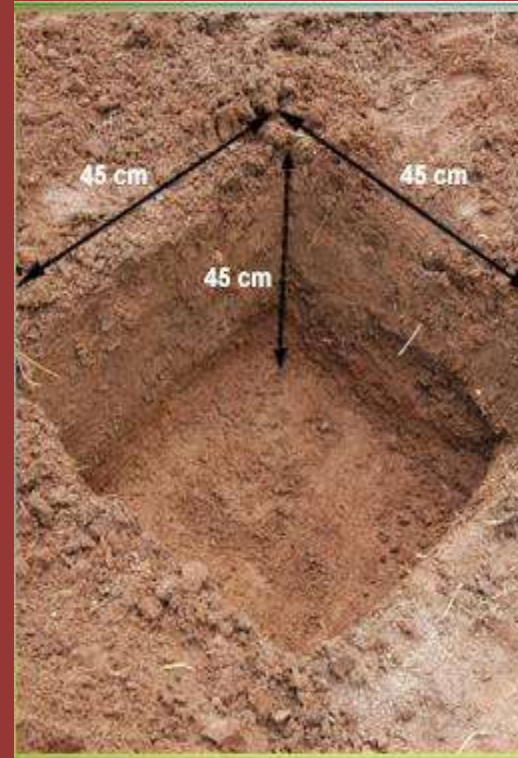
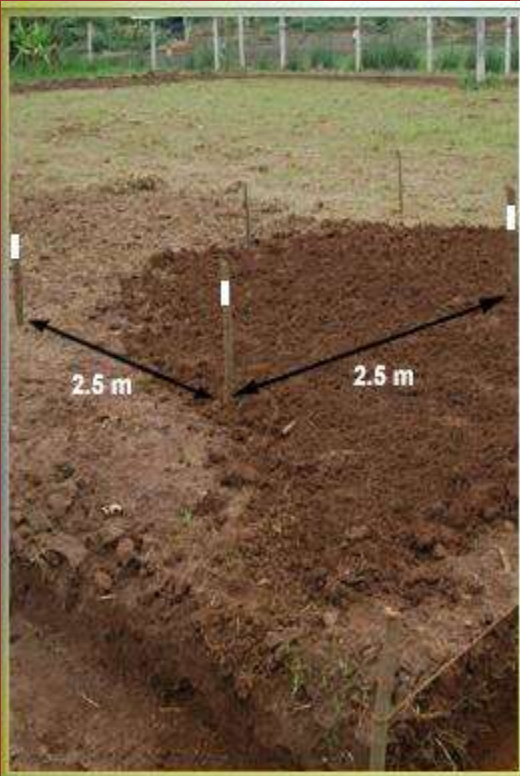
➤ For field planting seedlings are suitable when they are about 20 cm in height.

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Field establishment

- Plough the land well and bring it in to fine tilth.
- Prepare the planting holes (45 x 45 x 45 cm) with spacing of 2x 2.5 m , 2.5 x 2.5 m or 2.5 x 3 m spacing.



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- Add top soil and organic manure to the planting hole and basal dressing should apply two days before planting.
- Plant 3 – 4 seedlings in a single planting hole for open pollinated varieties.



Irrigation

- Apply water just after planting and assure to avoid any water deficit during first month after planting. Apply mulch in 10 – 15 cm circle around the plant base.



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Fertilizer application

	WZ			DZ / IZ		
	2 days before planting	2 month latter	2 days before planting	2 month latter		6 month latter
Urea	55	55	55	60	60	130
Rock phosphate	80	80	80	-		
TSP	-			40	40	40
MOP	95	95	95	125	40	130

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- Hereafter apply fertilizers in three month interval.
- In addition to inorganic fertilizers apply organic manures also.
- When fertilizer is applied sufficient moisture should be there in the field



Weed management

- In mature plantation it is advisable to maintain weed free condition with in 90 cm distance from the plant base. Between papaya rows weed control is practiced by just slashing.



Pest and diseases management

DISEASES:

- Collar rot/foot rot- the soil borne fungus *pythium aphanidermatum* causes rooting of the tree trunk at the point where it leaves the soil due to stagnation of water subsequently the leaves wilt.
- Copper oxy chloride@ 2gm/lit checks the spread of disease.
- **Papaya mosaic**- under the effect of viral disease, leaves become small, curled, crinkled with blister like patches of green tissue.
- The growth of the plant is checked and the tree die after a few months.

- OTHER IMPORTANT DISEASE-
- Papaya leaf curl
- Anthracnose
- **INSECTS:**
- **Red spider**
- **Aphids**
- **White fly**

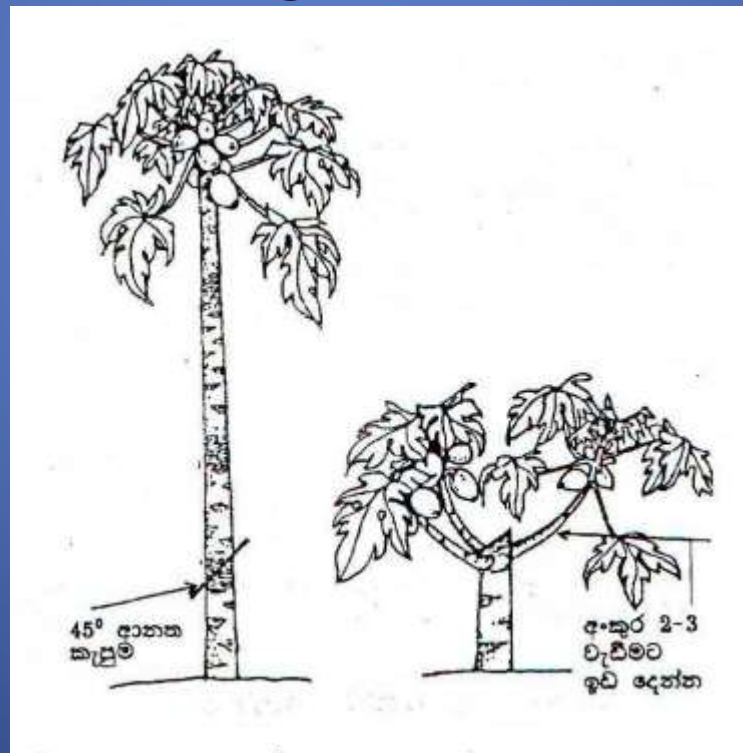
Thinning out of fruits

- Aim is to increase fruit size and avoid deformed fruits. It should practice at early stages of fruit growth.



Ratoon cropping

- When plants are too high which cause difficulties in harvesting of fruits cut the plant at about 60 cm height from the ground at an angle of 45° . Then allow them to grow 2 -3 number of strong branches.



Harvesting

- Papaya trees set fruits within 8 – 10 month of their planting. In another 4 -6 month depending upon the season the fruit develop to proper size.
- 25–30 numbers of fruit can be harvested per plant per year. Economic lifespan of papaya cultivation is about 3 years.
- 10 – 14 months after planting 1st harvest can be obtained. Once the fruit is slightly turns into yellow color it can be harvested.

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Post harvest aspects

➤ Grading of fruits



➤ Packing



Storage

- At ambient temperature fruits can be kept for 5-7 days.
- At 12⁰C fruits can be kept for 20 -25 number of days.

