THE PAPAYA

*Carica papaya*  Family: Caricaceae

Papaya originates from tropical Central and South America, ranging from Mexico to Bolivia. This fruit, however, is now found year-round throughout tropical and equatorial regions.
Introduction to Papaya
USAGES

- Ripe papayas
- Papaya juice and nectar
- Unripe papaya: Green papaya is frequently boiled and served as a vegetable
- Young leaves: are cooked and eaten like spinach in the East Indies
- In India, papaya seeds are sometimes found as an adulterant of whole black pepper
# Nutritional facts

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>23.1-25.8</td>
</tr>
<tr>
<td>Moisture</td>
<td>85.9-92.6 g</td>
</tr>
<tr>
<td>Protein</td>
<td>.081-.34 g</td>
</tr>
<tr>
<td>Fat</td>
<td>.05-.96 g</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>6.17-6.75 g</td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>0.5-1.3 g</td>
</tr>
<tr>
<td>Ash</td>
<td>.31-.66 g</td>
</tr>
<tr>
<td>Calcium</td>
<td>12.9-40.8 mg</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>5.3-22.0 mg</td>
</tr>
<tr>
<td>Iron</td>
<td>0.25-0.78 mg</td>
</tr>
<tr>
<td>Carotene</td>
<td>.0045-.676 mg</td>
</tr>
<tr>
<td>Thiamine</td>
<td>.021-.036 mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>.024-058 mg</td>
</tr>
<tr>
<td>Niacin</td>
<td>.227-555 mg</td>
</tr>
<tr>
<td>Ascorbic Acid</td>
<td>35.5-71.3 mg</td>
</tr>
<tr>
<td>Tryptophan</td>
<td>4-5 mg</td>
</tr>
<tr>
<td>Methionine</td>
<td>1 mg</td>
</tr>
<tr>
<td>Lysine</td>
<td>15-16 mg</td>
</tr>
</tbody>
</table>

Food Value Per 100 g of Edible Portion
Botanical description

Papaya plants range from 3 to 10 m in height.

Hermaphrodite flower

Female Hermaphrodite Male Hermaphrodite
FRUITS

- There are different types of papayas,

Hawaiian  Mexican  Malaysian
### WORLD MAJOR PAPAYA IMPORTER

<table>
<thead>
<tr>
<th>Papaya</th>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import (1,000 t)</td>
<td>2000</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>Nafta</td>
<td>74.8</td>
<td>89.9</td>
<td>94.2</td>
<td>107.9</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>54.3</td>
<td>62.4</td>
<td>64.4</td>
<td>68.5</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>16.7</td>
<td>18.7</td>
<td>26.7</td>
<td>38.8</td>
<td></td>
</tr>
</tbody>
</table>

### MARKET SHARE OF BRAZILIAN PAPAYA

<table>
<thead>
<tr>
<th>Papaya</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import (t)</td>
<td>% Brasil</td>
</tr>
<tr>
<td>Europe</td>
<td>72</td>
</tr>
<tr>
<td>Nafta</td>
<td>6</td>
</tr>
<tr>
<td>Asia</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: FAO
WORLD MAJOR PAPAYA EXPORTER

<table>
<thead>
<tr>
<th>Export (1,000 t)</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>59.8</td>
<td>74.0</td>
<td>68.6</td>
<td>74.8</td>
</tr>
<tr>
<td>Malaysia</td>
<td>44.1</td>
<td>54.0</td>
<td>60.9</td>
<td>68.7</td>
</tr>
<tr>
<td>Brazil</td>
<td>21.5</td>
<td>22.8</td>
<td>28.5</td>
<td>39.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US$/Kg</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>0.82</td>
<td>0.81</td>
<td>0.76</td>
<td>0.74</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.40</td>
<td>0.41</td>
<td>0.40</td>
<td>0.59</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.41</td>
<td>0.46</td>
<td>0.43</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Source: FAO

Brazil: Europe, Canada & USA
Mexico: USA
Malaysia: Singapore & Hong Kong - China
VARIETIES

GOLDEN

TAINUNG 01

MARADOL

SOLO 8

EXOTICA

MORI

CIBINONG

GOLDEN BEAUTY CAIRNS
**Growing Papaya**

*Crop cycle*

- 0 1 1.5 2 3 4 5 6 7 8 9 10 11 12 13 24

**Choice the seeds**

The seed should come from hermaphrodite

1-select the best trees in the plantation (colour, yield, fruit shape—hermaphrodite)

2-cover the flowers with a bag once they form to ensure self-pollination

3-mark these flowers

4-collect them at maturity.
Planting density

Papaya stands can range from 2,000 to 2,500 plants per hectare depending on the cropping technique used. A triangular 2 x 2 planting design can be adopted for non-mechanised cultivation, and 2 x 2 x 4 in double rows for mechanised cultivation.

The following plant spacing can be used:

- 2.0 m x 2 m  ð️ 2500 plants/ha,
- 2.5 m x 1.60m  ð️ 2500 plants/ha,
- 2.5 m x 1.8 m  ð️ 2222 plants/ha,
- 2.7 m x 1.8 in rows  ð️ 2060 plants/ha,
- 2.7 m in rows x 3m  ð️ 1230 plants/ha

[Image of a papaya plant]

[Image of soil with plant spacing]
GRAFTING
Solo Golden – single row

1,80m

3,60m
Tainung 01: single row
Chemical fertilizers is applied almost every day via irrigation system.
Phytosanitary treatments
MAIN PROCEDURES REQUIRED IN THE PRE-HARVEST
The monitoring must be done in the proportion of 1 trap/ha being 50% with Mc Phail (hydrolised protein 5%) and 50% Jackson (Trimedlure) traps. Control (chemical) when the population reach 7 individuals of *Ceratitis capitata* or *Anastrepha fraterculus* / trap / week and and do not export from the area if the population surpass 14.
Monitoring and control of ringspot virus and stick disease in papaya
✓ Remove from the orchard rejected fruits.

✓ Field must be kept in good phytosanitary conditions.
Pests

- Spider mite
  Scientific name: *Tetranychus urticae*

- Broad mite
  Scientific name: *Polyphagotarsonemus latus* (Banks) *Tarsonemus latus* (Banks), *Hemitarsonemus latus* (Ewing) and *Neotarsonemus latus* (Smiley)

- Whitefly
  Scientific name: *Aleurodicus dispersus* and *Bemisa tabaci*

- Mediterranean fruit fly
  Scientific name: *Ceratitis capitata*

- Gall nematodes
  Scientific name: *Meloidogyne* sp. & *Rotylenchulus* spp
DISEASES and VIRUS

✦ Papaya anthracnose
Scientific name: *Colletotrichum gloeosporioides*

✦ Root, collar, trunk and fruit rot
Scientific name: *Phytophthora Palmivora* (E.J. Butler) and *Pythium* (Trow)

✦ Papaya powdery mildew
Scientific name: *Oidium caricae*

✦ Papaya ringspot
Scientific name: *Papaya ringspot* (Jensen)
Pest and Diseases
Keep the orchard with fruit with degree of ripeness 3.
Degree of ripeness at harvest time

- < 15% of yellow skin
- < 25% of yellow skin
- < 50% yellow skin
- 51 – 75% of yellow skin
- 76 – 100% of yellow skin
MAIN PROCEDURES REQUIRED IN THE POSTHARVEST
100% netted to protect from birds and insects
POTENTIAL SOURCE OF CONTAMINATION

Water:

Carrier of Microorganisms: *E. coli, Salmonella, Vibrio, Shigella, Cryptosporidium, Cyclospora, Giardia*.

Quality must be adequate for intended use. If quality cannot be controlled, GAP’s can minimize risks.

Outbreaks: *Salmonella* in Tomato
Tank: 2,000 liters

Chlorine: 2 ppm
HOT WATER DIPPING TREATMENT
HOT WATER DIPPING TREATMENT

- **HOT:**
  - Temperature: Min. 48,5°C Max. 49,0°C
  - Dipping time: 20 minutes
  - Water: 2 ppm chlorine

- **COLD:**
  - Temperature: Min. 12,0°C e Max. 15,0°C
  - Time: 10 minutes
  - Water: 2ppm chlorine
PELLETS FORMATION