FRUIT TREES FOR AGROFORESTRY LANDSCAPES
By Milan Rupert

How to select the proper fruit trees for your area

<table>
<thead>
<tr>
<th>Fruit</th>
<th>All areas</th>
<th>Dry areas (w/irrigation)</th>
<th>Wet areas (good drainage)</th>
<th>Wind/Salt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Avocado</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Mango</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>

- Generally mandarins and oranges will be better quality in dry areas, while limes, pummelo and grapefruit will thrive in wetter areas.
- Avocados require good drainage
- The following mango cultivars will also produce satisfactorily in wet areas: Carabao, Fairchild, Nam Doc Mai, Manzanillo, Rapoza.

Recommended for dry areas only: Haden, Julie, Pirie, Gouveia, Zill Late.

Subjects:
- Selecting for microclimate/agroforestry system
- Planning (spacing, intercropping, groundcovers)
- Installation (windbreaks, irrigation, fencing)
- Planting
- Maintenance (fertilization, pest control, pruning, etc.)
All areas
Dry areas (w/irrigation)
Wet areas (good drainage)
Wind/Salt

Acerola | V | V
Eggfruit | V | V
Dragon fruit | V | V
Coffee | V | V
Lychee | V (cooler) | V
Longan | V |
Rambutan | V |
Mangosteen | V |
Mountain apple | V |
Breadfruit | V |
Cacao | V |

Shade tolerance in agroforestry systems:

**Light shade tolerant**

- Abiu
- Eggfruit
- Loquat
- Lychee
- Longan
- Jaboticaba

**Heavier shade tolerant**

- Tree tomato
- Carambola
- Guava
- Mountain apple
- Dragon fruit
- Cacao
- Coffee
- Vanilla

Planning

Density/spacing depend on…

- Species/cultivar (root stock)
- Microclimate
- Soil, water, and fertilization
- Management system

Average spacing distances

- Mangos: 30'-40'
  - Dwarf cultivars (Julie, Cogshall, Glenn): 20'
- Citrus: Large standard 30'
  - Medium standard 20'
  - Small standard 15'
  - Semi-dwarf root stock 2/3 of standard spacing
  - True dwarf root stock ½ to 1/3 of standard spacing
- Avocados: 30'-40'
  - Dwarf cultivars (Little cado, Holiday): 20'
  - Lichee, Longan, Rambutan: 20'-30'
Intercropping with temporary crops

- Papaya
- Banana
- Pigeon pea or Moringa
- Sesbania grandiflora, S.sesban
- Glicidia septum

Groundcovers

- Perennial peanut (rhizobium)
- Sun hemp
- Wing bean
- St Augustin grass & Zoysia El Toro grass
- Vetiver grass berms

Installation

Windbreaks

- Install well before if possible
- It will reduce wind five times height on leeward side
- Density is not more than 60%, no gaps
- Clumping, edible bamboo (ex: sweet shoot bamboo, old hamaii, Timor black, velvet leaf)
- Moringa, Dwarf coconut palm, Jackfruit, etc.

Irrigation

- Usually necessary during dry spells for first 2-3 yrs
- Drip systems most efficient but costly
- Micro sprinkler “drag lines” are economical
Main problem on Kauai is feral pigs
- Hog wire is most effective but expensive
- Live fencing with Mexican lime, acerola, pomegranate, moringa, Glicidia (seedlings)
- Cheapest and most effective—DOGS

How to plant your trees

Mix amendments with top soil and put in bottom of hole then fill in with subsoil. Let settle for a couple of weeks (water if no rain) before planting tree.

- Be sure that the tree is planted at its original depth.
- If planting bare root trees, remove 2/3 of foliage.

Amendments
- Organic: well rotted compost and or manure, peat moss (acidic)
- Mineral: lime and or phosphorus based on soil analysis only.

Water in thoroughly to eliminate air pockets around roots.
- Mulching around tree (max 4”) without touching the trunk
- 1st fertilizer topdressing or wait until tree established
- Whitewash trunk against sunburn ants and termites
- Stake and erect 3 sided wind protection if necessary
Pruning and training your trees

Remove all rootstock suckers from grafted trees!

- Control height for harvesting, spraying and wind.
- Keep Avocado, Lychee, longan and other large species at 10-15 feet.
- Open canopy for sanitation/pest control, fruit production and quality.
- After harvest and before new flush (“winter”) best time
- Lychee, longan, rambutan, mango: “donut” shape
- Avocado, citrus and others: control height and thin out interior branches (weak, suckers, crossed etc.)

To avoid tearing bark make first cut 12-18 inches away from trunk then hold branch stub while removing.
- Do not cut off flush with trunk. Begin final cut outside bark ridge and end just outside branch collar.
- Wound sealing compounds are no longer recommended.
- Remove (most flowers for the first 3 years to promote strong growth and proper shape.)

Resources
CTAHR extension agents: Richard Edesu and Roy Yamakawa, for soil analysis, pest control and other.
CTAHR Farmer’s Bookshelf series at www.ctahr.hawaii.edu/fb
Fruits For Warm Climates by Julia Morton at www.hort.purdue.edu/newcrop/morton
Milan at Kauai Nursery and Landscaping