GROWING FRUIT AND NUT TREES

What is this Action Sheet about?

This Action Sheet is about the benefits of growing fruit and nut trees. Fruit- and nut-trees are special because, unlike vegetables, they will produce for many years. Fruits and nuts are good sources of vitamins, minerals, fats and oils, and protein, and are perfect snacks for children. The trees are useful for shade, timber and as a support for climbing plants such as yam, pepper and passion fruit. Selecting a variety of trees that produce in different seasons means availability of fruit throughout the year.

Once developed, some fruit-trees do not need much water (e.g. mango, guava) and may be suited for areas with low rainfall. These trees have deep root systems that enable them to use soil moisture at a deeper level than shallow-rooted crops such as cowpea, leafy vegetables and tomato. Depending on the specific climatic conditions, fruits mature during different seasons. In many parts of Africa, papayas and oranges are ready during the dry season, mangoes and guavas during the wet season, while other fruits, such as bananas, may be available all year round.

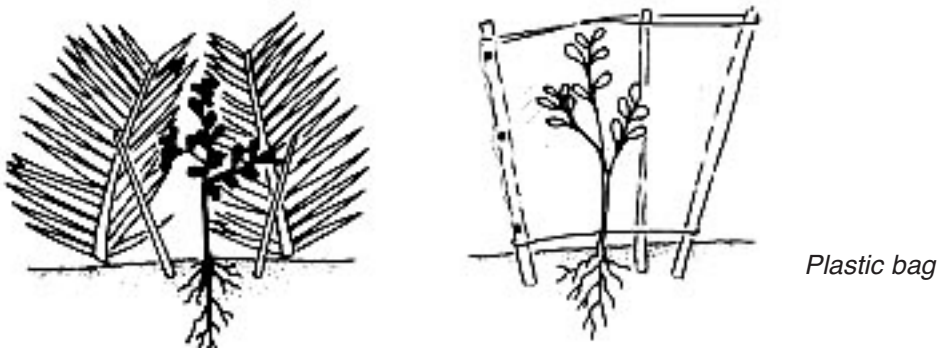
WHERE CAN WE PLANT FRUIT AND NUT TREES?

The selection of a planting location for trees is extremely important because all plants grow best where the conditions suit them. Trees' locations also affect the production conditions of other plants growing in the home garden, particularly those plants intercropped between the trees. Trees usually occupy the middle and upper layers of a garden, and most of them prefer full sunlight. Crops can be planted underneath or between fruit-trees to maximize garden production.

Trees can be grown on a range of soil types because they are able to find nutrients and water deep in the soil. Most fruit-trees do not tolerate wet land (banana is an exception). On wet land, dig out canals and use the soil to make raised beds between the canals. Plant fruit-trees (such as citrus) on the raised beds.

Ideally, fruit-trees should be located away from buildings, to provide enough space for the roots to grow and develop and to avoid damage by the roots to the buildings' foundations. If the home garden is part of the homestead, the trees, particularly those that shed a lot of leaves, should be located away from the house.

FIGURE1



Shelter for young trees

Young trees will grow faster if they are sheltered from strong winds or salty winds from the sea. Too much wind can knock flowers and fruit off trees such as mango and citrus. The tender bark of trees has to be protected from rodents, which can feed on it. Planting other trees, such as tamarind and coconut, as living fences protects fruit-trees and provides shelter for other crops. Use palm or coconut leaves, reeds or grasses to protect tree seedlings.

How do you choose which tree seedling to plant out?

When selecting seedlings or grafted varieties of fruit-trees for a home garden, study the characteristics of the mother tree. When buying trees from a nursery, always choose healthy-looking trees with straight roots. Some other factors to consider are:

Time of harvest season. Is there fruit all year or only once a year? Is this a period when other food is plentiful or in short supply?

Taste, texture and use of fruit. Do the household members like the fruit? Is surplus fruit sold or processed, dried and stored?

Tree shape and size. Will the tree suit the conditions in the garden? Can crops be grown under it, or will its leaves block out too much light? Does the tree variety have strong branches or do they hang down and place the fruit too close to the ground? Will the fruit be easy to harvest?

Disease and pest resistance. Are there any pests or diseases, and how can they be managed?

How do you propagate fruit and nut trees?

Propagating fruit- and nut-trees requires special skills and experience and is best left to farmers who have fruit-tree nurseries. It is important to study the characteristics of each tree variety. Some tree seedlings can be produced in the home garden nursery, but it may be easier to purchase certain types from a commercial nursery. Buying seedlings reduces the risk and delay involved in growing them on one's own. For more information on tree-planting and propagation, see Action Sheet 49: Tree Planting. The best trees to buy are those that have been carefully selected and *grafted*, which means that they are true copies of the mother plant. The local agricultural extension worker can advise home garden managers on the tree seedlings that can be produced in a given home garden.

LAND PREPARATION AND PLANTING

Taking special care when planting seedlings or grafted trees will help the trees establish themselves quickly and safely. As for any other crop, the land has to be prepared carefully before planting. By the time they are transplanted to their permanent location, tree seedlings or planting materials raised in a nursery will already have sizeable root systems. It is important to disturb the bale of roots as little as possible during planting and to ensure that there is ample space in the planting hole to accommodate the plant. Tree roots should never be left exposed to sunlight or left where they will dry out. The size of the planting hole will depend on the type and size of the seedling and the quality of the soil.

Digging the hole

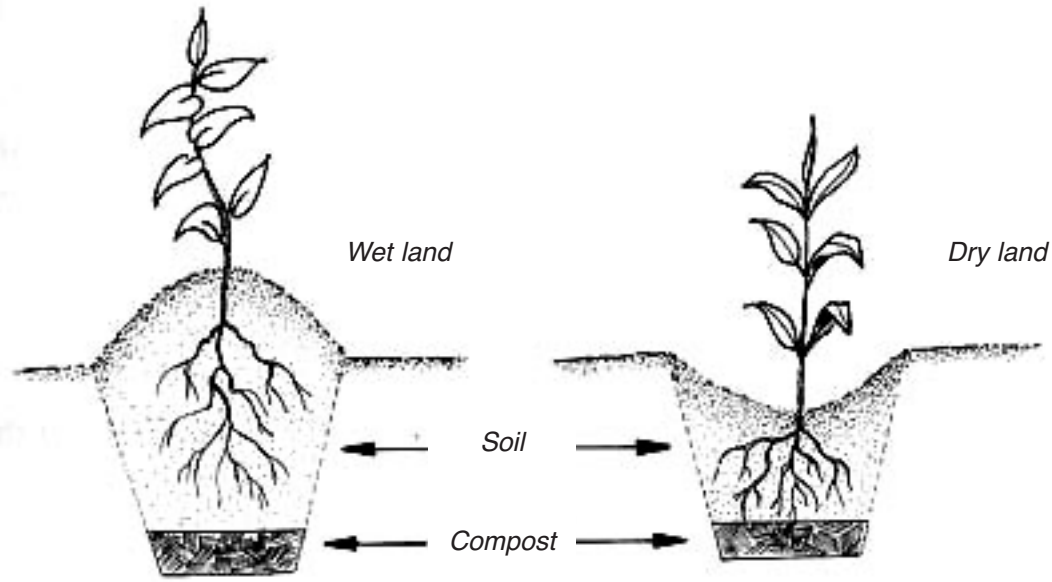
When digging the planting hole, it is important to separate the topsoil from the subsoil. Dig a hole almost twice as deep as the length of the roots of the seedling. The hole should be left open for at least a month before planting to allow air to penetrate the lower soil layers.

Planting

After digging the hole, mix a generous amount of compost or any other manure with the topsoil and a small portion of the subsoil. The mixture should be enough to fill the hole. Pour part of the mixed soil-compost mixture into the planting hole, making the hole about three-quarters full. While someone else holds the tree seedling in the planting hole so that the soil line is well above the root zone, add more of the soil-compost mixture to the hole, and press down firmly around the bale of roots. *If the region is generally wet*, finish off the planting hole in a manner that will keep water away from the stem. *If the region is dry*, make an irrigation basin around the tree (See Action Sheet 45: Rainwater Harvesting for Crops). Water the plant soon after planting. Figure 2 shows what a planting hole should look like in wet and dry conditions.

FIGURE 2

Tree planting in wet and dry lands

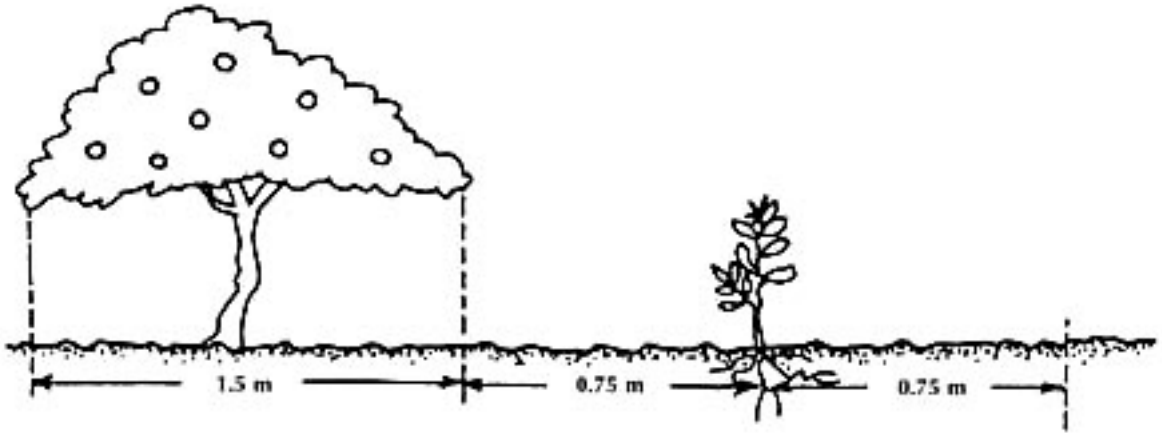


Spacing

Trees should be spaced to avoid competition for water and nutrients and to avoid too much shade. The spacing between trees should allow the trees to develop fully and to create as little competition among plants as possible. For example, as illustrated in Figure 3, a citrus tree's branches spread 1.5 m from one side to the other, so this kind of citrus tree should be planted with at least 1.5 m of spacing. Many fruit-trees develop feeder roots close to the soil's surface, which compete with other crops. So, if crops will be planted underneath them, trees should be planted farther apart.

Correct spacing varies from tree to tree. Plants with a small canopy (e.g. papaya) need about 2 to 4 m of space between them, while those with a big canopy (e.g. certain varieties of mango) need up to 10 m. Before the fruit- or nut-trees reach their full size, other food crops can be planted between them.

FIGURE 3: **Tree spacing**



PEST AND DISEASE CONTROL

Fruit-trees are best prepared to fight pests and diseases when they are planted in conditions that suit them. These conditions include optimum sunlight or shade, shelter, drainage and soil type. Many problems can be avoided if good hygiene is practised: plant only healthy trees, remove and compost fallen or diseased fruit, prune dead branches and do not bring soil from around infected plants into the garden. For more information, read Action Sheet 33: Natural Pest and Disease Control.

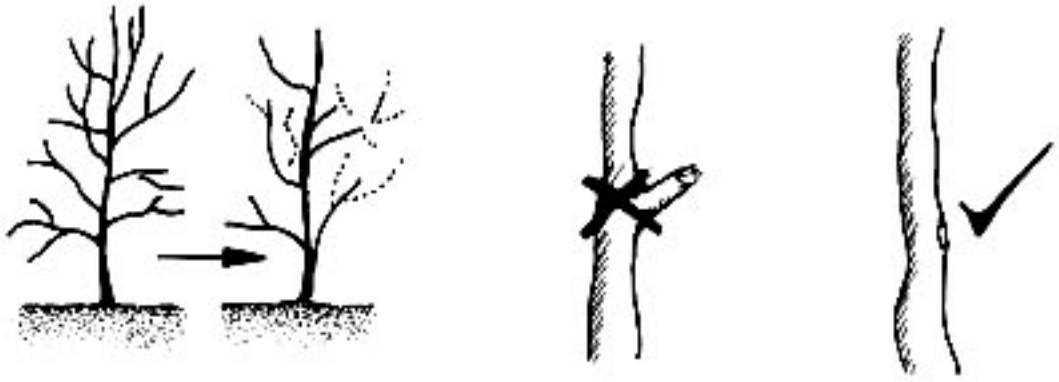
TREE HUSBANDRY

Like other plants and animals, fruit-trees will grow and produce better if they receive proper care.

Pruning

Some trees, such as citrus and mango, benefit from tree shaping. At planting, select the strongest upright branch of the seedling to become the future trunk of the tree. As the tree grows, carefully prune branches that are too close or rubbing together. This allows air and light to circulate through the tree, reduces diseases and can improve fruiting. Prune weak branches and those that let fruit hang too close to the ground where animals or soil diseases can attack them. Remove dead branches, where pests may be living. The cut surfaces can be covered with wood ash to seal the damaged tissues.

FIGURE 4: **Pruning**



Feeding

Trees benefit from the application of compost or fertilizer, particularly at planting. Generally, 2 kg of good compost or a small handful of NPK fertilizer should be applied at planting, and then again every four months. Apply compost or fertilizer before (not during) tree flowering and again when the tree's fruit is half-mature. Put organic matter or mulch under a tree to provide nutrients, reduce weed competition and retain soil moisture.

Watering

Young fruit-trees are sensitive to drought and need daily watering during the dry season for the first year or two. Older trees are more resistant and may not need supplementary watering. Fruit-trees such as papaya benefit from daily watering throughout their lives. Not all trees, however, need supplementary water.

TABLE 1: **Suggested trees: fruits, nuts and spices**

Common name	**Scientific name**
Marula	*Parinari curatellifolia (Indigenous to Africa)*
Mobola plum	*Sclerocarya birrea (Indigenous to Africa)*
Avocado	*Persea americana* Mill.
Banana	*Musa acuminata*
Breadfruit	*Artocarpus altilis* (Parkins.) Fosb.
Cashew nut	*Anacardium occidentale* L.
Citrus (many kinds)	*Citrus* spp.
Cocoa	*Theobroma cacao* L.
Coconut	*Cocos nucifera* L.
Coffee	*Coffea arabica, C. robusta*
Custard apple, sugar apple or soursop (names may differ according to locality)	*Annona senegalensis (Indigenous to Africa)* *Annona reticulata, A. squamosa* L.
Guava	*Psidium guajava* L.
Jackfruit	*Artocarpus heterophyllus* Lam.
Mango	*Mangifera indica* L.
Papaya	*Carica papaya* L.
Passionfruit	*Passiflora edulis* Deg.
Pineapple	*Ananas comosus* Merr.
Plantain	*Musa* spp.
Tamarind	*Tamarindus indica* L.

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http://www.fao.org/docrep/003/x3996e/x3996e38.htm

FOR MORE INFORMATION

CONTACTS

FAO: www.fao.org

Food and Trees for Africa: www.trees.org.za

Practical Action Technical Briefs on Food Processing have lots of ideas about ways to prepare fruit and nuts for preservation or sale: www.practicalaction.org/?id=technical_briefs