

Mango planting manual





**World
Agroforestry
Centre**

This leaflet has been prepared by the Tree Productivity and Diversity theme of the World Agroforestry Centre (ICRAF), Nairobi Kenya with inputs from Erick Ngethe, Valentine Gitonga, Agnes Gachuiri, Sammy Carsan, Katja Kehlenbeck, and Steph McMillin.

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Mango Planting Manual

Trees in general, have many functions in a farming system. Trees contribute directly to food requirements of households, communities and livestock through provision of fruits, vegetables, starch and fodder. Environmentally, trees contribute to a sustainable and increased food production, particularly for vulnerable ecosystems, by improving the soils and microclimates of the surrounding. More importantly to farmers and rural communities, trees are a source of fuel wood, which in many areas is the only available form of energy, in addition to providing locally available materials for construction.

Fruit trees however, have a more direct utility to people for nutrition and food, in that they provide fruits which are rich in vitamins, proteins, essential oils and energy, and thereby play an important role in the nutrition of children, women and men in both rural communities and urban centres. For instance a mango fruit is a rich source of vitamins A, C and B6, which are important nutrients, mainly enhancing good vision and a strong immune system for healthy functioning bodies.

However, it is noted that farmers have limited knowledge on fruit tree cultivation, particularly how to plant fruit trees. Majority of these farmers lack basic skills on fruit tree planting including; proper timing, technical aspects and management techniques. It is important to note establishing healthy and productive fruit trees requires planning and preparation.

Planting a grafted mango seedling

Mango trees (*Mangifera indica L.*) are grown in many African countries. Mangoes contribute to farmer family diets as well as serving as a cash crop. In Kenya, both local and naturalized exotic species are cultivated for their sweet and aromatic fruits, which are eaten fresh or processed into juice, jam, fruit leather, chutneys or dried fruits. In areas of mango production, there is markedly increased demand for high quality mango fruits for both domestic and export markets.

This manual is a guide for farmers, extension agents and tree nursery operators, detailing the process of planting a grafted mango tree and its management on-farm from planting to harvesting of fruits. It is meant to equip them with a step-by-step guide on how to plant and take care for a grafted mango tree.

Things to consider before planting a grafted mango seedling;

1. That there is enough space of land for planting the seedling preferably far from buildings and such other installations as power lines, water pipes or telephone posts,
2. That the soil conditions, fertility and the topography of the area selected fits the mango variety to be planted, and
3. That there is adequate sunlight exposure to the mango seedling planted.



Step 1: **Assemble all required materials**

Assemble all the necessary materials and equipment needed; grafted mango seedling(s) manure and or fertilizer, watering can and water, spade and a hoe (jembe).

Please note it is recommended that quality grafted mango seedling(s) should be sourced from a reputable nursery.





Step 2: Selection of seedlings for planting

It is important to identify and select seedlings that are healthy and big enough for planting as they have a higher chance of survival. Quality planting material (grafted) is important for good production/ high yields. Selected seedlings should not show signs of pests and diseases.



Step 3: Transportation of seedlings for planting

Different means of transporting seedlings are used, depending on the distance from the nursery to the identified planting site. During transportation of seedlings, take caution not to pile them up on each as this can cause damage to the young trees. It is recommended that the seedlings are transported upright in boxes, plastic crates or bags as this will reduce the chance of damaging them.

Water the selected seedling before transporting them from the nursery to the planting site. Watering is done to protect the seedling from drying up during the time of transportation.



Step 4: Land preparation and planting

An ideal climate for mango trees ranges from the humid tropical to the semi-arid sub-tropical, wherever a dry period exists of at least 3 to 4 months and that have sufficient light to induce flowering.

Spacing between mango trees varies from variety to variety and growing environment (dry and wet zone). In dry zone the spacing varies from 10 m x 10 m, because the vegetative growth is limited, while in wet and rich soils the preferred spacing is 12 m x 12 m, because of abundant vegetative growth.

Planting holes should be dug before the onset of a rainy season where possible for water to collect in it to enhance the survival of the seedling planted. The holes should be dug to a depth of 1 meter, width of 1 meter and length of 1 meter (1m x 1m x 1m).

The spacing of these holes should consider the mango tree canopy as well as the soil fertility of the area.





Step 5: Planting the seedling

If ready to plant, re-fill the planting holes with a 1/4 of the top soil from around the hole or with the soils removed when preparing the hole(s).

Where necessary, mix this soil with recommended amounts of farm yard manure or tree fertilizers thoroughly at the ratio of 3:1 respectively.



Remove the polythene bag or polythene tube by tearing on the side or below while holding the seedling up-right.

However, if the seedling was raised in a tin or any other container, bang it from the top slightly.

Then remove the seedling from the tube/ container with its soils by holding it at the base of the stem. Ensure there is no disturbance of root systems while doing this.



Place the seedling in the hole. Half fill the hole with top soil and press it gently towards the root. Fill the hole with water and allow it to drain before completely filling the hole with soils. Ensure this is done without removing the soils around the roots and or bending the roots.



Make a basin around the base of tree by gently pressing down the soils around the seedling. The basin will help hold the water after watering.

Ensure that the seedling sits upright just as it was on the polythene tube in the nursery.

Apply a mulch layer under young trees. Mulch provides organic matter (a valuable source of tree nutrients and food for beneficial soil micro-organisms), reduces moisture loss and competition from weeds.





Management of fruit tree after planting

Irrigation: Watering should be done immediately after planting in the field to foster proper establishment.

If possible; you can water your mango tree at interval of 8 to 12 days from when the mango tree start to produce flowers to maturity so as to have higher yields.

Note; watering is not recommended 2 to 3 months before flowering as it will encourage increased branching and leaves development.

Protection: Where the fruit tree is planted on an open field particularly where animals are also grazed, it is advisable to protect the fruit tree against destruction by livestock, especially goats, by building a fence of sticks/ net around the planted fruit tree.

Manure and Fertilizer application: After about 3-6 months, start application of nitrogenous fertilizers (in case of fruit trees e.g. mango, pawpaw, oranges). Apply nitrogenous fertilizers in varied intervals to avoid leaching out (downward movement of useful mineral or nutrients in water). Alternatively, properly prepared farm yard manure or compost, kitchen ash (left from cooking) and mulching can be used in place of fertilizers.

Pruning and training: The height and form of the fruit tree needs to be controlled. This is meant to guide the tree and facilitate its harvesting at its later stages. It is advisable that you carry out pruning in the first year to guide tree into desired shape, and when trees are about 1 m from the ground, cap seedling to encourage side branches. Carry out pruning later for proper tree maintenance and should be carried out after fruit harvest. Control height to about 3.5 m and all branches at knee level (about 0.5m) be pruned. Remove all dead branches to allow sunlight through canopy to the ground under the tree.

Flowering and fruit formation: Grafted fruit trees usually start to flower within two years from planting. However, fruit formation should be discouraged at this stage as it can affect growth of the fruit tree. For grafted mangoes, it is advisable that fruit formation is allowed from the fourth year onwards.

Pests and diseases: Fruit fly is the most common pests for mangoes and other fruits usually causing a lot of damage to and high losses of these fruits. The use of fruit fly traps is popular method of controlling fruit fly among other ways. Other pests include gall midges and scales insects. Powdery mildew and anthracnose are the most common mango diseases mainly affecting the flowers, tender leaves and leading to development of black lesions on mango fruits. Powdery mildew can be controlled by spraying using Sulphur or Bayleton, while anthracnose can be controlled using copper fungicides.

Maturity and harvesting: It takes between 90 – 160 days after flowering for the mangoes to reach maturity depending on variety. Good harvesting practices are necessary, mangos should not be removed from the tree by beating with a stick and dropping to the ground. They should be picked by hand and if possible best to harvest with some stem (2 – 3 cm) attached to fruit. This reduces the latex which can cover the fruit if incorrectly harvested. Fruits are generally picked when they begin to change outer colour e.g. from deep green to light green in some cultivars. Pick fruit by hand or clip them off with a long stock (part connecting the fruit to the branch) about 2 – 3 cm and pack fruit in a single layer with stalks facing downwards in a box or crate for transportation to the market.

Good postharvest handling should involve storage in boxes/ crates rather than sacks to avoid bruising.





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