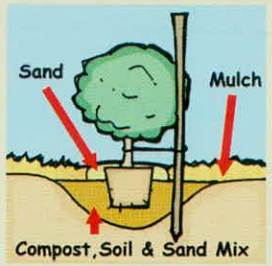
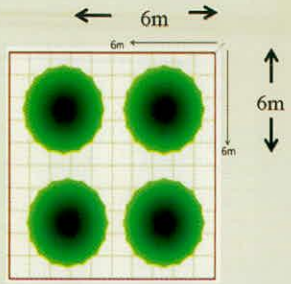
Plant spacing

- Dig holes 60 cm deep x 90 cm wide. Separate top black fertile soil from subsoil-brown less fertile. Mix top soil with manure or one cup of SSP thoroughly .
- Use a spacing of 6 m x 6 m to give a plant density of 110 plants per acre.





- Remove the polythene sleeves and place the seedling in the centre of the dug holes .
- Fill the hole with top soil first and firm the soil around the seedling
- Cover with soil up to the original level of the nursery sleeve but ensure that the graft joint / budded area is kept above the ground to avoid infection to the scion.
- Plant during rainy season. A month after planting remove the grafting tape from the union.

Field Management



Post planting care

- Water the trees regularly for at least six weeks after planting. Maintain a basin– like depression around the plant.
- Shoots that sprout below the graft/bud scion should be removed whenever they appear.
- Citrus trees are shallow rooted, so try not to plough the ground around the tree canopy.
- Once established citrus trees can get by quite well without fertilisers but, of course, they will do better if some is applied. Usually a basinful of decomposed manure each year is good (if available).
- Keep fruit fields weed free. Ring weed around the tree and slash the rest of the orchard.
- At the young stage of the crop , intercrop with lowly growing crops such as beans & groundnuts. Intercrop should be planted away from the basin– like depression around the plant. Keep the plants & intercrops weed free.
- Mulch the trees. Place mulch 1 foot away from the stem.

Training/ Pruning.

Removal dead, dry wood and water sprout. All branches low on the trunk should be removed. Citrus trees don't require regular pruning. Hand pruning opens up the trees to allow more sunlight into the centre. **Allow trees to branch at 3 feet's height**. Ensures even distribution of leaves.

Weed control

- Weeds compete for food and light with young citrus.
- Weed before the weeds flower to prevent production of more seeds.
- Ring weed around the plants to get a weed free area for irrigation and application of manure or other fertilizers.
- Keep the fields weed free to avoid fruit and leaf spots.

In case a herbicide is to be used, technical advice must be sought from extension staff but in any case should not be directed on to the citrus tree. Intercrop at young stage with annual crops e.g. beans. After the crop is fully grown leave it as a mono-crop. Citrus is easily affected by root rot when other intercrops are being cultivated.

Fruit Development

Citrus flower buds begin to form in about 1-2 years. Most flowers don't result in the formation of fruit because more than 99% of them usually fall off b**ecause of high temperature and moisture stress. Ensure adequate water** during and immediately after flowering.

Harvesting

- Citrus stays on the tree from 6-9 months depending on the variety and climate conditions.
- Maturity indicated by color change.
- Harvest citrus fruits by clipping or pulling from the tree.

Yield– Average **7-15 tons/ha/year**. The yield is affected by variety, climate, soils, management and age of the tree. However with good management yield can be **40 ton/ha/year**



Kamathani . I, Musaana. S, Kangire. A , Ddamulira. G , Asiimwe. A, and Otim . A, 2016

Citrus Production Guide



NARO

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Introduction:
Citrus and its close relatives belong to the diverse family Rutaceae. Citrus trees are evergreen shrubs; retaining the majority of their leaves all year-round. The genus *Citrus* comprises several species which represent the important commercial varieties of the genus;

C. *sinensis*	Sweet orange
C. *paradise*	Grapefruit
C. *reticulata*	Mandarin/tangerine
C. *limon*	Lemon
C. *aurantifolia*	Lime
C. *aurantium*	Sour orange



Commercial Varieties: Washington navel, Valencia, Hamlin, Kuno navel Nova, Minneola, Tangelo, Tangerines, Lamati, Meyer (lemon) Tahiti (lime). The longevity of any citrus tree is dependent on a combination of factors:

⇒ **Selection** of a good quality tree on a favourable root stock
⇒ **Correct planting** in a suitable location
⇒ Providing the right amount of **water & fertilizers**
⇒ **Protecting** the trees from diseases, pests and harsh weather changes

Selection: The first step toward successfully growing citrus trees is to take the time to find out which varieties grow best in your area. If possible, buy from a nursery that grows their own trees or at least find out where the trees were grown. This will help ensure that the variety you select will grow well in your area.

Raising citrus root stock.

- To germinate citrus seed , plant them in shallow containers such as nursery flat or a pan with drainage holes in well drained commercial potting soil mix.
- Plant seed 2 or 3 times deeper than their length. Keep seed in warm place (about 21-27 °C) and keep the soil moist.
- Cover the nursery with clear grass or plastic to maintain proper humidity. Germination occurs usually in 12 to 15 days. Replant the seedlings into a larger container of good quality commercial potting mix (Prickling).
- Seedlings will be ready for grafting when they have attained growth of 60 –75 cm tall.

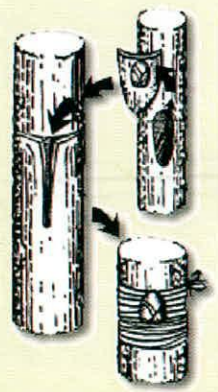


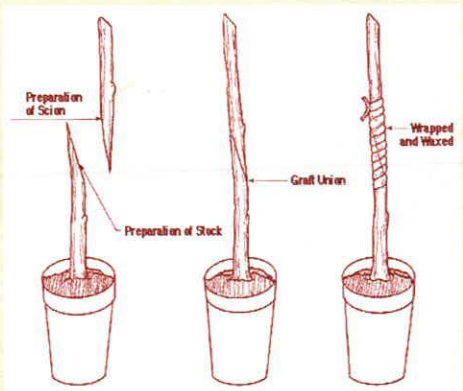
How Citrus Trees are Grown.
In Uganda Oranges are normally raised through grafting or budding on to lemon seedlings. In most citrus trees, the scion, or top section of the graft is a different variety from the roots or rootstock of the tree. Citrus growers plant trees whose tops will grow Washington navel oranges on a rootstock that has special characteristics like

- disease resistance,
- quick to bear fruit or restricting tree size for easier harvesting.

After the rootstock is a year old, a single bud (one that of desirable characteristics : firmness, age etc.) is taken from a branch of the desired scion variety and inserted into the bark of the young seedling. This bud grows into the top of the tree that produces the fruit.(see picture below). For the case of grafting , the commonest and easiest method is the wedge method (See picture below)

Planting : The best time to plant young citrus trees depends on the climate of your area. Planting your citrus tree at the proper depth is the most important factor. Plant the tree too low and the trunk will stay wet encouraging bark diseases. Plant them too high and the root ball will dry out too quickly and thus not provide enough moisture for the seedling.





Field Management Practises

(1) Soil Type
Citrus will grow in most soils from sandy to adobe clay, provided it drains well. Sandy soils must be watered and fertilized more frequently than soils with a higher clay content and growers can add organic matter such as manure or compost to improve water and nutrient holding abilities.

(2) Climatic requirements

- Temperature ranges from 13°C-38°C. Optimum temperature is 25°C-35°C.
- Rainfall required throughout the year . Minimum rainfall of 875 mm/annum, but can grow in areas with annual rainfall from 1000 -1500 mm annually.
- A dry hot day, cool at night climate favors good colour development. Two months period of hot weather is necessary for flower induction.
- **Altitude:** sea level to 1,150 m above sea level

(3) Irrigating

Water quality is very important. Water high in salt content, common in some desert regions, can cause injury to leaves, burning leaf tips and margins. Lower levels of salts can cause the tree to grow poorly or to produce fewer or smaller fruit.

(4) Nutrient requirement

Nutrients that citrus needs in relatively large amounts are nitrogen, phosphorous, potassium, sulphur and calcium. In lesser amounts, citrus requires iron, magnesium, copper, zinc, manganese, molybdenum, boron and chlorine.

Fertilizer	Timing	Application rate
SSP	Before planting	½ kg per hole
Composted Manure	At planting	10-20kg @ plant
NPK	2-3 times	250gm @ plant
MOP	Once a year	750gm @ plant

(5) Soils The sites should be well-drained, fertile soils.