

GUIDE TO THE PRODUCTION OF KOLA (Revised)

Site:

Kola does well in forest soils. Savannah areas of forest outliners are suitable provided there is adequate moisture in the rooting zone and the soil has high organic matter content. Kola roots do not stand flooding, so good drainage is essential.

Varieties:

There are two main varieties grown in Nigeria:

1. The 2 cotyledon type called "Gbanja" (this is *Cola nitida*)
2. The multi-cotyledon type called "Abata" (this is *Cola acuminata*).

Cola nitida is considered the 'true kola of popular trade'. It is in great demand in the northern states of Nigeria and, indeed, all over northern West Africa and central Africa.

Propagation:

Although kola can be propagated by planting seed, budding, marcotting and cutting, the most widely used method in Nigeria is by planting seed.

Pre-Nursery:

Select nuts weighing 12g or more from high yielding generally compatible trees. They should be free from weevils.

Make seed boxes of convenient size with a sowing medium of soil or saw dust 6 inches (15cm) deep and keep moist. Raise the boxes 36 inches – 40 inches (90-100cm) above the ground level. Sow the nuts horizontally on their sides 1 in – 2 inches (3-5cm) deep. Water carefully and cover the box with polythene sheeting or wet sack. Germination takes place months after sowing without treatment. Freshly harvested nuts germinate more slowly than stored nuts. For uniform ger-

mination, nuts should be stored up to 5 months. Sowing scarified nuts reduces germination period to about 20 days after sowing. Scarification also ensured uniform germination.

Nursery:

When the shoots of the germinated nuts reach a height of $\frac{1}{2}$ " – 1" (1.3 – 2.5cm) gently remove them from the boxes and plant them in baskets or whale hide pots in a friable but fairly clay soil. The nuts carrying the young seedlings should be planted horizontally as in the pre-nursery. (Weak seedlings should be discarded). Water the seedlings immediately after potting and keep them under shade. Water daily during dry weather but reduce frequency (or stop altogether) when the rains come depending on the conditions. Reduce shade gradually until the seedlings are ready to be transplanted.

Nursery Beds:

Nursery beds may also be used as an alternative to pots. Nursery beds should be preferably 4ft (120cm) wide raised about 4inches (10cm) above the surrounding ground. Water the beds daily and provide shade which should be reduced gradually as seedlings grow bigger. Seedlings are spaced 12inches x 12 inches (30cm x 30cm) in the nursery bed.

Transplanting:

Holes should be dug well ahead of transplanting. These should be about 2" x 2" x 2" (60cm x 60cm x 60cm) or as appropriate according to the size of the seedlings to be transplanted.

Transplant seedlings early in the wet season when they are about 6" – 10" (15-25cm) high and are about 6 – 8 months old. Seedlings of 9 – 18 months may be kept in large baskets or in the nursery row until they can be transplanted. Such seedlings might probably withstand shock

better than the very young seedlings. At the time of transplanting, the holes should be filled with good top soil drenched with Basudin emulsion or mixed with Basudin granules.

A spacing of 25square feet (7.5m.sq.) spacing may be considered for rooted cuttings.

Shading and Mulching:

Kola plants should be provided with temporary shade of palm fronds if possible in the first two years of planting.

Kola seedlings should be heavily mulched in a ring around the base in a diametre of 1 – 3ft (30cm – 90cm). The mulch should be at least 6” (15cm) thgick. The mulch should be maintained until the kola trees form sufficient canopy.

Fertilizer:

Application of 131Kgn + 21KgP₂O₅ + 139K₂O per hectare is in the interim fertilizer recommendation.

Harvesting:

Kola pods should be harvested regularly and fallen pods removed promptly. This will reduce losses due to insects.

Pests and Diseases:

A. **Pests:** many insect pests have been reported on kola. The four major ones are described:

1. **Kola Stem Borer** – *Phosphorus virescens oliv.* (a beetle) can be big problem particularly in young orchards. The adult borer feeds, lays its eggs on young growths. The larvae then bore into the twigs and towards the thicker woody parts of the plants, retarding their growth and causing die-back.

Control:

No good control methods have been worked out. In cases of less serious infestations, mechanical destruction of the larvae and pupae may be undertaken by poking the tunnel made by the insects with long wires. The adults may be collected and squashed.

Seriously affected trees should be cut down and allowed to regenerate and the cut out plant parts burned. The young regrowth may be protected chemically from re-infestation by spraying with 3oz of Sevin 50W in 6 gallons of water per acre.

2. **Pod Borer** – *Characoma strictigrapta* Hmps. (a moth) attacks young developing kola pods causing them to drop. The insect may be controlled by a suitable insecticide such as Gammalin 20, (0.25%) applied as a fortnightly aqueous spray to the tree canopy during the fruiting season.
3. **Kola Fruit Fly** – *Certitis colac silv.* Bores into and oviposits in mature, soft pods and the larvae develop within the pods. The exit holes of the mature larvae furnish entry points for the highly destructive kola weevils.

Control:

Prompt harvesting before the pods become overripe and the pod walls decay. Aldrex T protects planted seed nuts if dusted with it but it is not to be used on nuts for eating.

4. **Kola Weevils:** There are two important kola weevils:

Balanogastriis kolae Desbr. and *Sophrohinus insperatus*. These have been known to cause serious losses of kola nuts. They are important pests prior to harvest and in storage.

Control lies in good crop sanitation. The weevils are unable to penetrate kola pods to reach the nuts except through exit holes left by the fruit fly (*Ceratitidis colae*) or when overripe pods fall from the trees and become broken. Therefore, pods should be harvested regularly and all fallen pods picked up promptly.

Nuts for storage should be inspected and all infested nuts removed before they are stored. This exercise should be done regularly for nuts in storage.

B. Disease:

Only the important diseases are mentioned here:

- i. **Fruit Disease:** Nut spotting is caused by *Botryodiplodia theobromae* pat. The fungus infests the follicle (kola fruits) which develop a black rot that spreads subsequently to the nuts. Affected nuts first show rusty brown spots which later turn black and become hard and dry.

Control:

Where this disease has been found in the field affected pods should be treated promptly with a suitable fungicide such as Bordeaux mixture, to prevent spread of the disease.

- ii. **Nut Diseases:** Nut diseases are caused by many fungi comprising species of *Fusarium*, *Diplodia*, *Gliocadium*, *Penicilium pleurotus* and *Schizophyllum*.

Control:

Soak fresh unskinned nuts in water for about 24 hours

to make the removal of testa very easy and then to minimise scars (wounds) on fresh nuts. Rinse fresh skinned nuts with water containing few drops of 1% Milton solution for about 2 minutes before curing. Store in a cool, dry place for storage to protect the nuts from fungal infections. Do not treat nuts with fungicides to avoid consumer hazard.

Soak fresh unskinned nuts for several hours to make testa removal very easy.

To minimise bruise on nuts, avoid the use of teeth, knives or hard objects for removing the testa of a fresh nut. Kola nuts are stored in baskets lined with fresh banana leaves. If this is done soon after harvest, when the nuts are transpiring at a very high rate, the atmosphere around the nuts becomes very hard and promotes the growth of fungi. In a good curing procedure, the nuts should be 'sweated', during which period they lose most of their moisture before they are stored. This eliminates or minimises the growth of fungi.

iii. **Root Diseases:**

Perhaps the most serious fungus problem of kola is root disease which may strike at any time, causing the death of established trees. Kola root disease organisms identified are species of *Fomes* and *Ganoderma*. Control may be achieved by cutting off affected roots and burning them. Choice of a well drained site is probably more important.

Kola Curing and Storage:

Kola nuts are extracted from the pods and soaked in water or buried in moist sand or made into lightly watered heaps for 24 hours to make skinning easy.

Wash the skinned nuts and place in unlined baskets, cover lightly with banana leaves and leave for about 5 days to 'sweat' – a process which reduces the water content of the nuts. Place the nuts in leaf-lined baskets and cover lightly with leaves. Stir the nuts periodically to avoid over-heating and to produce uniform curing. During stirring, defective nuts (weeviled nuts, mouldy nuts etc.) should be discarded. Curing takes about 3 weeks and the nuts, when stored, will keep for months without spoilage provided the place is cool. The leaves used to line the baskets should be changed occasionally. Exported kola nuts are usually sun-dried.