

COCONUT RESEARCH BOARD



Leaflet No. 15

THE CEYLON COPRA KILN

The Ceylon Kiln is a simple structure, consisting essentially of a fire pit, a copra grill or platform, a corrugated iron roof, fitted with jack roof and a covered working verandah. There can be minor variations in design and size to suit different conditions and individual requirements. It is also possible to effect economies, by using locally available materials such as unfired mud bricks, round timber, coconut trunks, wooden slats, cadjan roof, etc.

The kiln here illustrated has a total capacity of 10,000 nuts allowing a daily intake of 2,500 nuts. Smaller kilns to suit individual needs can be built on the same principle.

SPECIFICATION

Excavation: A fire pit measuring 30 feet x 12 feet x 2 feet (9.14 m x 3.66 m x 60.96 cm) deep should be marked out and excavated. If the bottom is loose and sandy, about 7 cubes of gravel should be spread evenly and then well rammed to provide a firm foundation for the walls which should be built up to a height of 2 feet, (60.96 cm) level.

Walls: For the first 2 feet (60.96 cm) the walls are 14 inches (35.56 cm.) thick. Thereafter the thickness is reduced to 9 inches (22.86 cm.) up to the copra platform and above this it is further reduced to 4½ inches, (11.43 cm) so providing the ledge to support the platform.

The two gable-end walls are built up to a height of 7½ feet (2.29 m) and the back wall to a height of 7 feet (2.13 m) above ground level, but the front wall does not reach above ground level.

The walls are strengthened by 14-inches (35.56 cm) pillars, which also support the roof. The fire pit is divided into six compartments by five 6-inch (15.24 cm) walls, similarly supported by pillars.

Ventilation : Holes are provided in the two gable walls and the back wall and the front of each section of fire pit is open. The ventilation holes are 6 inches x 12 inches (15.24 cm x 30.48 cm) and are set 2 feet (60.96 cm) apart, one foot above ground level.

Ample ventilation is provided above the copra platform. Humid air can escape *via* the jack roof, under the caves and from the gable ends.

Verandah : The four pillars supporting the roof are 9 inches x 9 inches (22.86 cm x 22.86 cm). The verandah should be paved with bricks, cemented in position so as to provide a firm floor.

Roof : The timber for the main uprights should be well-seasoned jak and for the beams well-seasoned coconut rafters. The rafters should be laid 2 feet (60.96 cm) apart and the reepers 3 feet (91.44 cm) apart.

A corrugated iron roof is generally to be preferred to a cadjan roof, because it does not require frequent renewal, but a cadjan roof allows free ventilation, keeps the kiln warmer at night and so prevents sooty drops of condensed water falling down on the copra.

The Platform : Well-matured arecanut trees should be selected for making the platform. They should be split into slats about 1½ inches (3.8 cm) broad, placed length-wise across the dividing walls with their ends resting in the 2-inch (5.08 cm) ledges of the side walls. Slightly broader slats should be placed across those longitudinal slats and secured together with galvanised wire in order to keep the platform firmly in position.

A Halmilla log or a strong flat plank one-foot broad, should be laid along the outer edge of the platform to prevent the copra from falling off.

Drains : To lead away the rain water falling from the roof a drain must be provided.

Barbecue : This is a sloping platform made of bricks with a paving of cement used for sun-drying the split nuts before kiln drying. A suitable area would be 30 feet by 30 feet (9.14 m x 9.14m).

MATERIAL OF CONSTRUCTION

Bricks	12,000	...	Gravel	11 cubes
Cement	20 bags	...	Clay	15 cart loads
Sand	2 cubes	...	Lime	50 bags

Timber —

Wall plates and ridge plates	33'x3"x5"	(10.05 mx76.2 cm x 12.70 cm)	4 pieces
Ridge plates for jack roof	33'x2"x3"	(10.05 mx5.08 cm x7.62 cm)	3 pieces
Cross beams	14'x4"x5"	(4.27mx10.16 cm x12.70 cm)	4 pieces
King posts	3'x3"x3"	(91.44 cm x 7.62 cm x 7.62 cm)	4 pieces
King posts for jack roof	1½'x3"x2"	(45.72 cm x 7.62 cm x 5.8 cm)	4 pieces
Coconut rafters	8' long	(2.44 m)	16 pieces
Coconut rafters	14' long	(4.27 m)	16 pieces
Reepers	2'x1"	60.96 cm x 2.54 cm)	455 feet (140 m)

Zinc sheets

24 w.g.cwt. 8' long	(2.44 m)	16 pieces
24 w.g.cwt. 9' long	(2.74 m)	16 pieces
24 w.g.cwt. 7' long	(2.13 m)	16 pieces
Galvanised ridging	...	33 feet (10.05m)
Clips	...	200

Platform —

1 Halmilla log or 1 heavy plank, 1 foot (30.48 cm) broad	30 feet (9.14 m) long
Areca nut trees for slats	10 trees
Galvanised wire, 1/16 inch (1.59 mm) gauge	10 lb. (4.54 kg.)

OPERATIONS

The halves of the split nuts are laid carefully face upwards on the barbecue for one day's sun-drying. In the late afternoon, they are collected and put on the platform of the kiln. The depth of the copra must not exceed 12 inches (30.48 cm) or the copra will not be good quality. After this the operator arranges the shells in the fire pit in parallel double rows, each shell being fitted into the cavity of the next. The curing process takes about five days. i.e., about eight to nine firings.

Working Programme: The method of curing on each day is as follows:—

1st Day —

Early morning	Split the nuts.
7-00 a.m. to 4-30 p.m.	Sun-drying if possible.
5-00 p.m. to 10-30 p.m.	1st firing, 2 double rows of shells.
10-30 p.m.	Allow to cool.

2nd Day —

2-00 a.m. to 7-00 a.m.	2nd firing, 1 double row of shells.
4-00 p.m.	Turn the copra.
5-00 p.m. to 10-00 p.m.	3rd firing, 1 double row of shells.
10-00 p.m.	Allow to cool.

3rd Day --

2-00 a.m. to 7-a.m.	4th firing, 1 double row of shells.
4-00 p.m.	Remove shells.
5-00 p.m. to 10-00 p.m.	5th firing, 1 double row of shells.
10-00 p.m.	Allow to cool.

4th Day —

2-00 a.m. to 7-00 a.m.	6th firing, 1 double row of shells.
4-00 p.m.	Turn the copra if necessary.
5-00 p.m. to 10-00 p.m.	7th firing, 1 double row of shells.
10-00 p.m.	Allow to cool.

5th Day —

2-00 a.m. to 7-00 a.m.	8th firing, a short double row according to requirements.
5-00 p.m.	Remove the copra and return all undried for further drying.

Copra Grading: After the copra has been cured it is sorted into following grades:—

No. 1 copra. No. 2 copra. No. 3 copra.

This sorting must be done very carefully otherwise serious penalties may be imposed by the buyers.

Grades :

No. 1 Copra: The pieces are hard, smooth, crisp and uniformly greyish white: they break cleanly and with a snap exposing a sharp straight edge with a uniform pearly lustre, indicating uniform drying to below six per cent.

No. 2 copra: (1) Distorted copra from under-ripe nuts.
(2) Thin and broken copra from over-ripe nuts.
(3) Scorched, burnt or off-coloured copra.

No. 3 copra: (1) All copra of *kalati* stage, i.e., rubbery or immature copra.

(2) All kernels of decayed nuts.