



# CINNAMON PROCESSING

## Introduction

Cinnamon is a valuable spice that is obtained from the bark of an evergreen tree (*Cinnamomum zeylanicum*) that belongs to the Laurel family. Cinnamon is native to Sri Lanka, Myanmar (Burma) and the southern coastal strip of India. The crop now grows in South America and the West Indies, the Seychelles and Reunion. The best quality cinnamon is produced in Sri Lanka.



Figure 1: Cinnamon from Sri Lanka. Photo credit: Practical Action / Neil Noble

Cassia, which is the bark of the evergreen tree *Cinnamomum cassia*, is a similar spice to cinnamon but of an inferior quality. It is a native of Myanmar (Burma). Most of the world's cassia comes from China, Indochina, Indonesia, the East and West Indies and Central America. Cassia bark is coarser and less fragrant than cinnamon and is sometimes used as a substitute.

Cinnamon gets its distinctive smell and aroma from a volatile oil that is in the bark. The oil can be distilled from off-grade bark, leaves and roots.

Cinnamon must be dried before it is stored and sold for market. This brief outlines the important steps that should be taken pre-harvest and post-harvest to ensure that the dried cinnamon is of top quality for the market.

## Cinnamon production

The cinnamon tree is a bushy evergreen tree that is cultivated as low bushes (about 2-3m tall) to make harvesting easier. The bushes grow well in shaded places with an average rainfall and without extremes of temperature. The optimum temperature for production is between 27 and 30°C. The soil should not be waterlogged as this produces a bitter-tasting bark. Eight or ten side branches grow on the bush and these are harvested after about three years to obtain the cinnamon bark.

## Harvesting

Cinnamon bark is harvested twice a year immediately after each of the rainy seasons when the humidity makes the bark peel more easily. The trees are first harvested when they are three years old, one year after pruning. The side stems that are about three years old are removed and the bark is stripped off. Cinnamon bark is only obtained from stems that are between 1.2 and 5cm in diameter.

## Processing

Processing accounts for about 60% of the cost of production of cinnamon. This is because the peeling of bark from the stems is labour intensive and is usually done by hand, by skilled peelers. The quality of cinnamon depends on how well the bark is removed from the stems. The larger pieces or quills can be sold for more than the smaller broken pieces. The Agricultural Engineering University of Ruhuna in Sri Lanka has developed a small mechanised machine for removing the bark from cinnamon stems.

Drying is also an important stage of the processing of cinnamon. It contributes to the quality of the final product.

## Cardamom processing

## Practical Action

- Remove the tender stems (with diameters less than 1.2cm) and use these for mulching.
- Stems with diameters of more than 5cm are not used to prepare cinnamon bark. Remove these and use for oil distillation.
- Remove the soft outer bark using a fine rounded rasp knife.
- Rub the stripped stem with a brass rod to loosen the inner bark. It is important to use a brass rod so that the bark does not become discoloured.
- Make cuts around the stem at 30cm intervals using a small pointed knife. The knife blade should be stainless steel or brass to prevent staining the bark.
- Make long cuts along the length of the stem, so that the bark can be carefully eased off the stem. Use the pointed knife and the rubbing rod to help ease off the bark.
- The pieces of removed bark are known as quills. Place these curled quills inside one another to make long compound quills (up to 1m long). Use the best whole quills on the outside and fill in the centre with broken pieces of bark.

## Drying

The compound quills are placed on coir rope racks and dried in the shade to prevent warping. After four or five days of drying, the quills are rolled on a board to tighten the filling and then placed in subdued sunlight for further drying.

In humid climates or during the rainy season it will be necessary to use a mechanical dryer to complete the drying process. There are a range of dryers available to suit different situations (electrical, gas fired, biomass fuelled). See the Practical Action Technical Brief on drying for further information.

## Grading

The quality of cinnamon is judged by the thickness of the bark, the appearance (broken or entire quills) and the aroma and flavour. The Sri Lankan grading system divides the cinnamon quills into four main groups according to diameter:

Classification	Description	Measurements
1. Quills	Alba	Less than 6mm diameter
	Continental	Less than 16mm diameter
	Mexican	Less than 19mm diameter
	Hamburg	Less than 32mm diameter
2. Quillings	Pieces of bark less than 106mm long	
3. Featherings	Inner bark of twigs and twisted shoots	
4. Chips	Trimmings of quills, outer and inner bark that cant be separated	
5. Powder		
6. Leaf oil		
7. Bark oil	Cinnamaldehyde 30-70%	

## Grinding

Grinding can be a method of adding value to a product. However, it is not advisable to grind spices. After grinding, spices are more vulnerable to spoilage. The flavour and aroma compounds are not stable and will quickly disappear from ground products. The storage life of ground spices is much less than for the whole spices. It is very difficult for the consumer to judge the quality of a ground spice. It is also very easy for unscrupulous processors to contaminate the ground spice by adding other material. Therefore most consumers, from wholesalers to individual customers, prefer to buy whole spices.

Cinnamon is sometimes ground to a powder prior to sale. The ground powder should be packaged in moisture proof packaging (polypropylene bags) to retain the flavour.

## Packaging

Cinnamon quills are cut into pieces up to 10cm in length and packed into moisture-proof polypropylene bags for sale. The bags should be sealed to prevent moisture entering. Sealing machines can be used to seal the bags. Attractive labels should be applied to the products. The label needs to contain all relevant product and legal information – the name of the product, brand name (if appropriate), details of the manufacturer (name and address), date of manufacture, expiry date, weight of the contents, added ingredients (if relevant) plus any other information that the country of origin and of import may require (a barcode, producer code and packer code are all extra information that is required in some countries to help trace the product back to its origin). See the Practical Action Technical Brief on labelling for further information on labelling requirements.

## Storage

Dried cinnamon quills must be stored in moisture-proof containers away from direct sunlight. The stored cinnamon quills should be inspected regularly for signs of spoilage or moisture. If they have absorbed moisture, they should be re-dried to a moisture content of 10%.

The storage room should be clean, dry, cool and free from pests. Mosquito netting should be fitted on the windows to prevent pests and insects from entering the room. Strong smelling foods, detergents and paints should not be stored in the same room as they will spoil the delicate aroma and flavour of the cinnamon.

## Equipment suppliers

This is a selective list of suppliers of equipment and does not imply endorsement by Practical Action.

This website includes lists of companies in India who supply food processing equipment.

[http://www.niir.org/directory/tag/z,,1b\\_0\\_32/fruit+processing/index.html](http://www.niir.org/directory/tag/z,,1b_0_32/fruit+processing/index.html)

## Dryers

### Acufil Machines

S. F. No. 120/2, Kalapatty Post Office  
Coimbatore - 641 035  
Tamil Nadu  
India

Tel: +91 422 2666108/2669909

Fax: +91 422 2666255

Email: [acufilmachines@yahoo.co.in](mailto:acufilmachines@yahoo.co.in)

[acufilmachines@hotmail.com](mailto:acufilmachines@hotmail.com)

<http://www.indiamart.com/acufilmachines/#products>

### Bombay Engineering Works

1 Navyug Industrial Estate  
185 Tokersey Jivraj Road  
Opposite Swan Mill, Sewree (W)  
Mumbai 400015  
India

Tel: +91 22 24137094/24135959

Fax: +91 22 24135828

[bomeng@vsnl.com](mailto:bomeng@vsnl.com)

<http://www.bombayengg.com/contact.html>

### Bry-Air (Asia) Pvt Ltd

21C Sector 18  
Gurgaon – 122015  
India

Tel: +91 124 4091111

Fax: +91 124 4091100

[enquire@pahwa.com](mailto:enquire@pahwa.com)

<http://www.bryair.com/index.htm>

### Premium Engineers Pvt Ltd

Plot No 2009, Phase IV, GIDC  
Vatva, Ahmedabad 382445  
India

Tel: +91 79 25830836

Fax: +91 79 25830965

### Rank and Company

A-p6/3, Wazirpur Industrial Estate  
Delhi – 110 052  
India

Tel: +91 11 7456101/ 27456102

Fax: +91 11 7234126/7433905

[Rank@poboxes.com](mailto:Rank@poboxes.com)

### Industrias Technologicas Dinamicas SA

Av. Los Platinos 228  
URB industrial Infantas  
Los Olivios  
Lima  
Peru

Tel: +51 14 528 9731

Fax: +51 14 528 1579

Cardamom processing  
**Ashoka Industries**  
Kirama  
Walgammulla  
Sri Lanka  
+94 71 764725

**Kundasala Engineers**  
Digana Road  
Kundasala  
Kandy  
Sri Lanka  
Tel: +94 8 420482

## Packaging and labelling machines

**Acufil Machines**  
India (See above)

**Gardners Corporation**  
158 Golf Links  
New Delhi 110003  
India  
Tel: +91 11 3344287/3363640  
Fax: +91 11 3717179

**Gurdeep Packaging Machines**  
Harichand Mill compound  
LBS Marg, Vikhroli  
Mumbai 400 079  
India  
Tel: +91 22 2578 3521/577 5846/579 5982  
Fax: +91 22 2577 2846

**MMM Buxabhoy & Co**  
140 Sarang Street  
1<sup>st</sup> Floor, Near Crawford Market  
Mumbai  
India  
Tel: +91 22 2344 2902  
Fax: +91 22 2345 2532  
[yusufs@vsnl.com](mailto:yusufs@vsnl.com); [mmmb@vsnl.com](mailto:mmmb@vsnl.com);  
[yusuf@mmmb.in](mailto:yusuf@mmmb.in)

**Narangs Corporation**  
India  
P-25 Connaught Place  
New Delhi 110 001  
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Tel: +91 11 2336 3547  
Fax: +91 11 2374 6705

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[enquiries@alvanblanch.co.uk](mailto:enquiries@alvanblanch.co.uk)  
[www.alvanblanch.co.uk](http://www.alvanblanch.co.uk)

**Mitchell Dryers Ltd**  
Denton Holme, Carlisle  
Cumbria  
CA2 5DU  
UK  
Tel: +44 1228 534433  
Fax: +44 1228 633555  
[webinfo@mitchell-dryers.co.uk](mailto:webinfo@mitchell-dryers.co.uk)  
<http://www.mitchell-dryers.co.uk/>

**Orbit Equipments Pvt Ltd**  
175 - B, Plassy Lane  
Bowenpally  
Secunderabad - 500011, Andhra Pradesh  
India  
Tel: +91 40 32504222  
Fax: +91 40 27742638  
<http://www.orbitequipments.com>

**Pharmaco Machines**  
Unit No. 4, S.No.25 A  
Opp Savali Dhaba, Nr.Indo-Max  
Nanded Phata, Off Sinhagad Rd.  
Pune - 411041  
India  
Tel: +91 20 65706009  
Fax: +91 20 24393377

**Rank and Company**  
India (see above)

**Banyong Engineering**  
94 Moo 4 Sukhaphibaon No 2 Rd  
Industrial Estate Bangchan  
Bankapi  
Thailand  
Tel: +66 2 5179215-9

**Technology and Equipment  
Development Centre (LIDUTA)**  
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technical brief

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Fax: +94 41 2222683  
[postmaster@cc.ruh.ac.lk](mailto:postmaster@cc.ruh.ac.lk)  
<http://www.ruh.ac.lk/>

### **Indian Institute of Spices Research (IISR)**

Marikunnu PO, Calicut  
Kerala  
India 673012  
Tel: +91 495 2731346  
+91 495 2730294  
[parthasarathy@iisr.org](mailto:parthasarathy@iisr.org); [rdinesh@iisr.org](mailto:rdinesh@iisr.org)  
<http://www.iisr.org/package/index.php?spice=Cinnamon&body=Overview>

### **Indian Institute of Technology (IIT) Bombay**

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Mumbai 400076  
India  
Tel: +91 22 2572 2545  
Fax: +91 22 2572 3480  
<http://www.ircc.iitb.ac.in/webnew/>

## Further reading

*Drying* - Practical Action Technical Brief

*Spice processing* - Practical Action Technical Brief

*Labeling food products* - Practical Action Technical Brief

### **Practical Action**

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