

# CLOVE PROCESSING

## Harvesting

Clove trees are first harvested when the tree is 6-8 years old. The timing of harvest of the clove buds is critical. The buds should be harvested before the purple or crimson flowers start to develop. The correct time of harvest is when the outer green leaves (the calyx) of the flower bud change from olive green to yellow pink and before the petals fall to expose the stamens. Clusters of flower buds are hand-picked from the branches. It is important that the branches are not removed or damaged as this will reduce the yield of future crops.



## Pre-treatment

After harvest the buds are detached from the stalks by holding a cluster in one hand, pressing it against the palm of the other hand and slowly twisting so that the buds fall off. The hands of the processor and the room in which the buds are separated must be very clean to prevent contamination of the cloves. The stems and buds are separated and dried separately. The stems can be used for oil distillation.

## Drying

The buds have to be dried quickly or they will start to ferment. They are usually dried in the sun, spread on clean mats. The cloves should be raked and turned frequently to ensure they develop an even brown colour. The colour of buds changes from pale russet to a darker brown as the clove dries. The drying process takes about four to five days. It cannot be speeded up or the cloves will

become dry, brittle and withered rather than plump. The final moisture content of the dried cloves should be 8-10%. Experienced clove driers will know when the cloves are fully dry as the buds will snap easily. During the rainy season, cloves should be dried using a mechanical drier such as a tray drier. Badly dried cloves are pale brown and classified as khuker.



### **Winnowing**

The dried buds are winnowed using a traditional winnowing basket to remove dust and other foreign matter. Small cleaning machines are available that use a blower to remove the dirt and dust.

### **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. Dried cloves are usually sold whole.

## Packaging

Cloves can be packaged in polythene bags of various sizes according to the market demand. 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 cloves must be stored in moisture-proof containers away from direct sunlight. It is essential that the cloves are fully dry before they are stored. Any moisture within the bags will cause the cloves to rot. The stored cloves 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 aroma and flavour of the cloves.

