

PROCESSING CACAO BEANS—SOME PROBLEMS OF THE GROWER

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During the last ten years there has been an increasing interest in growing cacao as a mixed crop in arecanut and coconut gardens. The present area under cacao in the country is estimated to be about 13,000 ha and the annual production around 500 tonnes. The production is expected to go up markedly in the next few years when more plantations would attain bearing stage.

Cacao beans deteriorate rapidly in quality after removal from the pods. Proper processing, namely, fermentation and drying of fresh beans is essential to develop and retain the characteristic chocolate flavour. Large scale planting of the crop was taken up in this country only during the seventies and no serious attention was paid to the processing aspects. Growers are not conversant with this technology. A majority of growers sell the wet beans as such to the cacao collection centres established by private firms who carry out the fermentation and drying of beans. Further processing and manufacture of desired products are carried out at the manufacturing factories of the firms. This system may not work satisfactorily for long to the advantage of the growers.

Unlike in other cacao growing countries, most of the cacao growers in India own small farms obtaining 25 to 50 kg fresh beans per harvest during peak season. Also a sizeable portion of the harvest of the year is gathered during the rainy season i.e. June to August. Development of an appropriate technique for proper fermentation of small quantities of cacao beans and of a suitable drier to dry the fermented beans will help the grower in enhancing his return from the crop.

Fermentation

The term indicates the process by which the mucilage or pulp covering fresh beans is got rid off with a view to imparting the characteristic chocolate flavour to the final product. It is also essential

to reduce the bitterness, kill the germ of the seed and loosen the cotyledons which then spread out. Fermentation should start within 24 hours after breaking the pods, otherwise fungi may enter the beans and affect the flavour and quality.

Basic requirements for satisfactory fermentation are: maintenance of heat, draining off sweatings and provision of adequate access to air. It is essential to turn the beans during fermentation to prevent mold growth on the surface and for uniform fermentation. Generally three methods of fermentation are adopted viz. baskets, boxes and trays.

Basket fermentation

In this method bamboo or cane baskets of required sizes are used for fermentation. The baskets are generally available in market in various sizes which can accommodate beans from 5 to 30 kg. Banana leaves are spread at the bottom of the basket, making a hole in the centre of the leaf. Fresh beans are then filled in the basket and covered with banana leaves at the top. The basket is then covered all around by gunny bags and some weight kept on the top. On the third and fifth day, the beans are to be either mixed up or transferred to another basket in order to mix the beans.

Box fermentation

Wooden boxes made of about 2.5 cm thick hard wood and perforated bottom are fabricated in various sizes as required. The height of the box should not exceed 45 cm as the beans when filled more than 45 cm deep will not get adequate aeration. A 45 × 45 × 45 cm size box can accommodate 50 kg fresh beans. The beans are filled in the box and covered with banana leaves and weight put over the leaves. The box is then covered with gunny bags. The beans should be thoroughly mixed or transferred to another box on the second and the fourth day.

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Tray fermentation

Though basket and box methods give satisfactory results, tray fermentation is known to give better results. Wooden trays of 2.5 cm thick hard wood are made in various sizes but height is limited to 15 cm. A 75 × 60 × 15 cm size tray can accommodate fresh beans up to 50 kg. The bottom of the tray is made of hard wood reapers of 3.5 × 2.0 cm size with a gap of 3 mm provided between the reapers for aeration and draining of sweatings. After filling with fresh beans the tray is covered first with banana leaves and then with gunny bags. Some weight over the gunny bags may be kept which helps in the fermentation process. The beans may be turned once on the third day.

Two days after initiating fermentation temperature rises about 45°C and it begins to fall when fermentation is complete. Fermentation of forestero beans is generally completed within 5 to 7 days depending upon weather conditions. Completion of fermentation is visually determined by the colour of external mucilage which should turn milky chocolate brown and also the beans when squeezed should give out a brown and not a purple liquid. The most common practice to judge the completion of fermentation process is by observing time schedule whereby the process is standardized to give the same result in a fixed time.

Most of the cacao growers in India own small farms and they do not get sufficient quantity of beans particularly during off-season harvests, for proper fermentation. It will be advisable for such growers to have a pooled or co-operative fermentary. The minimum quantity of beans required for satisfactory fermentation yielding beans of a quality acceptable to market is, in box method about 20 kg,

basket method 5 kg and in tray method about 5 to 10 kg. Satisfactory fermentation cannot be obtained if the quantity of beans is lesser.

Drying

The fermented beans are to be dried in the sun or by artificial means. In most places where the major harvest is gathered after the rainy season, drying is generally done in open sun. Beans are spread about 5 cm deep on drying platforms or mats and stirred 2.3 times a day to get uniformly dried beans. Many of the cacao growers in other countries are now adopting artificial means of drying to save time, space and labour. Properly dried beans, when pressed with the plam, produce the characteristic cracking sound and this is the most common method for determining the dryness of the beans. Under-dried beans are rubbery in nature which when pressed in its length-wise direction between thumb and finger, bend whereas dried beans do not. Beans should not be dried to below 7% moisture content as over drying also affects the quality.

During rainy season an artificial dryer is required. Attempts are being made at the Central Plantation Crops Research Institute, Kasaragod to develop a small dryer for 50—100 kg capacity fermented beans. The dryer is expected to cost Rs. 750/- and the cost of drying would come to 30 to 40 paise per kg of dry beans. It will be possible to operate the dryer either on fuel, oil, electricity or gobar gas.

After drying, the beans need to be properly stored in polythelene/plastic bags or containers that prevent entry of moisture from outside. Storing the beans by the grower will provide him the opportunity to sell the beans whenever he can get favourable market price.

CORRIGENDUM

It is notified for information that the last two words i.e. "or benzene" stand deleted from the note "How to make quality turmeric for export" appeared in the third cover page of the Indian Cocoa, Arecanut and Spices Journal, Vol. III, No. 2 (October-December, 1979)