NUTMEG PROCESSING

Harvesting

The ripe or mature fruit splits open at the groove while still on the tree and the seed surrounded by the red aril falls to the ground after two days. Harvesting involves collecting the seed or seed with aril from the ground. Sometimes fruits with partially opened pods may be picked from the tree using a long pole "rodding". The latter method affords a better quality aril, and pods that could be used in agro processing. This procedure may also lead to excessive dropping of flowers and young fruits.

The frequency with which nutmegs are harvested is dependent on the location of the field, the availability of labour, the level of production, and the price offered to farmers. Most farmers collect the fallen seeds daily during the two peak production periods - January to March and June to August, and every two to three days during the rest of the year. Once the field is readily accessible nutmegs are harvested with a higher frequency. In the cases where farmers are part-time, fields located in distant areas, or when the farm is comprised of several plots of land at different locations, then the collection rate may be as low as once per week. Observations show that a larger proportion of women are usually involved in harvesting.

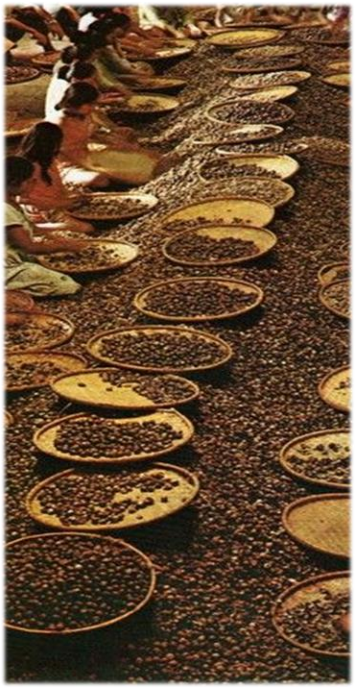
Post harvest handling operations in the field and preparation for marketing

In the case where rodding was used, open fruits may fall to the ground intact. The seed with the surrounding red aril is removed from the pod which oftentimes is discarded. The collected seeds, and seeds with mace are transported from the field by workers, on their heads or assisted by animal (donkey) or vehicle to the boucan or farmer's residence where the mace is carefully separated from the seed, graded and allowed to dry directly in the sun. Care is taken so that drying mace does not get wet. Wetting will encourage mould growth and such mace will have to be discarded.

The seeds are usually delivered green (fresh), within 24 hours after harvesting to the receiving station. However, depending on the distance from the receiving station and the quantities of nutmegs involved, deliveries may be made once weekly or at a much later period if the nutmegs are being delivered in the dry state. This is usually the situation with large estates with adequate drying facilities. Mace is always delivered to receiving station dried.

Sorting

On delivery at the receiving station the green nutmegs are emptied into sorting trays. These trays are wooden and four sided, 5 ft long by 2.11 wide and 9 inches deep with a slightly perforated wooden base and angled gently towards an emptying hole at one end, and standing on legs about 3 ft off the floor.



The inspector or inspectors spread out the seeds with a wooden pallet, and hand select out broken seeds, slightly discolored seeds, water-logged seeds, empty or rotten seeds, mouldy seeds, very light seeds and germinating seeds. These are usually returned to the delivering farmer

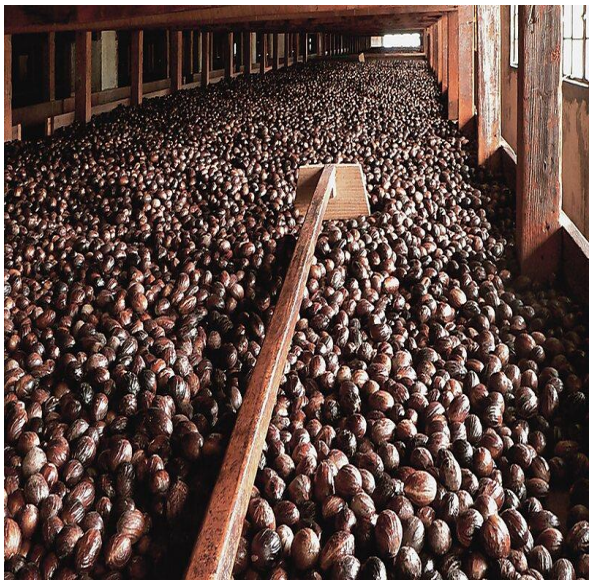
The remaining seeds are scooped into a receiving bag. When all of that particular farmer's consignment is sorted, the bag or bags are weighed and the weight entered into the farmer's assigned book and recorded at the station. The farmer is given a bill and is paid at whatever is the then rate per pound. At the end of the day all collected nutmegs are reweighed and checked against the weight paid out for, and this weight is entered in the "reweighed book" at the station.

Drying

Bags with about 45.5 kg of seeds are hand sewn at the top and carted to the hoisting area for lifting to the drying floors. Smaller quantities may be handled at the smaller receiving stations. Also at the peak periods or times of very high deliveries, nutmegs are transported from the receiving stations to the processing stations daily.

For drying, the fresh seeds are spread on large trays to a depth of 2-3 inches. The seeds are turned daily with wooden rakes or spades. Seeds are shade dried in

the buildings at a temperature of 29-32°C for six to eight weeks. Drying trays have wooden bottoms and wooden sides with periodic trap doors. Trays vary in size according to the station, but are usually arranged in tiers with about 4-8 trays above each other separated by 1 ft between trays. Trays are arranged so that there is always easy passage between stacks of trays to afford ready access to all seeds. However, for the higher trays workers have to climb up to gain access.



The energy for drying comes from the sun on the large galvanized roof of the station and the warm circulating air. Seeds closer to the roof tend to dry much faster. Drying completion is indicated by simple inspection. Usually after 6 weeks a sample of seeds is taken, these are cracked, cut with a knife and inspected for moisture. The characteristics looked for are rattling in shells, difficulty or ease to cut, degree of oiliness and intensity of the aromatic smell.

After the drying period and satisfaction with the inspection, the seeds are heaped in the trays close to a trap door which on raising allows easy scooping into bags. Each bag carrying 68 kg. Bags are sewn and dried nutmeg in shells are stored until an order is received

Cracking and Sorting

The other stages of the processing are carried out on the receipt of an order.

Most cracking is now done by cracking machine. The loaders empty bags of 50 kg into the feeder the machine cracks the seed coat and these are channelled to the right and left of the machine from where they are spread manually with a wooden spade so that the entire length of the sorting area could be supplied. As many as (90 - 100 bags) could be cracked in a day

Sorting is done manually. Workers seated at stools have cracked seeds fed to their work stations, via their individual trap doors which they operate.

Sorting and shelling generates four products which are compartmentalized by the sorter. The products are:

1. Whole kernels
2. Cracked kernels or pieces
3. Escapes - seeds with unbroken testa
4. Shells

Sorting is done by women and there may be as many as thirty two working simultaneously. The expected output is 77 kg per worker per day. However, most workers average 159-204 kg daily

Grading and Flotation

The first grading of shelled kernels is effected by flotation in water using the principle of varying density. The procedure is to place 20-30 lbs (914 kg) kernels in a wicker basket. The wicker basket is then immersed in water held in a concrete trough to a level just about I inch (2.54 cm) below its rim. The kernels are then agitated by hand. Once stirring stops, some kernels are seen to remain at the bottom of the basket while others float. All "floats" are removed as defectives along with any kernels seen to be moving or in suspension (doubtfuls). Workers (female) try to effect this in as short a time as possible. The kernels remaining at the bottom are classified as Sounds. The detectives (floats) are grouped, basketed and spread on trays to dry for 48-72 furs. The sounds are spread usually on the upper trays to dry for 24 furs. Both grades are turned twice daily while drying.

When detectives "floaters" are inspected by cutting in half, they usually show incomplete kernels (large airspaces, or whitish cork tissue with reduced brownish endosperm)

Sorting Sounds

The dried sounds are gathered and bagged, 68 kg and then manually sorted. This sorting is usually performed by female workers and each worker is expected to sort a minimum of 21/2, 45.5 kg bag per day. The sorter spreads the kernels in a wooden tray held in her lap and proceeds to separate three products, which are placed in three separate bags which surround her. The products are genuine sounds "heavies", defective heavies and shells. Constituting these detectives are kernels with pin holes, cracks or breaks (pieces). The sounds could be classified as sound "unassorted" (Suns).

Metal Sieve Grading

Using large metal sieves with uniform regular circular perforations and sieves of different sizes, workers pour on hand-graded sounds and gently massage them. The appropriate kernels fall through the appropriate holes into collecting bags

Fumigation

The final processing step for nutmegs before export is fumigation of the bagged nutmegs with methyl bromide in a special fumigation chamber over night.

Defectives

Sometimes the defectives "heavies" are sorted and exported separately.The "floats" after drying are heaped, then packed in bags and stored until an order for that class of product is received. For export they are then packed in labelled bags and fumigated.

Mace

The mace is then bagged according to grades and at the end of the day the separated grades are reweighed, the weights noted, and the mace placed in separate wooden curing bins and left for 3 months. Into each bin is suspended a bottle with carbon disulphide (CS_2) to keep away any insect pest

After the three months curing period the mace is now ready for export. The cured graded mace is bagged accordingly and fumigated