

Mace yield/tree (dry) : 4.5 kg  
 Nut yield /tree (dry) : 20.8 kg

#### Quality Attributes



Mace oil : 9.5 %  
 Mace oleoresin : 18.0 %  
 Kernel oil : 4.5 %  
 Kernel oleoresin : 29.4 %  
 Kernel butter : 28.1 %

Budded plants of these high yielding varieties of nutmeg are available in the Model Nursery of Spices at Kerala Agricultural University main campus at Vellanikkara as well as from the respective farmers. The Model Nursery can be contacted at 8078193785.



## Harvesting Nutmeg More Efficiently

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**T**he peak harvesting period of nutmeg in South India is from June to September, which coincides with the heavy monsoon season. The fruits are harvested when the pericarp splits open exposing the red aril. The split fruits are either plucked from the tree with a bill hook or collected after they drop on the ground. After harvest, the rind is removed from the fruit and both the nut and mace are separated manually, washed with clean water, drained and then dried and packed in air tight containers.

Different things that happen during harvest and post-harvest processing can affect the

quality of nutmeg. As majority of the fruits are harvested during rainy season, there are chances of fruits falling to ground either while harvesting using bill hook or while raining. Either way, if the fallen nut and mace get in contact with the soil, the chances of *Aspergillus* infection are more. This could lead to aflatoxin contamination during storage, if not dried properly to the required moisture level. Spices Board, Government of India has conducted awareness programs at major producing centers of nutmeg to address aflatoxin contamination in nutmeg and the campaign stressed the need of Good Agricultural and post-harvest Practices, including mechanical drying and

proper packaging and storage to prevent aflatoxin in nut and mace.

Pre-split harvest of mature fruits and inducing synchronous splitting of harvested fruits can check nut and mace from being contaminated during harvest, as this prevents soil contact of nut and mace. A simple technique of hormone treatment was developed at ICAR-Indian Institute of Spices Research, Kozhikode for synchronous splitting of fruits and to separate nut and mace without exposure to soil.



Harvested closed nutmeg fruits

### Methodology

- Harvest the physiologically mature fruits when the colour of the rind changes from green to pale yellow or yellow (depending on the pericarp colour during maturity) (Fig.1).
- Dip the harvested fruits in 500 ppm ethrel (2- chloroethylphosphonic acid) solution for 10 minutes.
- Drain the solution.
- Store the fruits in a shady and cool place.
- 90-100 % of fruits will split open in 18-20 hours (Fig. 2).
- Separate the mace and nut from the fruit by removing the pericarp.
- Dry the nut and mace to the required level of moisture content.
- Store the dried nut and mace in air tight containers.

### Advantages of this Method

- It is very simple and can be easily practiced by farmers.
- It saves time, labour and money for farmers both for harvesting and processing as daily harvesting of fruits need not be undertaken.
- The method is very effective in preventing aflatoxin contamination, thus enhancing the export value of nut and mace.
- Prevents loss caused by the attack of mace by birds and rodents.
- The quality in terms of nut and mace dry weights, essential oil and oleoresin contents are comparable with that of naturally split fruits.

Care should be taken to harvest fully mature fruits which are about to open in a week's time.



Split opened fruits after ethrel treatment

This requires observation and intuition gathered through experience. The entire fruit should be dipped in ethrel solution for 10 minutes only. There are no known health hazards to consumers as the fruit pericarp is very thick and may not allow ethrel to percolate to mace and nut. The cost of ethrel treatment is a meagre Rs 900-1000 per ton of fruits. Hence, this can be used as an effective technology for synchronous splitting of physiologically mature fruits, while preventing aflatoxin contamination. This will enhance the export value of both the nut and the mace considerably.

