

IFEAT

SOCIO-ECONOMIC REPORT ON NUTMEG

The IFEAT Socio-Economic Committee is once again pleased to bring you the second in our new series of socio-economic reports on naturals

NUTMEG

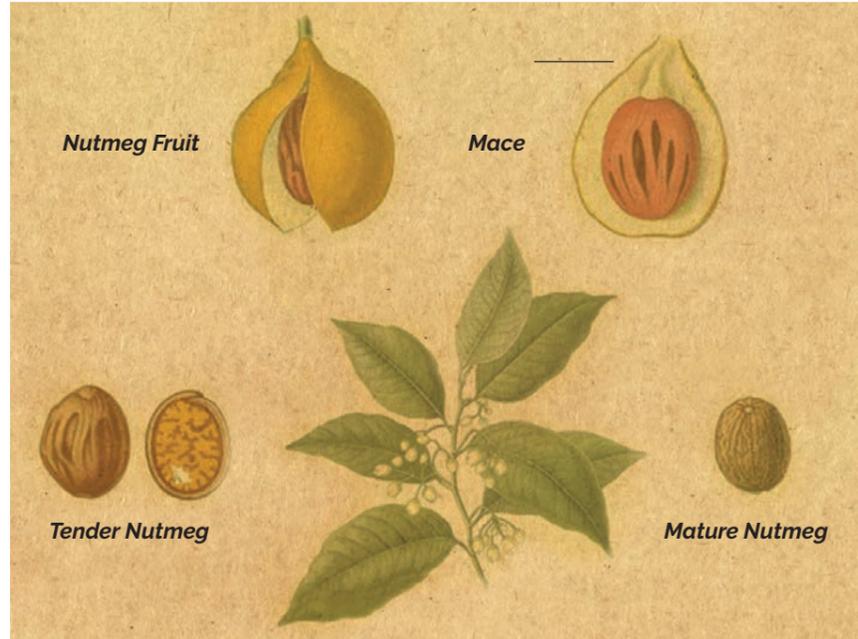
Myristica fragrans Houtt
Family: Myristicaceae

INTRODUCTION

The nutmeg tree is a dioecious evergreen tree called *M. fragrans* Houtt, which is native to the Moluccas (or Spice Islands) of Indonesia. The nutmeg tree is unique among spices, as the contributor of two distinct spices of commerce - nutmeg and mace. Nutmeg is the seed of the apricot-like fruit of the tree and mace is its dried aril - a thin leathery red-coloured webbing over the seed. Both spices are strongly aromatic, resinous, and slightly warm and sweet in taste. Mace is generally said to have a finer aroma than nutmeg. This report mainly focuses on nutmeg and its characteristics.

The English word 'nutmeg' is said to come from the Latin *nux* meaning nut and *muscar* meaning musky.

Nutmeg has multiple uses, mainly as a spice followed by as an essential oil - it is used in the form of an oleoresin, an essential oil, powdered or crushed and whole, in food and in medicine. The characteristic warm, sweet taste of nutmeg makes it a flavour ingredient in culinary applications - baked goods, puddings, meat, dairy products, soups, spice mixes, beverages, candies, chewing gum, etc. Nutmeg essential oil, because of its aroma, is used as a perfume in the cosmetic industry; it is also used in place of ground nutmeg to avoid leaving particles in foods and beverages. About 80-90 per cent of the nutmeg oil processed is used for flavouring beverages. Nutmeg also has applications in pharmaceutical products - used in ointments and topical applications for arthritis-related conditions. In some countries the fresh pericarp is used for making pickles, jams and jellies.



VARIOUS PARTS OF THE NUTMEG FRUIT
- Van Aroma

In addition to having widespread use in flavourings, current research seems to focus on the potential use of nutmeg and its essential oil as food preservatives.

Indonesia dominates the world production of nutmeg, with approximately 70 per cent of global production, but it is also commercially produced in India, Sri Lanka, and Grenada.

GROWTH AND HARVEST

Nutmeg requires a hot, humid climate without a pronounced dry season, with an annual rainfall of 150 cm and more. Areas with clay loam, sandy loam and red laterite soils are ideal for its growth. Unlike labour intensive crops, such as vanilla, nutmeg is relatively easy to maintain and harvest.

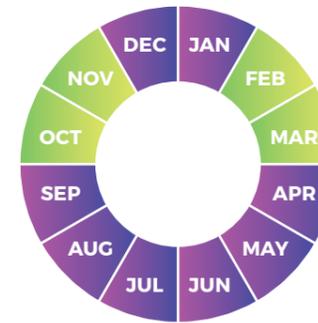
The female nutmeg tree starts bearing fruit from the fifth or sixth year but may take up to eight years. It takes about

15 to 20 years to reach full production depending on favourable climatic conditions. The tree continues to yield well for 10 to 20 years and sometimes even longer, based on the climate and upkeep. A fully grown nutmeg tree produces about 2,000 to 3,000 fruits per year.

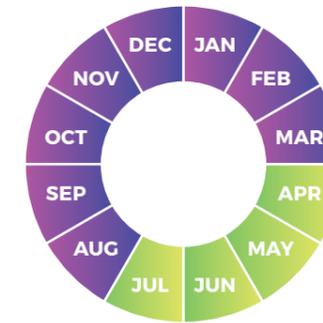


NUTMEG FRUIT
with the pericarp split open
- Van Aroma

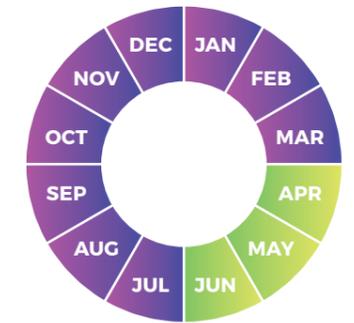
HARVEST CALENDAR



INDONESIA



INDIA



SRI LANKA

Once ripe, the fruit splits open naturally, revealing the mace, indicating that it is due for harvesting and drying. The nutmeg fruit is either plucked from the tree or allowed to drop on the ground and is handpicked. Tender nutmeg for distillation purposes is harvested within five months, while spice grade nutmeg is harvested after seven to eight months. Depending on rain patterns and when the fruits are ready for collection, harvesting is done in different areas at different times of the year; so nutmeg oil is available all year round.

PROCESSING CHARACTERISTICS

Once the fruits are harvested, the pericarp is depleted, the mace from the nutmeg is separated, and the nut

and mace are dried separately. The "blades of mace", as the peelings are called, are flattened by hand and are spread out to dry in the sun. Exposure is limited to a few hours per day depending on weather and ranges between two to three days to a fortnight. The original brilliant red colour gradually becomes yellowish red or orange when the drying is completed. Meanwhile, the seeds undergo a two-step drying process - firstly, the seeds are dried, either in the sun or in drying ovens, and drying is complete when the seed rattles within the shell. Secondly, the shell is removed by breaking using wooden mallets and the kernels are taken out and shade dried.

These processes take place as soon as the fruits are plucked and

are mostly done at farm level by the farmers and their family members. Even though nutmeg is an easy crop to grow and harvest, the post-harvest processes are labour intensive. Most processes such as plucking/picking the fruit, removal of the mace, cracking of the shell, drying etc, are done manually.

After drying, they are crushed and steam distilled together to produce nutmeg oil. Yields can vary between 12 to 15 per cent, depending upon the maturity of the nutmeg. Nutmeg oil yields both lighter oil, which floats above the water, and heavier oil which sinks to the bottom (as the volatile components of nutmeg oil have varying densities). Both oils need to be collected and then blended to obtain the desired quality of nutmeg oil.



MACE BEFORE DRYING
- Spices Board of India



1. NUTMEG WITH THE SHELL
- Spices Board of India

PRODUCTION AND SOCIO-ECONOMIC CHARACTERISTICS

Indonesia

Indonesia started the production of nutmeg and mace in the 17th and 18th centuries and has dominated the global trade for these spices for a long time. Indonesian nutmeg is categorised into two types, according to its form of use and geographical origin:

1. Tender nutmeg from the provinces of Aceh and West Java are best suited for distillation and meet the specifications of the F&F industry.
2. Mature nutmeg from the Spice Islands/Sulawesi region are better suited for the spice market.

As per the 2017 estimates, the total nutmeg plantation in Indonesia is around 169,103 hectares (ha), with total production of 34,602 MT (Directorate General of Estate Crops-Ministry of

Agriculture, Indonesia, 2017), i.e. an average yield of about 200 kgs/ha. In the case of nutmeg oil, Indonesia is the largest producer with annual exports of 350-400 MT.

Most farmers who have planted nutmeg, have been making a living from it for several generations. Out of the 169,103 ha cultivated in Indonesia, the majority is owned by smallholders. On average small plantations are around 0.5-10 ha, while large ones can be up to 100 ha. Small plantations are managed by the owner and their family (around 10 people), but larger plantations need help from other farmers (15-30 farmers, depending on the land size).

In Indonesia, both nutmeg and mace are viewed as cash crops improving the standards of living of Indonesian farmers. It is difficult to have precise information on the number of farmers involved in nutmeg cultivation, but it can be estimated that the livelihood of more than 200,000 people depends on nutmeg crops.

Over the last 15 years, the price of Indonesian nutmeg oil has been varying between USD 40 to 75 per kg. On average, prices have remained close to USD 55 per kg. The sustainable price level for nutmeg oil is USD 50 to 60 per kg and anything below this level is close to being unsustainable.



2. NUTMEG TREE
in a farm in Kerala

India

In India, nutmeg is predominantly grown in the southern state of Kerala, and has now spread to the eastern state of Andhra Pradesh and to the north eastern part of India. In 2018 production was 15,470 MT spread over 23,840 ha (Spices Board, 2018). Average productivity in India has been around 650 kgs/ha.

The majority of farmer holdings, about 85 to 90 per cent, are smallholdings and on average, would be less than half a hectare.

Nutmeg is grown in a multicropping mode along with other spices and crops and it is seen as a cash crop. In Kerala, nutmeg is grown mostly in homesteads and contributes a substantial income to the households. According to the Directorate of Arecanut & Spices Development, the main growing area in Kerala has about 50,000 farmers engaged in nutmeg production.

About six years ago, the presence of aflatoxin in nutmeg was a major problem. This was due to high moisture content after drying, owing to improper harvest or monsoons during the drying period. This problem has been mostly mitigated with several actions on the field, through the intervention of the World Spice Organisation (WSO), the agri-arm of the ALL India Spice Exporters Forum, the trade body. This has given a shot in the arm to the nutmeg producers.

Sri Lanka

Nutmeg is reported to have been introduced to Sri Lanka at the beginning of the 19th century and the country currently has a nutmeg production of about 5,000 MT (Department of Census and Statistics, DEA, Government of Sri Lanka). The average production in Sri Lanka is about 190 kgs/ha.

There are several issues for nutmeg production in Sri Lanka - high cost of production due to labour scarcity, increased cost of land due to competition for land from other commercial crops and low yield. In Sri Lanka, nutmeg cultivation is largely restricted to mixed home gardens and there is a lack of interest in replanting many of the old and senile trees due to low returns and the high cost of cultivation.

In Sri Lanka, according to a survey conducted by the Department of Census and Statistics in 2014, the total number of operators engaged in the entire nutmeg cultivation value chain is about 84,672.

Grenada

In 1843 nutmeg was introduced into Grenada, often known as the "Island of Spices". For many years it was the world's second largest nutmeg and mace producer, accounting for approximately twenty per cent of global production with annual output in excess of 2,000 MT. Known as "black gold" it was the country's

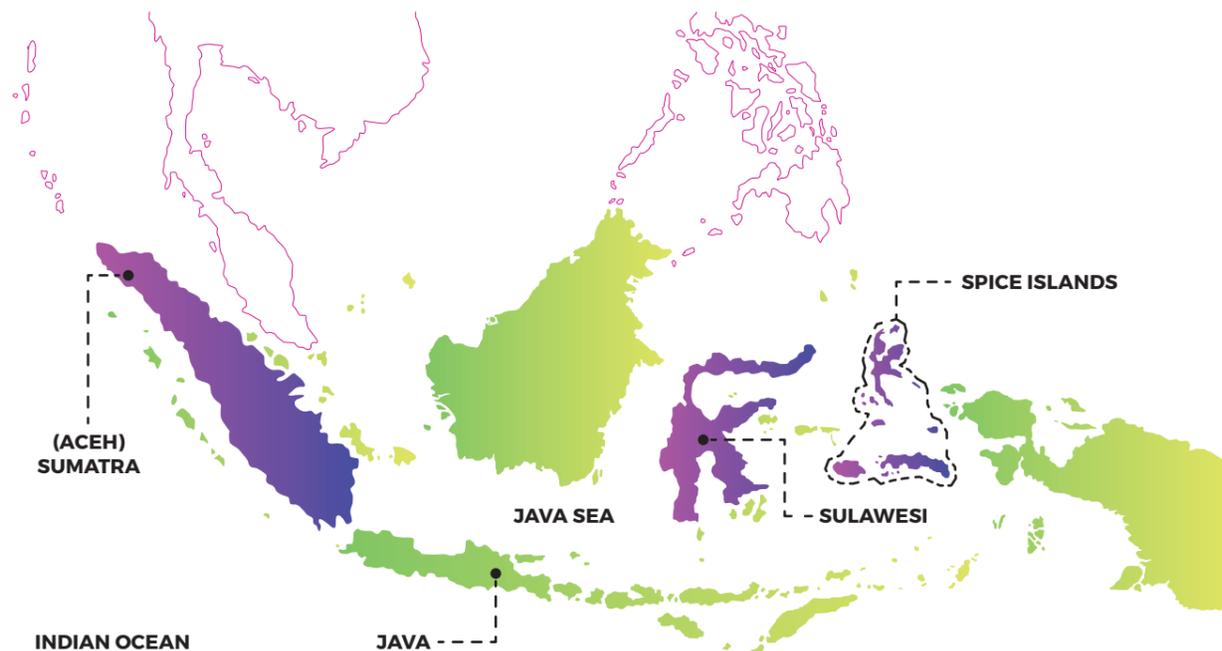


3. NUTMEG FRUIT
- Spices Board of India

largest agricultural export and a nutmeg is pictured on the national flag. Internationally, it sold at a premium as buyers preferred Grenada's nutmeg and mace because of their superior quality. Unlike some origins it had no aflatoxins and negligible safrole and agricultural residues alongside excellent traceability. While production is undertaken by private sector smallholder farmers, the farmer-owned and run Grenada Cooperative Nutmeg Association (GCNA) is the principal player in the sector and is the sole export marketing agency.

Alongside logistical issues, the sector faces a number of challenges - hurricanes, crop disease and an ageing farmer population. The sector was dealt a devastating blow when Hurricanes Ivan and Emily struck the island in September 2004 and July 2005 respectively. GCNA data show that 90% of the total estimated 555,000 nutmeg trees pre-Ivan were damaged. Some 30% were completely uprooted, about 30% partially and a further 30% lost branches and leaves. A later agricultural census showed 198,798 trees bearing nutmeg - equivalent to 2,557 acres. The devastation led to a fall in employment from over 7,000 farmers pre-2004 to about 2,500 active farmers. A large majority of farmers have less than two ha of land and no more than 300 have holdings over five ha. Moreover, most Grenadian farmers are of an advanced age, averaging over 60 years. The younger generation has shown little interest in agriculture but

NUTMEG GROWING AREAS OF INDONESIA



rather the expanding service sector, particularly tourism, which offers much better remuneration. Grenada wage levels are substantially higher than other nutmeg origins. Perhaps the recent COVID-19 pandemic could change attitudes, in part influenced by the recent collapse of the tourist sector. In addition, "nutmeg wilt disease" has created further problems.

In 2019 the GCNA purchased almost 600 MT for export and further agro-processing. Grenada used to distil nutmeg oil but there were problems with the equipment's efficiency, even prior to the hurricane damage. No oil has been produced for the last decade. Nutmeg is considered an environmentally friendly crop - being relatively resistant to drought, it protects the soil and watersheds and sequesters carbon. However, it is one of the most vulnerable spices in extreme weather, in part because of shallow roots and a long gestation period with new trees taking up to 20 years to reach full yield. In recent years, strategic and technical initiatives by government and aid agencies have been undertaken to try to revive the sector, protect the crop and raise yields. Grenada nutmeg yields were quite high (579 kg/ha) but a sizeable proportion of production goes unharvested. The value of nutmeg to Grenada is not limited to agriculture, it is part of the Grenadian culture and has contributed to the lifestyle, employment and income of the population for decades.

CONCLUSIONS

One challenge of nutmeg is that the price of nutmeg oil is highly dependent on the price of nutmeg as a spice. When the price of nutmeg as a spice increases drastically, farmers tend to hold back the harvest expecting better realisation as a spice and collect more mature nutmeg. This creates a challenge for the supply of nutmeg oil.

Another challenge is that the demand for cola beverages that use nutmeg oil in their formulation has been stagnant or reducing in developed countries. Hence the annual demand for nutmeg oil has been stagnant over the past few years.

In many ways the nutmeg crop is similar to clove - it has been around for centuries as it serves as a good income stream for farmers, distillers, and traders alike and has diversified uses in food, beverages and pharma. However, demand has been stagnant for a while, and any drastic change would depend on innovation, new product development and customer trends.

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The details for this report have been compiled and collated by Geemon Korah and the Mane Kancor team.

