Nutmeg - A Suitable Mixed Crop for Coconut Garden

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Introduction

Coconut is a high value commercial crop grown in 17 states and 3 ion territories in our country. About per cent of the total area and roduction in the country is ncentrated in Kerala, Tamil Nadu, arnataka and Andhra Pradesh.

In Kerala, 90 per cent of the holdings e less than 1.0 ha and in Karanataka d Tamil Nadu, 95 per cent of the ldings are less than 1.25 ha. nstraints for productivity in major coconut growing state of Kerala ntinue to remain the same and shall e a major concern and issue to be dressed in the years to come. One of e main reasons for low productivity coconut in Kerala is the root (wilt) ease. It is caused by Phytoplasma, vascular limited pathogen by ttensive light and electron croscopic and transmission studies d has no definite control measures. oductivity of coconut in Kerala is as w as 6188 nuts per hectare due to the ct that, root (wilt) disease is prevalent eight southern districts with varying gree of intensity as well as improper anagement practices in coconut rdens. Recent survey indicated that e disease has spread to Northern rts of Kerala, Tamil Nadu, Goa and rnataka states also. However, the aring palms which are in the initial middle stage of disease intensity sponded well to the management actices. Suitable management actices have been evolved to sustain e productivity of root (wilt) affected conut palms.

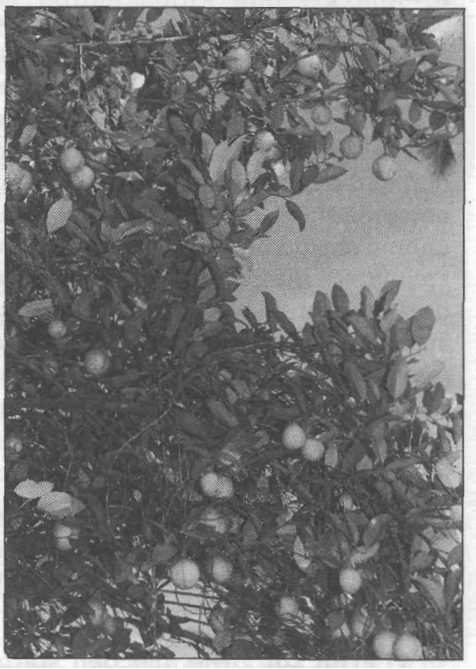
In recent years many coconut mers have suffered economic difficulties due to unstable copra prices in the world and local markets and occurrence of pest and diseases. Being a small holders' crop in India, coconut does not provide adequate income and gainful employment to the dependent families. In a situation where the coconut industry is threatened with recurring uncertainties, the need for a farm practice that augments the coconut farm income becomes clear and urgent.

In coconut holdings spaced at 7.5 x 7.5 m apart, nearly 75 per cent of the land goes unused by the palm. In more than 25 years old garden, 45-50 per cent of the sunlight is infiltrated on to grounds without interception by the coconut. In order to utilize the natural resources like light, soil nutrients and water efficiently the practice of inter/ mixed cropping is followed in one or the other way by coconut farmers, but the management is not always scientific. Coconut based cropping system is an important and most relevant activity in the present day context of sustaining income from a unit area. To increase the productivity along with returns per unit area, growing different suitable crops as intercrops in coconut garden plays an important role. Unfortunately, only a few farmers practise intercropping/ mixed cropping in coconut gardens. Cropping systems involving different crops, ensure additional employment and income in addition to improvement in the soil properties.

Studies were conducted at CPCRI Regional Station, Kayangulam with nutmeg as mixed crop in root (wilt) affected garden along with banana, pineapple and tuber crops in a high density multi species cropping (HDMSCS) model. In this article brief description of the nutmeg crop, management techniques and its uses are explained below for the benefit of coconut farmers.

Nutmeg (*Myristica fragrans* Houtt. Family : Myristicaceae)

Nutmeg is a native of the eastern islands of Moluccas (Indonesia) and is now grown in many tropical countries of the world. The nutmeg tree is unique among the spice plants, as it produces two distinct spices, the nutmeg (seed) and the mace (aril). The economic part is single seeded fruit. The fruit is fleshy drupe, resembling a large apricot, is usually pendulous, broadly pyriform, yellow, smooth, 6-9 cm long and nearly as broad, when ripe, as one of the most beautiful fruits in nature. The fruits ripe



View of fully bearing nutmeg tree

nior scientist (Agronomy)
ntist (Senior Scale) (Ag. Extension).

6 to 9 months after flowering, usually with two peaks of fruiting annually. When ripe, the succulent, aromatic yellow pericarp, about 1.3 cm thick, splits into two halves along the suture to expose the purplish-brown, shiny testa, surrounded by a much lacinate red aril attached to the base of the seed. The stout brittle testa encloses a broadly ovoid, greyish-brown kernel, about 2-3 cm long and 1.5-2.0 cm broad. The exterior of the kernel is longitudinally wrinkled and consists of convoluted dark-brown perisperm, a lighter-coloured endosperm and a small embryo.

Agrotechniques

Nutmeg thrives well in humid tropical climate from sea level to about 1000 m above MSL and prefer sheltered valleys, or hot moist climate. Well drained soils rich in humus are ideal for nutmeg. However, friable clayey loams, sandy loams, laterite and red soils are also suitable for its cultivation.

Twelve months old grafts should be planted at the centre of four coconut palms in pits of 60-75 cm cube during the south west monsoon period. Apply compost/FYM @ 10 kg/tree/annum and the recommended fertilizer dose of N:P:K @ 20:18:50 g/plant during the first year and N:P:K @ 40:36:100 g/plant during the second year. From third year onwards N:P:K @ 500:250:1000 g/tree/annum should be applied in two equal splits (50% during May-June and 50% during September-October). During summer months, it is necessary to provide mulching with dried leaves or coconut husks and requires regular irrigation during summer months.

Diseases and Pests

Diseases are more serious than pests in nutmeg cultivation. Diseases like fruit rot and die back inflict heavy loss in crop production.

1) Fruit rot : The infection starts from pedicel as dark lesions. They gradually spread to the fruit causing brownish discoloration of the rind resulting in rotting. In advanced stages, the mace also rots emitting a foul smell. *Pytophthora* has been isolated from such affected fruits. Spraying with one per cent bordeaux mixture or 0.5 per cent mancozeb have been found to be effective to control the disease.

2) Die-back : This disease is characterized by rotting of leaves and tender shoots. The leaves fall off. The rotting proceeds downwards causing drying of mature and immature branches from the tip downwards. *Diplodia natalensis* has been reported to cause die back. Control measures include cutting and removal of severely affected branches and applying bordeaux paste on the cut surfaces and spraying the trees with one per cent bordeaux mixture.

Harvesting and Processing

The nutmeg seedlings generally grow slowly. Well managed trees start flowering from 5th year onwards and yield increases with age, the most productive period being between the 15th and 50th year. Some trees may continue to yield well even after 50 years. Fruits are ready for harvest in about nine months after flowering. Flowering and harvesting continue throughout the year. But June-August is the peak period of harvest in India. When the fruit is ripe and ready for harvest the pericarp splits open. Well managed tree yields as much as 200 to 500 fruits in the initial years and latter 500 to 2000 fruits annually. Individual fruits weigh on an average 60 g of which the seed weight is six to seven g, mace comes to one- three g and the rest is pericarp. The collected fruits are brought to the drying area and spread out to avoid fermentation. The nuts, including the mace, are carefully removed from the rind. The mace is detached from the seed shell by hand or with a knife and flattened out to dry slowly in the sun for eight to 10 days. During drying, mace gradually becomes brittle, and the colour turns from scarlet to orange and then to yellowish brown. It is during curing, mace acquires pungent aroma. After the removal of mace, the unshelled nutmeg seeds are dried separately for four to eight weeks in the sun till the kernel rattles in the shell. Shell is then broken with a wooden mallet and the nutmeg is taken out.

Uses : The two major primary products are internationally traded nutmeg and mace, the seed and the aril surrounding the testa in the fruit. Mace is used as a culinary spice but largely as a flavouring agent. It contains the volatile oil "macine". The fleshy rind is used for pickling when fruit is at tender stage. Fresh rind of the ripe fruit can be used for making jelly. Medicinally, nutmeg acts as stimulant and carminative. Its uses as an abortifacient is also reported. Nutmeg has both volatile oil as well as fixed oil.

The volatile oil is extracted for use in medicine, toilet soaps, dental pastes and for flavouring chewing gums as well as chewing tobacco. Fixed oil is 25 to 40 per cent and is known as Oleum myristicae expressum. The oil is used for flavouring baked goods cakes, cookies, puddings and pickles. The oil has been recommended for the treatment of inflammations of bladder and urinary tract. It is used in the manufacture of scented oils, perfumes and soaps and as a flavouring agent in cooking and confectionery. One of the characteristic features of the fixed oil of nutmeg is that it does not turn rancid even after long storage, as essential oil is present only in traces.

Conclusion

Cultivation of nutmeg in coconut garden will provide additional returns to the farmer. If nutmeg tree yields 200 fruits per tree in a year, farmer can expect a gross income of Rs. 500 from a single tree at the present market price. Therefore, nutmeg can be grown as mixed crop in coconut garden for higher productivity and income.