The Complete Book on Coconut & Coconut Products
(Cultivation and Processing)
Coconut is one of the oldest crops grown in India and presently covers 1.5 million hectares in this country. Found across much of the tropic and subtropical area, the coconut is known for its great versatility as seen in the many domestic, commercial, and industrial uses of its different parts. Coconuts are part of the daily diet of many people. Its endosperm is initially in its nuclear phase suspended within the coconut water. As development continues, cellular layers of endosperm deposit along the walls of the coconut, becoming the edible coconut flesh. When dried, the coconut flesh is called copra. The oil and milk derived from it are commonly used in cooking and frying; coconut oil is also widely used in soaps and cosmetics. The clear liquid coconut water within is a refreshing drink and can be processed to create alcohol. The husks and leaves can be used as material to make a variety of products for furnishing and decorating. It also has cultural and religious significance in many societies that use it. India stands third in the production of coconut in the world. There are only two distinguishable varieties of coconut; the tall and the dwarf. As a result of cross pollination in the tails, a wide range of variations occur within the same variety. Coconut based cropping/farming systems promote on farm diversity and strengthens ecological base of coconut farming. Coconut husk is the raw material for the coir industry. It is also used as a domestic fuel and as a fuel in copra kilns. Coconut oil comes under edible/industrial group, is used as cooking oil, hair oil, massage oil and industrial oil. It is dominated by saturated fats and high percentage of lauric acid. India accounts for the 18% of total coconut production in the world and it is the third largest coconut producing country in the world. Coconut processing adds value, and a number of products like coconut oil, desiccated coconut, coir fibre, pith, mattresses, desiccated coconut (DC), coconut cream, coconut milk, spray dried coconut milk powder, coconut shell products, shell charcoal, shell powder, virgin coconut oil are obtained. The demand for coconut oil increases 15 to 20 % during the festival season. Coconut oil for edible purposes is now being claimed to be the second best edible oil in the world, after Olive oil. Coconut shell charcoal is most widely used as domestic and industrial fuel.

Some of the fundamentals of the book are product diversification in coconut, future of coconut oil, scope for product diversification, varieties of coconut, farming systems in coconut, organic farming of coconut, spices and herbs, establishment and maintenance of organic coconut plantations, production of organic spices, medicinal and aromatic plants along with coconut, crop improvement, green manuring in coconut garden organic recycling in coconut, soil moisture conservation in coconut garden, harvest and post harvest technology, integrated farming in coconut holdings for productivity improvement, machinery and processing of desiccated coconut, coconut processing sector in India, etc.

Coconut plays an important role in the economic, social and cultural activities of millions of people in our country. India is a major producer of coconut in the world. Coconut provides food, edible oil, industrial oil and health drink to humanity. All parts of coconut tree is useful in one way or other and the crop profoundly influences the socio economic security of millions of farm families. The present book contains the methods of cultivation and processing of coconut. This book is very beneficial for agriculturist, researchers, professionals, entrepreneurs, agriculture universities etc.

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Farming Systems in Coconut

A perennial crop like coconut, which is committed to the land for decades, utilizes the natural resources like light, water and nutrients only to a very limited extent due to the peculiarity of its rooting pattern and canopy structure. Therefore, there is scope for exploiting the unutilized natural resources in a coconut garden so as to enhance the income of coconut farmer.

ROOTING PATTERN

The rooting pattern of coconut is such that only 25 percent of land area is effectively utilized. A spacing of 7.5 m in the square system is recommended for coconut (175 palms/ha) for optimum production. Coconut palm, like other monocots, has a typical adventitious root system. Under favourable conditions, as many as 4000 to 7000 roots are found in the middle aged palms. About 74 percent of these roots produced by a palm under good management do not go beyond 2 m lateral distance (Fig. 1) and 82 per cent of the roots are confined to 30 to 120 cm depth of soil. Thus, the active root zone of coconut is confined to 25 percent of the available land area and the remaining area could be profitably exploited for raising inter/mixed crops.

CROWN STRUCTURE AND LIGHT TRANSMISSION

As coconut canopy’s space utilization is very low (Fig. 2), plenty of sunlight infiltrates and falls on the ground unutilized. The venetian structure of the coconut crown and the orientation of leaves allow part of the incident solar radiation to pass through the canopy and fall on the ground. In an inter/mixed cropping system, light is the major limiting factor for the growth of inter/mixed crops since light penetration is reduced through interception and absorption by the taller canopy plants. The light interception in a cropping system influences the growth, productivity and biomass production of the component crops. Although the full yield potential cannot be realized in many crops under the system as much as that obtained under monocropping system, the reduced yield itself is indicative of their adaptability to low light profiles. Age, spacing, soil fertility, varietal characteristics, leaf area and time of the day influence the light penetration through the canopy. It has been estimated that as much as 56 percent of the sunlight is transmitted through the canopy during the peak hours (10.00-16.00 hrs.) in palms aged around 25 years. The diffused sunlight facilitates growing a number of shade tolerant crops in the interspaces. The nature and amount of sunlight
transmitted through coconut canopy and falling on the ground shows temporal as well as spatial variations. The angle of the sun rays influences the amount of light passing through the coconut canopy. The distribution of light at different positions in the canopy zone of coconut varies much because of the non-random distribution of leaves. This causes differences in the growth and yield of intercrops at different positions of the plantation floor.

Based on the growth habit of the palm and the amount of light transmitted through its canopy, the life span of coconut palm could be divided into three distinct phases from the point of view of intercropping (Fig. 3).
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