

The Complete Book on Coconut & Coconut Products (Cultivation and Processing)

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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.

1. PRODUCT DIVERSIFICATION IN COCONUT

Future of Coconut Oil

Scope for Product Diversification

Philippines

Sri Lanka

India

Other Uses

Conclusion

2. VARIETIES OF COCONUT

Tall Variety

West Coast Tall

East Coast Tall

Lakshadweep Ordinary

Lakshadweep Micro

Andaman Ordinary

Andaman Giant

Kappadam

Laguna

San Ramon

Macapuno

Spicata

Performance of exotic cultivars under Indian conditions

Dwarf Variety

Ghowghat Green Dwarf

Chowghat Orange Dwarf

Malyan Dwarf

Gangabondam

Ayiramkachi

Thembili (King Coconut)

Coonino

Mangipod

Niuleka

3. FARMING SYSTEMS IN COCONUT

Rooting Pattern

Crown Structure And Light Transmission

Water Use Efficiency

Nutrients

Choice of Inter / Mixed Crops

Criteria For Selection Of Inter/

Mixed Crops

4. ORGANIC FARMING OF COCONUT, SPICES AND HERBS

Organic Coconut Scenario

Scope For Organic Production of Coconut In India

Characteristics of A Typical Organic

Coconut Farm

Establishment And Maintenance of Organic Coconut Plantations

Conversion Period

Buffer Zone

Choice of Varieties

Raising Nursery

Land Preparation

Preparations for Planting

Aftercare of the Young Plantation

Nutrient Management

Green Manuring and Cover Cropping

Utilization of Waste from Coconut Palm

Improving Soil Conditions

Plant Protection

Biopesticides

Contamination Control

Soil and Water Conservation

Bee Keeping

Animal Husbandry

Conversion of Established Plantations

Conversion Period

Choice of Cultivars/Varieties

Composting of On-farm Crop Residues/

Farm Wastes

Nutrition Management

Weed Management

Processing of Organic Coconut

Production of Organic Spices, Medicinal And Aromatic

Plants Along With

Coconut

Certification of Organic Products

5. PLANTING MATERIAL

Collection of Seednuts

Raising Nursery

Nursery Care

Seedling Selection

Polybag Nursery

Care of Polybag Nursery

6. GARDEN ESTABLISHMENT

Site Selection

Time of Planting

Planting System

Land Preparation And Preparation of Pits For Planting

Replacement of Unproductive Palms
Replanting
Under Planting
After Care

7. CROP IMPROVEMENT

Varieties

Tall Group

West Coast Tall

East Coast Tall

Lakshadweep Ordinary

Lakshadweep Micro

Andaman Ordinary

Kappadam

VPM-3

ALR (CN) 1

Dwarf Group

Dwarf Green

Dwarf Orange

Malayan Dwarf

Gangabondan

Choughat Orange Dwarf

Tall And Dwarf Hybrids

VHC 1

VHC 2

VHC 3

8. CROP PROTECTION

Insect Pests

Rhinoceros Beetle, *Oryctes rhinoceros* L.

Management

Red Palm Weevil, *Rhynchophorus ferrugineus* Oliv. (Curculionidae: Coleoptera)

Management

Black Headed Caterpillar, *Opisina arenosella* Meyr. (Cryptophasidae: Lepidoptera)

Management

Termite, *Odontotermes obesus* Ramb. (Termitidae: Isoptera)

Management

Lacewing Bug, *Stephanitis typicus* Dist. (Tingidae: Hemiptera)

Scale Insect, *Aspidiotus destructor* Sign. (Diaspididae: Hemiptera)

Management

Mealybug, *Pseudococcus longispinus* (T.),

P. citriculus G., *Palmicultor palmarum* (Eh.) (Pseudococcidae : Hemiptera)

Management

Slug Caterpillar, *Latoia lepida* Cram (Cochliidiidae: Lepidoptera)

Slug Caterpillar, *Contheyla rotunda* H.,

(Cochliidiidae: Lepidoptera)

Slug Caterpillar, *Macroleptra nararia* M.

(Cochliidiidae: Lepidoptera)

Management

White Leaf Roller, *Gangara thyrasis* M.

(Hesperiidae: Lepidoptera)

Green Leaf Roller, *Suastus gremius* F.

(Hesperiidae: Lepidoptera)

Long Green Caterpillar, *Turnaca acuta* W.

(Notodontidae: Lepidoptera)

Bag Worm, *Manatha albipes* M.

(Psychidae: Lepidoptera)

Management

Nut Borer, *Cyclodes omma* V.H.

(Noctuidae: Lepidoptera)

Lesser Coconut Spike Moth, *Batrachedra*

arenosella Wlk. (Cosmopterygidae: Lepidoptera)

Flower Caterpillar, *Syntomis passalis* Fab. (Cosmopterygidae: Lepidoptera)

Ash Weevil, *Myloccerus curvicornis* Fab.

(Curculionidae: Coleoptera)

Stem and Bark Weevil, *Diocalandra*

stigmaticollis G. (Curculionidae: Coleoptera)

Management

Shot Hole Borer, *Xyleborus perforans* W.

(Scolytidae: Coleoptera)

Management

Coreid Bug, *Paradasynus rostratus* Dist.

(Coreidae: Heteroptera)

Management

Root Grub, *Leucopholis coneophora* Burm. (Melolonthidae: Coleoptera)

Management

Ant, *Dorylus orientalis* W.

(Formicidae: Hymenoptera)

Red Ant, *Oecophylla smaragdina* F.

(Formicidae: Hymenoptera)

Non Insect Pests

Mites

Management

Package of Recommendations

Management

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The Burrowing Nematode,

Radopholus Similis

Management

The Coconut Nematode,

Rhadinaphelenchus Cocophilus

Rodent Pests

Management

Management

Squirrel, *Funambulus Palmarum*

Monkeys

Storage Pests

Management

Diseases

Bud Rot, *Phytophthora palmivora* Butler

Management

Thanjavur Wilt, *Ganoderma lucidum* (Leyss)

Karst and *G. applanatum*

Management

Stem Bleeding. *Thielaviopsis paradoxa*

Management

Leaf Blight, *Pestalotia palmarum*

Management

Pencil Point " (Tapering Wilt)

Management

Tatipaka Disease

Management

Crown Choke Disease

Management

Button Shedding

Management

Root Wilt

Management

Leaf Rot, *Colletotrichum gloeosporioides*,

Exserohilum rostratum, *Fusarium solani*

Management

Mahali (Fruit Rot and Nut Fall),

Phytophthora palmivora

Management

Preparation Of 1% Bordeaux Mixture

Bordeaux Paste

9. INTEGRATED DISEASE MANAGEMENT

Bud Rot Causal Organism

Symptom

Control

Preparation Of 1% Bordeaux Mixture

Bordeaux Paste

Root Disease

Symptoms

Management

Leaf Rot

Causal Organisms

Symptom

Control

Stem Bleeding Disease

Causal Organism

Symptom

Control

Thanjavur Wilt/Ganoderma Disease

Causal Organism

Symptom

Management

Mahali (Fruit Rot And Nut Fall)

Causal organism

Symptom

Control

Leaf Blight Or Grey Leaf Spot

Symptom

Control

Tatipaka Disease

Symptom
Management
Crown Choke Disease
Symptom
Control

10. GARDEN MANAGEMENT

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Coconut - A Summary
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Green Manuring In Coconut Garden
Organic Recycling In Coconut
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Leguminous Green Manure Plants for
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Basin Management with Legume Cover Crops
Growing of Gliricidia as green leaf manure crop
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Recycling of organic wastes from coconut palm
Direct utilization of coconut wastes as mulch
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Water Management
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Coconut Based Mixed Farming System
Coconut Based Sericulture System
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Cultivation

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Post Harvest Processing
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Copra Processing
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Indirect Drying
Small Holderâ€™s Copra Dryer
Smoke Free Copra Dryer For
Medium Holdings
Large Holderâ€™s Copra Dryer
Electrical Copra Dryer
Ball Copra
Copra Grading
Copra Moisture Meter
Coconut Products And Byproducts
Desiccated Coconut
Tender Coconut Water
Snow Ball Tender Nut (Sbtn)
Matured Coconut Water
Nata-De-Coco
Coconut Milk And Milk Products
Coconut Cream
Coconut Spray Dried Milk Powder
Toddy
Coconut Byproducts
Byproducts From Husk
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Coir Pith

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Extraction Of Coconut Oil

Coconut Oil Based Oleochemicals

Coconut oil based Oleochemicals:

Coconut Oil Cake

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Processing Of Desiccated Coconut

Plant & Machinery For Desiccated
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The Pilot Plant

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Quality Of Desiccated Coconut

Conclusions

17. QUALITY STATUS OF DESICCATED COCONUT

Abstract

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Results And Discussion

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Productivity

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And Technological Innovations

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Indirect hot air drier

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- Coir and Coir Products
- Emerging Technologies In The Processing Sector
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- Coconut Cream
- Coconut Milk Based Consumer Products
- Coconut Shell Based Products
- Coconut Shell Charcoal
- Activated Carbon
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- Miscellaneous Uses of Shells
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Coconut Cake
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Shell Charcoal
Coconut Shell and Wood Handicrafts
Activated Carbon from Coconut Shells
Protection against Toxic Gases
Purification of Various Gases
Recovery of Solvents and Other Vapours
Typical Plants Where Such Solvents are Recovered
Separation of Hydrocarbon Mixtures
Purification of Fermentation Carbondioxide
Recovery of Gold
Carbon Batteries
As Catalyst and Catalyst Carriers
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Mature Coconut Water Products
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Coconut Vinegar
Nata-De-Coco
Other Products

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