

Checklist of Commercial Varieties of PLANTATION CROPS



Government of India
Ministry of Agriculture
Department of Agriculture and Cooperation



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**Government of India
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Government of India
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FOREWORD

Plantation crops play an important role in securing food and nutritional security. These crops also exert a positive impact on employment generation and poverty alleviation, particularly in rural areas. India is a major producer of plantation crops but our productivity levels are abysmally low. The establishment of plantations with planting material of inferior quality leads to permanent loss in production and productivity. Plantation crops of perennial nature should, therefore, necessarily be grown of high yielding varieties. Several hybrids and improved varieties of plantation crops have been developed and are being promoted through National Horticulture Mission, Horticulture Mission for North East and Himalayan States and Rashtriya Krishi Vikas Yojana. However, we have yet to go a long way before an acceptable level of quality production and productivity of plantation crops through introduction of improved high yielding varieties is reached.

In this backdrop, the "**Checklist of Commercial Varieties of Plantation Crops**" containing salient features, recommended areas, major production belts, ecological requirements, etc., of plantation crops that has been brought out by Horticulture Division will serve as an extremely useful guide for farmers, extension functionaries and all other stakeholders. I hope this publication will have a positive impact on production and productivity of various plantation crops. I compliment Dr. Gorakh Singh, Horticulture Commissioner, Mr. Sushil Kumar Singla, Director (Horticulture) and Mr. L. Shivarama Reddy, OSD (Horticulture) for this endeavour.

Date: January 9, 2013

(Ashish Bahuguna)

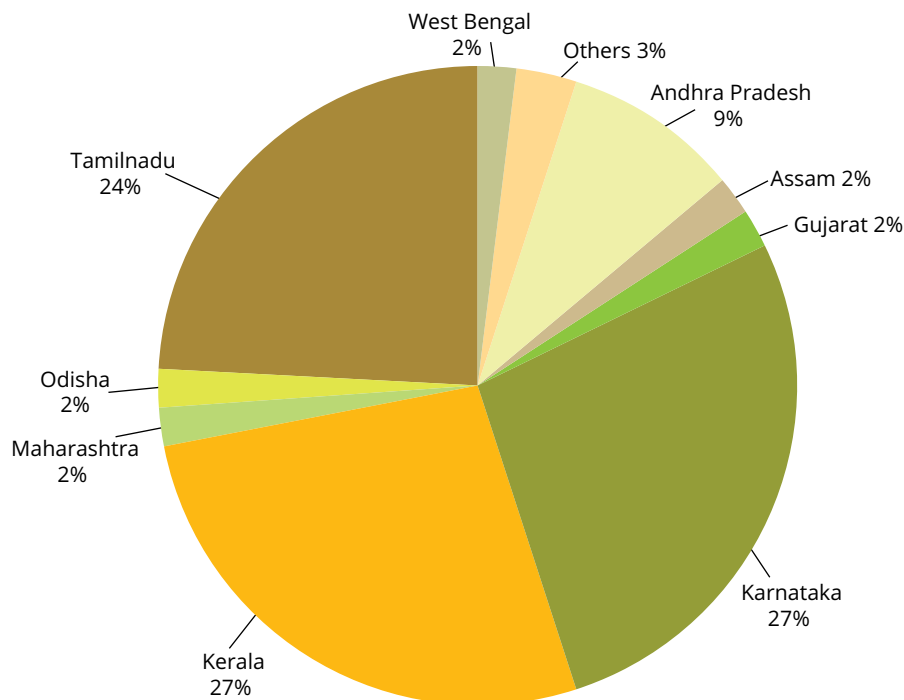




PLANTATION CROPS

The term plantation crops refers to those crops which are cultivated on an extensive scale in contiguous area, owned and managed by an individual or a company. The crops include tea, coffee, rubber, cocoa, coconut, arecanut, oil palm, palmyrah and cashew. These are high value commercial crops of greater economic importance and play a vital role in improving Indian economy, especially in view of their export potential, employment generation and poverty alleviation particularly in rural sector. Coconut, cashewnut, cocoa, arecanut, oil palm and palmyrah comes under Ministry of Agriculture while tea, coffee and rubber are dealt by Ministry of Commerce. The plantation crops covered in this checklist are arecanut, cashewnut, cocoa and coconut.

Leading Plantation Crops Producing States



ARECANUT

Arecanut or betelnut is an important cash crop in the Western Ghats, East Coast and North Eastern regions of India. Areca plant is a tall stemmed erect palm, reaching varied heights, depending upon the environmental conditions. Arecanut is an important component of the religious, social and cultural celebrations and economic life of people in India. Arecanut is also used in ayurvedic and veterinary medicines. The habit of chewing arecanut is typical of the Indian subcontinent and its neighbourhood. Although production of arecanut is localized in a few states, the commercial product is widely distributed all over the country. India is the largest producer and consumer of arecanut in the world. Karnataka is major arecanut growing state followed by Kerala and Assam. It is grown on a limited scale in Tamil Nadu, Meghalaya, West Bengal, Maharashtra and Goa.



CASHEWNUT

Cashew has assumed an important place in the Indian economy. Cashew cultivation is confined mainly to the peninsular India. Major cashew producing states are Karnataka, Kerala, Maharashtra along the West Coast and Odisha, Andhra Pradesh and Tamil Nadu along the East Coast. It is also grown to a limited extent in Goa, Andaman & Nicobar Islands, Madhya Pradesh, Manipur, Meghalaya, Assam and Tripura. The area, production and productivity of cashew have been increasing as a result of identification of superior clones, standardization of vegetative propagation techniques and near self sufficiency in quality planting material.



COCOA

Cocoa, though introduced in India in the early half of the last century, gained commercial cultivation only in 1970. Cocoa is grown as a companion crop in irrigated coconut and arecanut gardens in Kerala and Karnataka. Cocoa is being grown in some pockets of Tamil Nadu and Andhra Pradesh also.



COCONUT

The coconut palm is one of the most beautiful and useful trees in the world, grown in more than 90 countries of the tropical. It provides food, drink and shelter and also provides raw material to number of industries intimately connected with domestic as well as economic life. All the plant parts of this wonder palm are useful to mankind in one way or other. On account of this, the palm has been regarded as Kalpvriksh (Tree of heaven). In India, coconut is grown mainly along the coastal regions. Kerala, Tamil Nadu, Karnataka and Andhra Pradesh, Odisha, Maharashtra, Goa, Assam, Puducherry, Lakshadweep and Andaman & Nicobar Islands are major coconut growing states. Gujarat, Madhya Pradesh, Bihar and North Eastern region have also gained momentum in its cultivation.







COMMERCIAL VARIETIES OF PLANTATION CROPS

ARECANUT



Name of Variety	Salient Features	Recommended States
Mangala	It is high yielding semi tall palm with partially drooping crown, earliness in bearing, more number of female flowers/inflorescence, higher nut set, quicker stabilisation, round and medium sized yellow coloured nuts. The average yield 41q/ha (dry kernel).	Karnataka, Kerala, Assam, Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry, Goa and Andaman & Nicobar Islands
Sumangala	It is high yielding tall palm with partially drooping crown, oval to round shaped deep yellow coloured nuts. High recovery of chali (26.50%) from fresh fruits. The average yield 45 q/ha (dry kernel).	Kerala, Karnataka, Assam, Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry, Goa and Andaman & Nicobar Islands
Sreemangala	It is high yielding tall palm with sturdy stem, partially drooping crown, round and bold with deep yellow coloured nuts. The average yield 44 q/ha (dry kernel).	Kerala, Karnataka, Assam, Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry, Goa and Andaman & Nicobar Islands
Mohitnagar	It is high yielding tall palm with medium thick stem, partially drooping crown, orange yellow coloured oval to round shaped nuts. Higher level of uniformity in performance. The bunches are well placed and nuts loosely arranged on spikes which help in uniform development. The average yield 50 q/ha (dry kernel).	West Bengal, Karnataka, Kerala, Assam, Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry and Andaman & Nicobar Islands
Swarnamangala	It is high yielding tall palm with medium thick stem and comparatively shorter internodes, partially drooping crown. Nuts are bold and heavier with high recovery of chali (26.40 %). The average yield 53 q/ha (dry kernel).	Karnataka, Kerala, Meghalaya, Odisha, Maharashtra, Andhra Pradesh, Tamil Nadu, Tripura, West Bengal, Puducherry and Andaman & Nicobar Islands

Name of Variety	Salient Features	Recommended States
Kahikuchi	It is a tall cultivar with medium thick stem possessing comparatively shorter internodes. Nuts are bigger and heavier with high recovery of chali/ dry kernel (25.16%) from fresh fruits. The average yield 51 q/ha (dry kernel).	Assam and Meghalaya
VTLAH-1	It is a hybrid variety (Hirehalli dwarf x Sumangala). It is dwarf in nature. Sturdy stem with super imposed nodes, reduced canopy size, well spread leaves, medium sized oval to round shaped nuts and early stabilization and medium yielder. The main advantages of the hybrid variety is reduced cost of cultivation in terms of harvesting and spraying. The average yield 35 q/ha (dry kernel).	Kerala, Karnataka Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry, Goa and Andaman & Nicobar Islands
VTLAH-2	It is a hybrid variety (Hirehalli dwarf x Mohitnagar). It is dwarf in nature. Sturdy stem with super imposed nodes, reduced canopy size, well spread leaves, medium sized oval to round shaped nuts and early stabilization are the salient features of this hybrid variety. It is a medium yielder. The main advantages of this hybrid variety is reduced cost of cultivation in terms of harvesting and spraying. The average yield 36 q/ha (dry kernel).	Kerala, Karnataka Meghalaya, Maharashtra, Andhra Pradesh, Odisha, Tamil Nadu, Tripura, West Bengal, Puducherry, Goa and Andaman & Nicobar Islands
Dr. Balasaheb Sawant Konkan Krishi Vidhyapeeth, Dapoli, Maharashtra		
Shreewardhane	It is a selection from Shriwardha local. The yield ranges from 7.5 to 8.0 kg/tree/year.	Maharashtra



CASHEWNUT



Name of Variety	Salient Features	Recommended States
Madakkathara-1	It is a selection of Bapatla having compact canopy. It comes to flowering during November and fruiting in January-March. It has yellow apple with 72% juice. Average nut yield 14kg/tree having nut weight of 6.2 g, kernel weight of 1.64 g with 26.8% shelling rate and its export grade is W280.	Kerala
Madakkathara-2	It is a selection of Neduvellur having open canopy. It comes to flowering during January-March and fruiting in February-May. It has red apple with 68% juice. Average nut yield 17kg/tree having nut weight of 7.25 g kernel weight of 2.87 g with 26% shelling rate and its export grade is W210.	Kerala
Kanaka	It is a hybrid (BLA-139-1×h3-13) having open canopy. It comes to flowering during November- December and fruiting in December-March. It has yellow apple with 70% juice. Average nut yield 13kg/tree having nut weight of 6.8 g, kernel weight of 2.08 g with 30.58% shelling rate and its export grade is W280.	Kerala
Dhana	It is a hybrid (ALGD-1×K-30-1) having compact canopy. It comes to flowering during December-January and fruiting in January-March. It has yellow Apple with 72% juice. Average nut yield 11kg/tree having nut weight of 8.2 g, kernel weight of 2.44 g with 29.8% shelling rate and its export grade is W210.	Kerala, Odisha, Karnataka and Assam
Amrutha	It is a hybrid (BLA-139-1 x H-3-13) having spreading canopy. It comes to flowering during December-January and fruiting in January-March. It has yellow apple with 72% juice. Average nut yield 18kg/ tree having nut weight of 7.18 g, kernel weight of 2.24 g with 31.58% shelling rate and its export grade is W210.	Kerala
Priyanka	It is a hybrid (BLA-139-1 x H-30-1) having open canopy. It comes to flowering during December-January and fruiting in February-May. It has yellow red apple with 67% juice. Average nut yield 17kg/ tree having nut weight of 7.40 g kernel weight of 2.87 g with 26.57% shelling rate and its export grade is W180.	Kerala

Name of Variety	Salient Features	Recommended States
K-22-1	It is a selection of Kottarakkara 22 having compact canopy. It comes to flowering during December-February and fruiting in February-March. It has red apple with 67.5% juice. Average nut yield 13kg/tree having nut weight of 6.2 g kernel weight of 1.6 g with 26.5% shelling rate and its export grade is W280.	Kerala
Vengurla-4	It is a hybrid of Midnapur red x Vetore-56 having open canopy. It comes to flowering during November-December and fruiting in February-May. It has red apple with 76% juice. Average nut yield 17kg/tree having nut weight of 7.7 g kernel weight of 1.91 g with 31% shelling rate and its export grade is W210.	Maharashtra, Andhra Pradesh, Karnataka, Goa, Odisha, Gujarat, Jharkhand, Assam, Chhattisgarh, Meghalaya, Tripura, Andaman & Nicobar Islands, Puducherry and West Bengal
Vengurla-6	It is a hybrid of Vetore-56 x Ansur-1 having compact canopy. It comes to flowering during November-December and fruiting in February-May. It has yellow apple with 85% juice. Average nut yield 14kg/tree having nut weight of 8 g kernel weight of 1.91 g with 28% shelling rate and its export grade is W210.	Maharashtra
Vengurla-7	It is a hybrid of Vengurla-3 x M-10/4(Vri-1) having compact canopy. It comes to flowering during November-December and fruiting in March-May. It has yellow apple with 86% juice. Average nut yield 18kg/tree having nut weight of 10 g Kernel weight of 2.9 g with 30.5% shelling rate and its export grade is W180.	Maharashtra, Karnataka, Goa, Assam, Meghalaya, Tripura, Gujarat, Andaman & Nicobar Islands and Puducherry
BPP-4	It is a selection of Epurupalem having open canopy. It comes to flowering during February-April and fruiting in April-May. It has yellow apple with 64% juice. Average nut yield 10kg/tree having nut weight of 6 g kernel weight of 1.15 g with 32.3% shelling rate and its export grade is W400.	Andhra Pradesh
BPP-6	Trees having open/spreading canopy. It comes to flowering during February-May and fruiting in April-June. It has yellow apple with 74% juice. Average nut yield 10kg/tree having nut weight of 5.2 g, kernel weight of 1.44 g with 24% shelling rate and its export grade is W400.	Andhra Pradesh
BPP-8 (H2/16)	It is a hybrid (T1 x T3) having compact canopy. It comes to flowering during February-April and fruiting in April-May. It has yellow apple with 64% juice. Average nut yield 14kg/tree having nut weight of 8.2 g, kernel weight of 1.89 g with 29% shelling rate and its export grade is W210.	Andhra Pradesh, West Bengal, Odisha, Jharkhand and Chhattisgarh
Vridhachalam-3 (M 26/2)	It is a selection of Edayanchavadi having compact canopy. It comes to flowering during January-February and fruiting in February-May. It has red Apple with 72.8% juice. Average nut yield 12kg/tree having Nut weight of 7.18 g, Kernel weight of 2.16 g with 29.1% Shelling rate and its Export grade is W210.	Tamil Nadu, Kerala, Goa, Andaman & Nicobar Islands and Puducherry



Name of Variety	Salient Features	Recommended States
Ullal-1	It is a selection of Thaliparamba having medium spreading canopy. It comes to flowering during November-April and fruiting in February-May. It has yellow apple with 64.2% juice. Average nut yield 16kg/tree having nut weight of 6.7 g, kernel weight of 2.05 g with 30.7% shelling rate and its export grade is W210.	Karnataka
Ullal-2	It is a selection of 3/67 Guntur having medium spreading canopy. It comes to flowering during December-March and fruiting in February-April. It has red apple with 64.1% juice. Average nut yield 9kg/tree having nut weight of 6 g, kernel weight of 1.83 g with 30.5% shelling rate and its export grade is W320.	Karnataka and Assam
Ullal-3	It is a selection of 5/37 Manchery having open canopy. It comes to flowering during November-January and fruiting in January-March. It has dark red apple with 66.1% juice. Average nut yield 15kg/tree having nut weight of 7 g, kernel weight of 2.1 g with 30% shelling rate and its export grade is W210.	Karnataka, Assam, Meghalaya and Tripura
Ullal-4	It is a selection of 2/77 Tuni having open canopy. It comes to flowering during November-January and fruiting in January-March. It has yellow apple with 65.4% juice. Average nut yield 9kg/tree having nut weight of 7.2 g, kernel weight of 2.15 g with 31% shelling rate and its export grade is W210.	Karnataka, Assam, Meghalaya and Tripura
Chintamani-1	It is a selection of 8/46 Thaliparamba having open canopy. It comes to flowering during January-April and fruiting in February. It has yellowish red apple with 65.4% juice. Average nut yield 7kg/tree having nut weight of 6.9 g, kernel weight of 2.1 g with 31% shelling rate and its export grade is W210.	Karnataka
UN-50	It is a selection of 2/27 Nileswar having medium canopy. It comes to flowering during November-January and fruiting in February -May. It has yellow apple with 65.2% juice. Average nut yield 10kg/tree having nut weight of 9 g, kernel weight of 2.24 g with 32.8% shelling rate and its export grade is W180.	Karnataka
NRCC-2	It is a selection of 2/9 Dicherla having medium compact canopy. It comes to flowering during November-January and fruiting in February-March. It has pink apple. Average nut yield 9kg/tree having nut weight of 9.2 g, kernel weight of 2.15 g with 28.6% shelling rate and its export grade is W210.	Karnataka

Name of Variety	Salient Features	Recommended States
Jhargram-1	It is a selection of T.No 16 of Bapatla having medium compact canopy. It comes to flowering during February-April and fruiting in April-May. It has yellow apple with 63.5% juice. Average nut yield 8kg/tree having nut weight of 5 g, kernel weight of 1.5 g with 30% shelling rate and its export grade is W320.	West Bengal and Odisha
Bhubaneswar-1	It is a selection of WBDC-5 (V36/3) having medium compact canopy. It comes to flowering during January-March and fruiting in March-May. It has reddish yellow apple. Average nut yield 10kg/tree having nut weight of 4.6 g, kernel weight of 1.47 g with 32% shelling rate and its export grade is W320.	Odisha
Goa-1	It is a selection of Balli-2 having semi spreading compact canopy. It comes to flowering during December-February and fruiting in March-May. It has yellow apple with 68% juice. Average nut yield 7kg/tree having nut weight of 7.6 g, kernel weight of 2.2 g with 30% shelling rate and its export grade is W210.	Goa



COCOA



Name of Variety	Salient Features	Recommended States
VTLCC-1	It is a clonal selection. It is an early, heavy bearer, and also self and cross compatible. The colour of the pod is green to yellow. Fat content 52.5% and shelling 12%.9. The average yield 11 q/ha (dry beans).	Karnataka, Kerala and Tamil Nadu
VTLCH-1	It is a hybrid variety. It is early, heavy bearer, tolerant to water stress. The colour of the pod is red to pink. The average yield 9 q/ha (dry beans).	Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Goa, Meghalaya, Puducherry, Andaman & Nicobar Islands, Assam, West Bengal and Odisha
VTLCH-2	It is a hybrid variety. It is early, heavy bearer, black pod disease tolerant. The colour of the pod is yellow. The average yield 8 q/ha (dry beans).	Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Meghalaya, Goa, Puducherry, Andaman & Nicobar Islands, Assam, West Bengal and Odisha
VTLCH-3	It is a hybrid variety. It is early, heavy bearer, drought tolerant. The colour of the pod is yellow. The average yield 10 q/ha (dry beans).	Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Goa, Meghalaya, Puducherry, Andaman & Nicobar Islands, Assam and West Bengal
VTLCH-4	It is a hybrid variety. It is early, heavy bearer, drought tolerant. The colour of the pod is yellow. The average yield 9 q/ha (dry beans).	Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Meghalaya, Puducherry, Andaman & Nicobar Islands, Assam, West Bengal and Goa
CCRP-1	It is a clonal selection. The pods are medium sized and green in color, which turn to yellow on ripening. The average yield 10 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh
CCRP-2	It is a clonal selection. The trees are high yielding medium sized smooth green pods turning yellow on ripening. The average yield 9 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh

Name of Variety	Salient Features	Recommended States
CCRP-3	It is a selection from open pollinated seedlings of T76/1224/1201. Pods are medium sized and smooth turning yellow on ripening. The average yield 10 q/ha (dry beans).	Kerala and Karnataka
CCRP-4	It is a clonal selection. Pods are large with purple tinged turning deep yellow on ripening. The average yield 12 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh
CCRP-5	It is a clonal selection. Pods are large and elliptical and green when immature. They turn yellow on ripening. The average yield 6 q/ha (dry beans).	Kerala
CCRP-6	It is a clonal selection. Pods are very big and green in colour having thick rind and they turns yellow on ripening. The average yield 15 q/ha (dry beans).	Kerala
CCRP-7	It is a clonal selection. Pods are large, elongated and green and turning to yellow on ripening. The average yield 15 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh
CCRP-8	It is a hybrid between CCRP-1 and CCRP-7. It is high yielding, producing medium sized smooth green pods turning yellow on ripening. The average yield 18 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh
CCRP-9	It is a hybrid between CCRP-3 and CCRP-4. It produces medium sized smooth green pods turning yellow on ripening. The average yield 15 q/ha (dry beans).	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh
CCRP-10	It is a hybrid between CCRP-3 and GVI 68. It is high yielding, producing medium sized smooth green pods turning yellow on ripening. The average yield 16 q/ha (dry beans.)	Kerala, Karnataka, Tamil Nadu and Andhra Pradesh



COCONUT



Name of Variety	Salient Features	Recommended States
West Coast Tall	It is a tall variety suitable for production of copra and tender nut. It comes to bearing in 5-7 years after planting. The palms are tall, robust and bear large green nuts but has wide range of variation in size, shape and colour of nuts. The average yield 15000 nuts/ha, copra yield 36 q/ha and oil 25 q/ha.	Kerala, Karnataka, Maharashtra, Goa, Tamil Nadu, Andhra Pradesh, Bihar, Andaman & Nicobar Islands, Gujarat, Lakshadweep and Puducherry
East Coast Tall	It is a tall variety suitable for production of copra and tender nut. The palms are tall, compact and bear medium sized oval shaped green nuts. The average yield 14500 nuts/ha, copra yield 34 q /ha and oil 22 q/ha.	Odisha, Assam, West Bengal, Bihar, Andhra Pradesh, Meghalaya and Tripura
Tiptur Tall	It is a tall variety suitable for production of copra and tender nut. It comes to bearing in 5-7 years after planting. The palms are tall, robust. The average yield 15050 nuts/ha, copra yield 37 q/ha and oil 26 q/ha.	Karnataka
Andaman Ordinary	It is a tall variety suitable for production of copra and tender nut. It comes to bearing in 5-7 years after planting. The palms are tall, robust and bear large green nuts but has wide range of variation in size, shape and colour of nuts. The average yield 16450 nuts/ha, copra yield 36 q/ha and oil 24 q/ha.	Kerala and Andaman & Nicobar Islands
Gangabondam	It is a semi tall variety suitable for tender nut. It comes to bearing in 5-7 years after planting. The palms are tall, robust and bear large green nuts. The average yield 16000 nuts/ha.	Andhra Pradesh
Chowghat Green Dwarf	It is an early bearing cultivar and takes about 3-4 years for initial flowering. The average yield 14000 nuts/ha.	Kerala, Karnataka, Andhra Pradesh, Tamil Nadu, Odisha, Andaman & Nicobar Islands, West Bengal, Goa, Gujarat, Assam, Bihar and Maharashtra
Malayan Orange Dwarf	It is suitable for tender nut. This is an early flowering cultivar and takes about 3-4 years for initial flowering. It gives 400 ml of tender nut water/nut. The average yield 16000 nuts/ha.	Kerala, Karnataka, Andhra Pradesh, Tamil Nadu, Odisha, Andaman & Nicobar Islands and West Bengal

Name of Variety	Salient Features	Recommended States
Malayan Green Dwarf	This is an early flowering cultivar and takes about 3-4 years for initial flowering. It gives 370 ml of tender nut water/nut. The average yield 16250 nuts/ha.	Kerala, Karnataka, Andhra Pradesh, Tamil Nadu, Odisha and West Bengal
Central Plantation Crops Research Institute, Kasaragod, Kerala		
Kalpa Pratibha	It is suitable for tender nut and copra. The variety is a regular bearer, relatively tolerant to drought. The nuts are large, round in shape and predominantly green in colour. The quality of tender nut water is good with 5.5 g total sugars/100ml, 1.1 mg free amino acids/100 ml, 2150 ppm potassium and 21.7 ppm sodium. The quantity of tender nut water is 448 ml/nut. The average yield 15874 nuts/ha, copra yield 41 q/ha and oil 27 q/ha.	Kerala, Karnataka, Maharashtra and Tamil Nadu
Kalpa Dhenu	It is a regular bearer, relatively tolerant to drought. The palms are tall, robust and bear large, green nuts. The tender nut water of this variety contains 4.92g total sugars/100 ml, 1.3 mg free amino acids/100 ml, 2650 ppm potassium and 24.6 ppm sodium. It commences flowering in 67 months after planting. The quantity of tender nut water is 290 ml/nut. The average yield 15012 nuts/ha, copra yield 37 q/ha and oil 24 q/ha.	Kerala, Karnataka, Maharashtra, Tamil Nadu and Andaman & Nicobar Islands
Kalpa Mitra	It is a regular bearer, relatively tolerant to drought and produces large, yellowish green, oval shaped nuts. The variety is suited for west coast region of the country and West Bengal. Suitable for ball copra. The tender nut water of this variety contains 5.7g total sugars/100 ml, 1.3 mg free amino acids/100 ml, 2150 ppm potassium and 23.5 ppm sodium. The quantity of tender nut water is 495 ml. The average yield 13973 nuts/ha, copra yield 34 q/ha and oil 22 q/ha.	Kerala, Karnataka, Maharashtra, Tamil Nadu and West Bengal
Kalparaksha	A high yielding coconut variety with field resistance to coconut root (wilt) disease. This is a semi tall variety with sweet tender nut water. It comes to flowering by 54 months from planting. The quantity of tender nut water is 290 ml. The average yield 15225 nuts/ha, copra yield 33 q/ha and oil 21q/ha.	Kerala
Kalpa Samrudhi	It is a superior hybrid (MYD x WCT). This hybrid has good tender nut water quality with TSS 6° Brix and quantity (346 ml/ nut) and has been found to be relatively drought tolerant compared to other released hybrids. The average yield 20475 nuts/ha, copra yield 45 q/ha and oil 30 q/ha under rainfed condition.	Kerala and Assam



Name of Variety	Salient Features	Recommended States
Kalpa Sankara	This coconut hybrid (CGD x WCT) has tolerance to root (wilt) disease. The palms are semi tall in nature, precocious bearing and relatively higher yield in root (wilt) diseased tracts. The average yield 14700 nuts/ha, copra yield 25 q/ha and oil 17 q/ha.	Kerala
Kalpasree	It is mainly for tender nut. This variety was developed by selection from Chowghat Green Dwarf population in the root (wilt) disease hotspot regions of Kerala. It gives superior quality coconut oil, sweet tender nut water (240 ml per nut) and sweet meat (kernel). The tender water contains total sugars 4.80 g/ml, potassium 150 ppm, sodium 22.40 ppm with a TSS of 4.80 Brix. The average yield 15750 nuts/ha, copra yield 15 q/ha and oil 17 q/ha.	Kerala
Kalpatharu	It is a selection from Tiptur Tall accession, suitable for ball copra production. The average yield 20300 nuts/ha, copra yield 35 q/ha and oil 25 q/ha.	Karnataka, Kerala and Tamil Nadu
Chandra Kalpa	It is relatively drought tolerant compared to the other varieties and hybrids. The palm grows in all types of soil and can withstand moisture stress. The average yield 16975 nuts/ha, copra yield 33 q/ha and oil 23 q/ha.	Tamil Nadu, Andhra Pradesh, Maharashtra, Kerala and Karnataka
Kera Chandra	A high yielding variety. This variety gives an estimated yield of 3.81 tons copra/ha, 2.52 tons oil/ha. The average yield 19250 nuts/ha, copra yield 38 q/ha and oil 25 q/ha.	Kerala, Karnataka, Maharashtra, Andhra Pradesh and West Bengal
Chowghat Orange Dwarf	It is a best cultivar for use as tender nut. This is an early flowering cultivar and takes about 3-4 years for initial flowering. It gives 350 ml of tender nut water/ nut. The average yield 14525 nuts/ha.	Kerala, Karnataka, Andhra Pradesh, Tamil Nadu, Odisha, Andaman & Nicobar Islands, West Bengal, Goa, Gujarat, Assam, Bihar and Maharashtra
Kera Sankara	The palm comes to bearing by the fourth year of planting. This is a TxD hybrid (WCT x COD). The average yield 18550 nuts/ha, copra yield 37 q/ha and oil 25 tons/ha.	Kerala, Andhra Pradesh, Maharashtra and Karnataka
Chandra Sankara	The average yield 19250 nuts/ha, copra yield 40 q/ha and oil 27 q/ha.	Kerala, Karnataka and Tamil Nadu
Chandra Laksha	It is a hybrid (LCT x COD) comes to bearing in about 4-5 years after planting. The average yield 19075 nuts/ha, copra yield 37 q/ha and oil 26 q/ha.	Kerala, Lakshadweep and Karnataka
Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu		
VPM-3	This is a selection from Andaman Ordinary Tall. The average yield 92 nuts/tree. Average weight of nut 176 g having 70% oil content.	Tamil Nadu
ALR(CN)-1	This is a selection from Arasampatti Tall. The average yield 125 nuts/tree. The yield of copra 131 g/nut having 66.5% oil content.	Tamil Nadu



Name of Variety	Salient Features	Recommended States
VHC1	This is a hybrid of East Coast Tall × Malayan Green Dwarf. The average yield 115 nuts/tree. The yield of copra 142 g/nut having 69% oil content.	Tamil Nadu
VHC 2	This is a hybrid of East Coast Tall × Malayan Green Dwarf. The average yield 142 nuts/tree. The yield of copra 152 g/nut having 70% oil content.	Tamil Nadu
VHC 3	This is a hybrid of East Coast Tall × Malayan Orange Dwarf. The average yield 156 nuts/tree. The average of copra 162 g/nut having 70% oil content.	Tamil Nadu
Junagadh Agricultural University, Junagadh, Gujarat		
Kerasagara	This is a selection from Seychelles (SE Asia). The average yield 99 nuts/tree. The average yield of copra 203 g/nut having 68% oil content.	Kerala
Coconut Hybrid Mahuva	This is a hybrid of Tall X Dwarf. The average yield 43 nuts/tree.	Gujarat
Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Maharashtra		
Pratap	This is a selection from Banawali. The average yield 150 nuts/tree. The average yield of copra 152 g/nut having 59% oil content.	Maharashtra
Banawali	This is a pure line selection. The average yield 120 nuts/tree.	Maharashtra
Konkan Bhatye Coconut Hybrid-1	The average yield 122 nuts/tree. The oil content of copra 65%.	Maharashtra
Indira Gandhi Agriculture University, Raipur, Chhattisgarh		
Indira Nariyal-1	The average yield 85 nuts/tree. The copra yield 2 t/ha.	Chhattisgarh
Assam Agricultural University, Jorhat, Assam		
Kamrup	The average yield 106 nuts/tree. The average yield of copra 162 g/nut.	Assam
Kahikuchi Coconut Hybrid-1	The average yield 122 nuts/tree. The oil content of copra 65%.	Andhra Pradesh
Dr. Y.S.R. Horticultural University, Tadepalligudem, Andhra Pradesh		
Gauthami Ganga	The average yield is 90 nuts/tree. The average yield of copra 157g/nut having oil content 68%.	Chhattisgarh, Andhra Pradesh, Maharashtra and Tamil Nadu
Godavari Ganga	This is a hybrid from East Coast Tall × Gangabondam. The average yield is 140 nuts/tree. Average yield of copra 153 g/nut having oil content 67%.	Andhra Pradesh
Kera Bastar	The average yield 110 nuts/tree. The average yield of copra 180 g/nut having oil content of 68.7%.	Chhattisgarh, Andhra Pradesh, Maharashtra and Tamil Nadu
Coconut Research Station, Veppankulam, Kerala		
Kera Keralam	The average yield 147 nuts/tree. The average yield of copra 164 g/nut having oil content of 64%.	Kerala, Tamil Nadu and West Bengal
Kerala Agricultural University, Thrissur, Kerala		
Keraganga	This is a hybrid from West Coast Tall × Gangabondam. The average yield 100 nuts/tree. The yield of copra 201 g/nut having oil content of 69%.	Kerala



Name of Variety	Salient Features	Recommended States
Anandaganga	This is a hybrid between Andaman Ordinary × Gangabondam. The average yield 95 nuts/tree. The yield of copra 216 g/nut having oil content of 68%.	Kerala
Kerasree	This is a hybrid between West Coast Tall × Malayan Yellow Dwarf. The average yield 130 nuts/tree. The yield of copra 216 g/nut having oil content of 66%.	Kerala
Kerasowbhagya	This is a hybrid between West Coast Tall × SSA. The average yield 116 nuts/tree. The yield of copra 196 g/nut having oil content of 65%.	Kerala
Bidhan Chand Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal		
Kalyani Coconut-1	The average yield 180 nuts/tree. The yield of copra 154 g/nut having oil content of 66%.	West Bengal

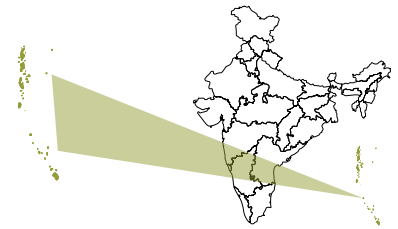






STATE WISE RECOMMENDED VARIETIES OF PLANTATION CROPS

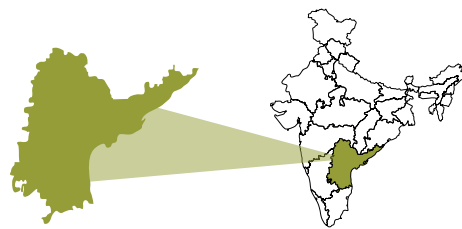
ANDAMAN & NICOBAR ISLANDS



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, Vengurla-7, Vridhachalam-3
Cocoa	VTLCH-1, VLTCH-2, VLTCH-3, VLTCH-4
Coconut	West Coast Tall, Andaman Ordinary, Kalpa Dhenu, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf



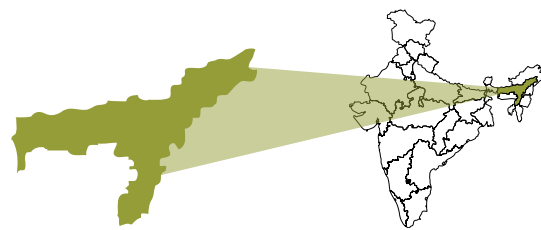
ANDHRA PRADESH



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, BPP-4, BPP-6, BPP-8
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4, CCRP-1, CCRP-2, CCRP-4, CCRP-7, CCRP-8, CCRP-9, CCRP-10
Coconut	West Coast Tall, East Coast Tall, Gangabondam, Kera Sankara, Chandra Kalpa, Kera Chandra, Kera Sankara, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf, Kahikuchi Coconut Hybrid-1, Gauthami Ganga, Godavari Ganga, Kera Bastar



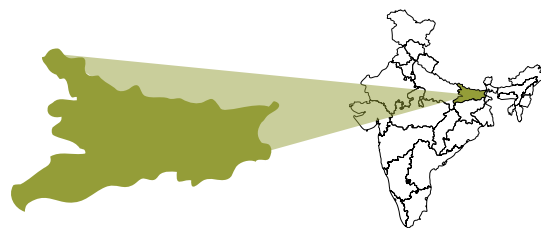
ASSAM



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Kahikuchi, Mohitnagar
Cashewnut	Vengurla-4, Ullal-2, Ullal-3, Ullal-4, Vengurla-7, Dhana
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	East Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf, Kamrup, Kalpa Samrudhi



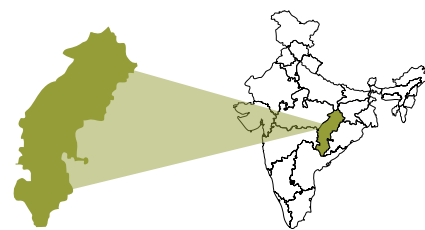
BIHAR



Crop	Varieties
Coconut	West Coast Tall, East Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf



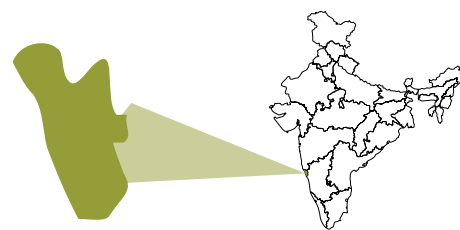
CHHATTISGARH



Crop	Varieties
Cashewnut	Vengurla-4, BPP-8
Coconut	Indira Nariyal-1, Gauthami Ganga, Kera Bastar



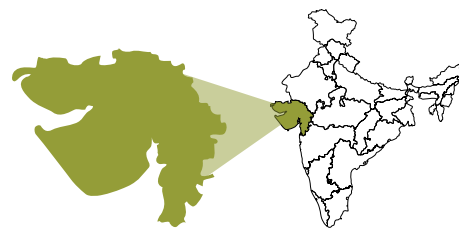
GOA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, Vengurla-7, Vridhachalam-3, Goa-1
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	West Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf



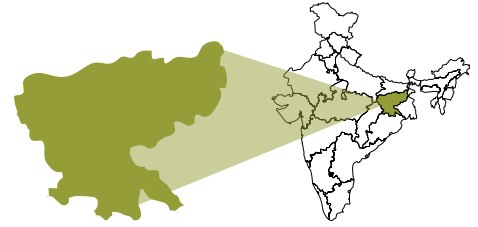
GUJARAT



Crop	Varieties
Cashewnut	Vengurla-4, Vengurla-7
Coconut	West Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf, Coconut Hybrid Mahuva



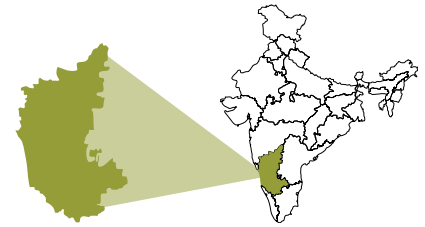
JHARKHAND



Crop	Varieties
Cashewnut	Vengurla-4, BPP-8



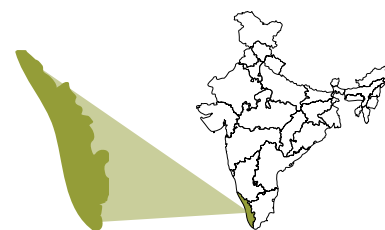
KARNATAKA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Dhana, Vengurla-4, Vengurla-7, Ullal-1, Ullal-2, Ullal-3, Ullal-4, Chintamani-1, UN-50, NRCC-2
Cocoa	VTLCC-1, VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4, CCRP-1, CCRP-2, CCRP-3, CCRP-4, CCRP-7, CCRP-8, CCRP-9, CCRP-10
Coconut	West Coast Tall, Tiptur Tall, Kalpatharu, Kalpa Pratibha, Kalpa Dhenu, Kalpa Mitra, Chandra Kalpa, Kera Chandra, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf, Kera Sankara, Chandra Sankara, Chandra Laksha



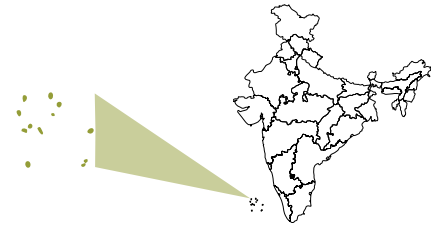
KERALA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Madakkathara-1, Kanaka, Dhana, Amrutha, Priyanka, Madakkathara-2, K-22-1, Vridhachalam-3
Cocoa	VTLCC-1, VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4, CCRP-1, CCRP-2, CCRP-3, CCRP-4, CCRP-5, CCRP-6, CCRP-7, CCRP-8, CCRP-9, CCRP-10
Coconut	West Coast Tall, Andaman Ordinary, Kalpa Pratibha, Kalpa Dhenu, Kalpa Mitra, Kalparaksha, Kalpa Samrudhi, Kalpa Sankara, Kalpasree, Kalpatharu, Chandra Kalpa, Kera Chandra, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf, Kera Sankara, Chandra Sankara, Chandra Laksha, Kerasagara, Kera Keralam, Keraganga, Anandaganga, Kerasree, Kerasowbhagya



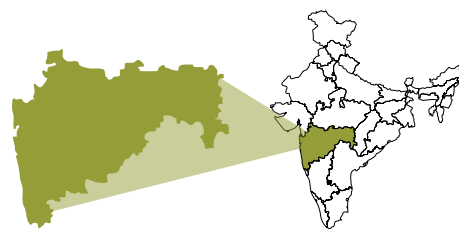
LAKSHADWEEP



Crop	Varieties
Coconut	West Coast Tall, Chandra Laksha



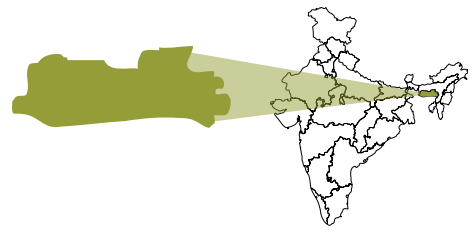
MAHARASHTRA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2, Shreewardhanee
Cashewnut	Vengurla-4, Vengurla-6, Vengurla-7
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	West Coast Tall, Kalpa Dhenu, Kalpa Mitra, Kalpa Pratibha, Chandra Kalpa, Kera Chandra, Kera Sankara, Chowghat Orange Dwarf, Chowghat Green Dwarf, Pratap, Banawali, Konkan Bhatye Coconut Hybrid-1, Gauthami Ganga, Kera Bastar



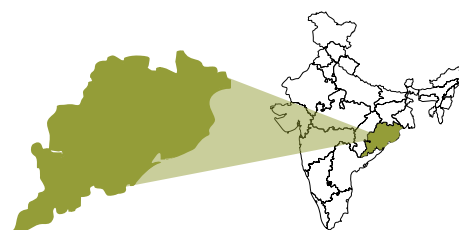
MEGHALAYA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, Kahikuchi, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, Vengurla-7, Ullal-3, Ullal-4
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	East Coast Tall



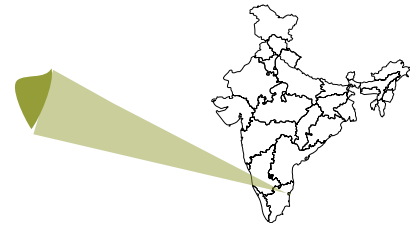
ODISHA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Dhana, Vengurla-4, BPP-8, Bhubaneshwar-1, Jhargram-1
Cocoa	VTLCH-1, VTLCH-2
Coconut	East Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf



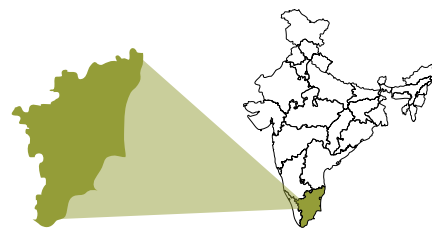
PUDUCHERRY



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, Vengurla-7, Vridhachalam-3
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	West Coast Tall



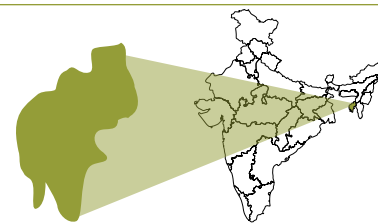
TAMIL NADU



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vridhachalam-3
Cocoa	VTLCC-1, VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4, CCRP-1, CCRP-2, CCRP-4, CCRP-7, CCRP-8, CCRP-9, CCRP-10
Coconut	West Coast Tall, Kalpa Mitra, Kalpa Pratibha, Kalpa Dhenu, Kalpatharu, Chandra Kalpa, Chowghat Orange Dwarf, Chowghat Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf, Chandra Sankara, VPM-3, ALR(CN)-1, VHC-1, VHC-2, VHC-3, Gauthami Ganga, Kera Bastar, Kera Keralam



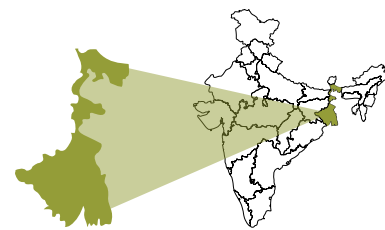
TRIPURA



Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, Vengurla-7, Ullal-3, Ullal-4
Coconut	East Coast Tall



WEST BENGAL



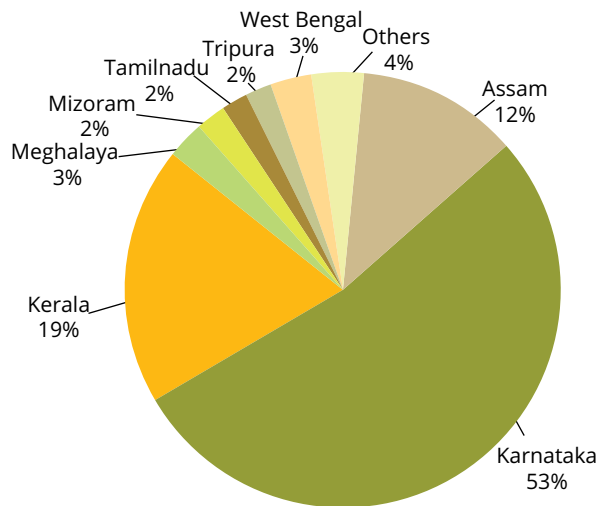
Crop	Varieties
Arecanut	Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, VTLAH-1, VTLAH-2
Cashewnut	Vengurla-4, BPP-8, Jhargram-1
Cocoa	VTLCH-1, VTLCH-2, VTLCH-3, VTLCH-4
Coconut	East Coast Tall, Kalpa Mitra, Kera Chandra, Chowghat Orange Dwarf, Chowgaht Green Dwarf, Malayan Orange Dwarf, Malayan Green Dwarf, Kalyani Coconut-1, Kera Keralam



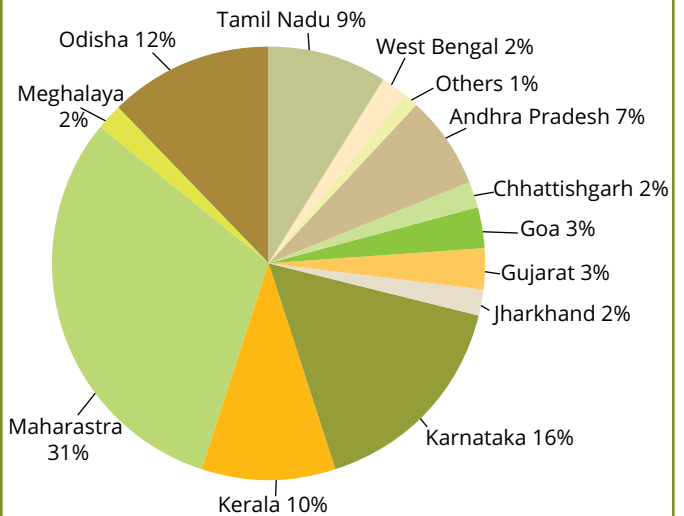


LEADING PLANTATION CROPS PRODUCING STATES (% SHARE IN PRODUCTION)

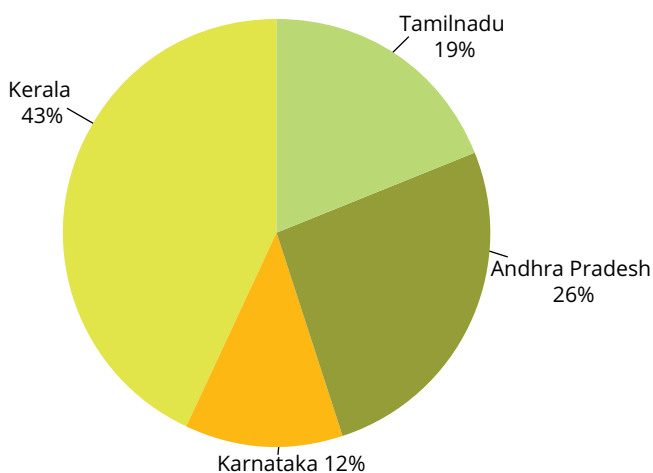
Arecanut



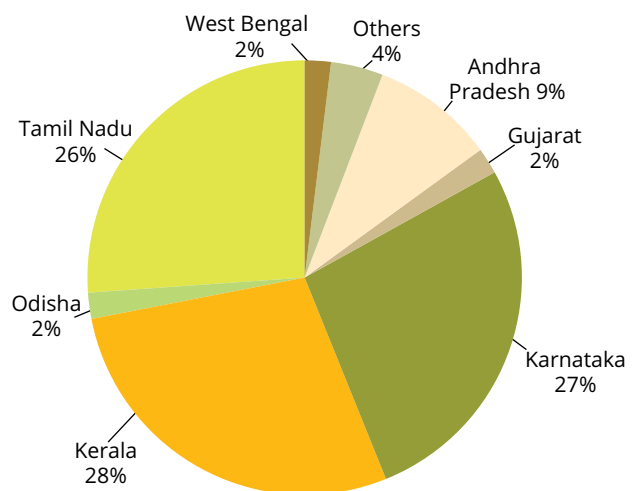
Cashewnut



Cocoa



Coconut

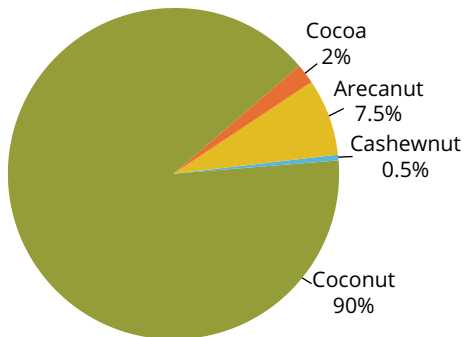




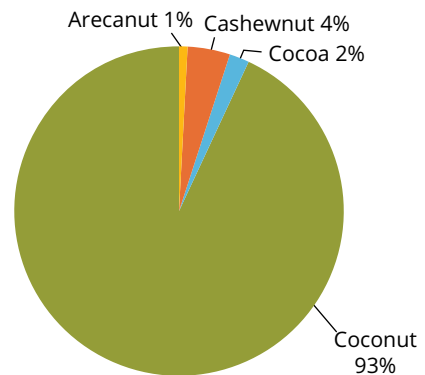
PRODUCTION SHARE OF PLANTATION CROPS IN DIFFERENT STATES OF INDIA



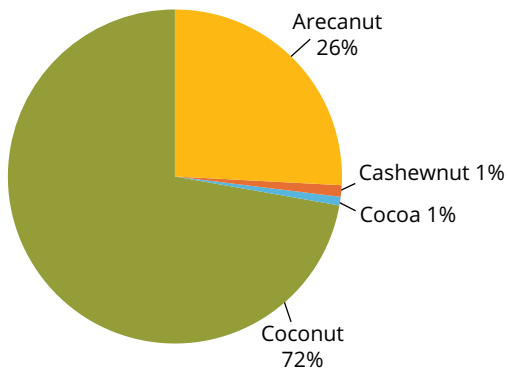
Andaman & Nicobar Islands



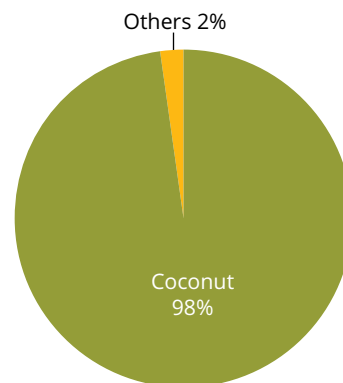
Andhra Pradesh



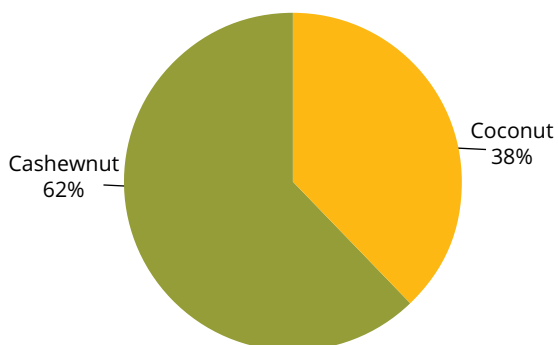
Assam



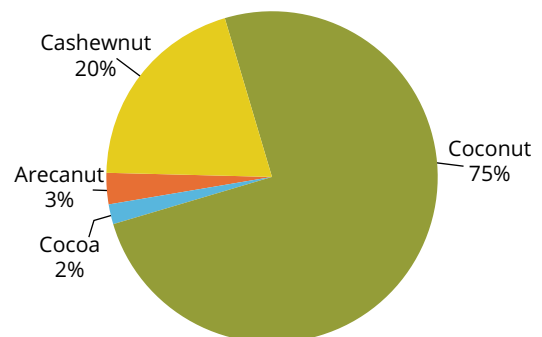
Bihar



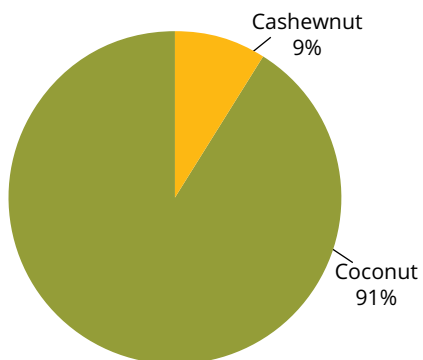
Chhattisgarh



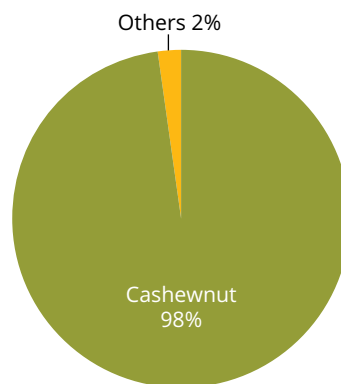
Goa



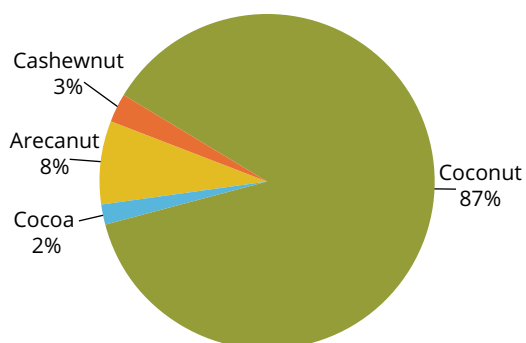
Gujarat



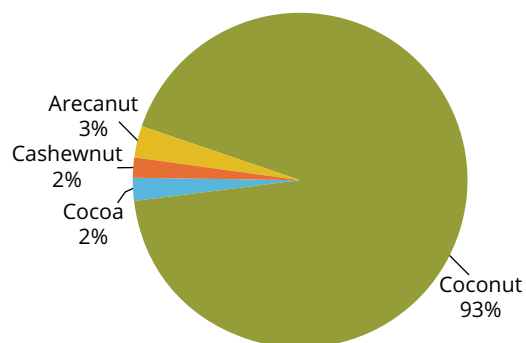
Jharkhand



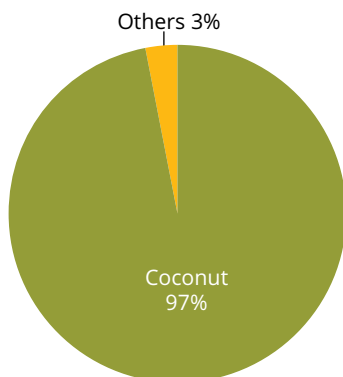
Karnataka



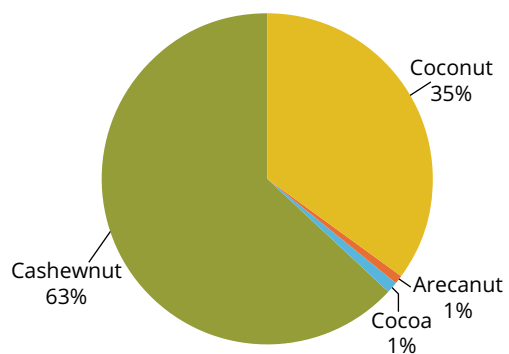
Kerala



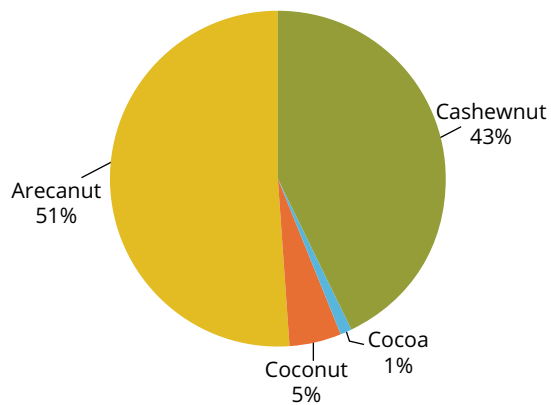
Lakshadweep



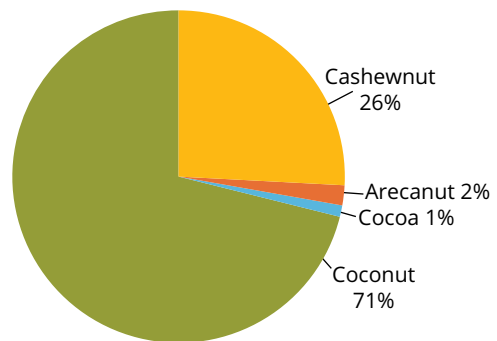
Maharashtra



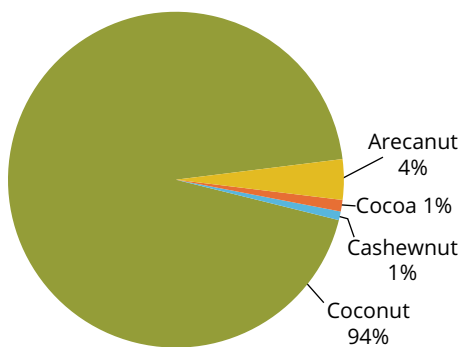
Meghalaya



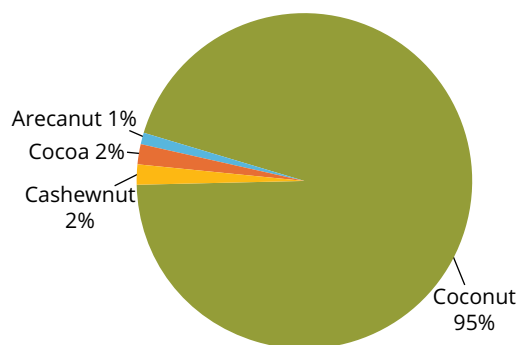
Odisha



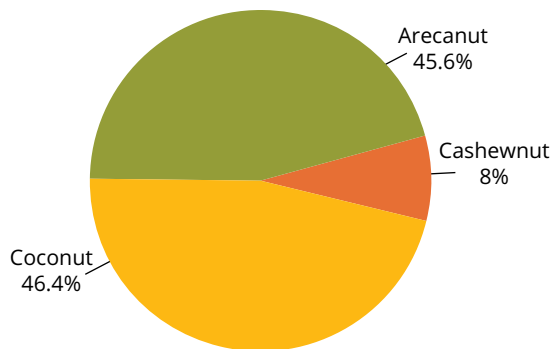
Puducherry



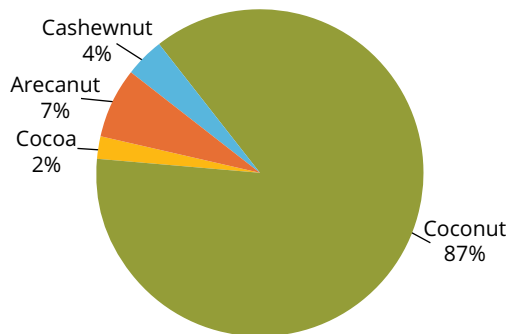
Tamil Nadu



Tripura



West Bengal







MAJOR PLANTATION CROPS PRODUCING BELTS IN INDIA

1. ARECANUT

- **Andaman & Nicobar Islands:** All parts of Andaman & Nicobar Islands
- **Andhra Pradesh:** Vizianagaram, West Godavari, Krishna, Anantapur
- **Assam:** Barpeta, Baksa, Bongaigaon, Chirang, Dibrugarh, Goalpara, Golaghat, Jorhat, Kamrup, Kokrajhar, Lakhimpur, Nagaon, Nalbari, Sonitpur, Tinsukia, Udalguri
- **Karnataka:** Tumkur, Chikmagalur, Bengaluru, Shimoga, Uttara & Dakshina Kannada, Udipi, Chitradurga, Davanagere
- **Kerala:** Kasaragod, Kannur, Malapuram, Palakkad, Kozhikode, Wayanad, Ernakulam, Thrissur
- **Maharashtra:** Ratnagiri, Sindudurg, Raigad, Thane
- **Meghalaya:** East Khasi Hills, Jaintia Hills, West Garo Hills, East Garo Hills
- **Odisha:** Balasore, Bhadrak, Cuttack, Dhenkanal, Ganjam, Jagatsinghpur, Jajapur (Jajpur), Puri
- **Puducherry:** Mahe
- **Tamil Nadu:** Salem, Coimbatore, Kanyakumari, Namakkal, Dharmapuri, Erode
- **Tripura:** Dhalai, North, South & West Districts
- **West Bengal:** Jalpaiguri, Cooch Behar, 24 Parganas (North & South), Howrah, Nadia, Darjeeling

2. CASHEWNUT

- **Andhra Pradesh:** Srikakulam, Visakhapatnam, East Godavari, West Godavari, Khammam, Vizianagaram
- **Chhattisgarh:** Bastar Region, Raigarh
- **Goa:** North and South Goa
- **Gujarat:** Valsad
- **Jharkhand:** East & West Singhbhum, Saraikela, Jamtara, Pakur, Dumka, Deoghar
- **Karnataka:** Kolar, Uttara & Dakshina Kannada, Shimoga, Bidar, Udupi, Belgaum, Chikkaballapur

- **Kerala:** Kasaragod, Kannur, Malappuram, Kozhikode, Palakkad, Thiruvananthapuram, Kollam
- **Maharashtra:** Ratnagiri, Sindhudurg, Raigad, Kolhapur, Thane
- **Meghalaya:** East Garo Hills, West Garo Hills
- **Puducherry:** Puducherry, Karaikal
- **Odisha:** Dhenkanal, Cuttack, Nayagarh, Ganjam, Kendujhar (Keonjhar), Koraput, Jajapur (Jaipur), Mayurbanj, Khurda
- **Tamil Nadu:** Cuddalore, Pudukkottai, Tiruchirappalli, Villupuram, Perambalur, Ariyalur
- **Tripura:** South Tripura
- **West Bengal:** Midnapur (East & West), Purulia

3. COCOA

- **Andaman & Nicobar Islands:** All parts of Andaman & Nicobar Islands
- **Andhra Pradesh:** East Godavari, West Godavari, Visakhapatnam, Vizianagaram, Krishna, Khammam
- **Assam:** Barpeta, Baksa, Bongaigaon, Cachar, Chirang, Darrang, Dhemaji, Dhubri, Dibrugarh, Goalpara, Golaghat, Hailakandi, Jorhat, Karbi Anglong, Kamrup, Karimganj, Kokrajhar, Lakhimpur, Marigaon, N.C. Hills, Nagaon, Nalbari, Sibsagar, Sonitpur, Tinsukia, Udalguri
- **Goa:** North & South Goa
- **Karnataka:** Uttara & Dakshina Kannada, Shimoga, Mysore, Davanagere, Kodagu, Mandya, chickmagalore, Hassan, Tumkur
- **Kerala:** Idukki, Kottayam, Malappuram, Trissur, Kozhikode, Kasaragod
- **Maharashtra:** Raigad, Ratnagiri, Sindhudurg, Thane
- **Meghalaya:** East Khasi Hills, Jaintia Hills, West Garo Hills, East Garo Hills
- **Odisha:** Balasore, Bhadrak, Cuttack, Dhenkanal, Ganjam, Jagatsinghpur, Jajapur (Jajpur), Puri
- **Puducherry:** Karaikal, Mahe, Puducherry, Yanam
- **Tamil Nadu:** Coimbatore, Erode, Thanjavur, Tiruchirappalli, Salem, Theni, Madurai
- **West Bengal:** Jalpaiguri, Cooch Behar, 24 Parganas (North & South), Howrah, Nadia, Darjeeling

4. COCONUT

- **Andaman & Nicobar Islands:** All parts of Andaman & Nicobar Islands
- **Andhra Pradesh:** East Godavari, Guntur, Khammam, Krishna, Kurnool, Nellore, Prakasam, Srikakulam, Visakhapatnam, Vizianagaram, West Godavari



- **Assam:** Barpeta, Baksa, Bongaigaon, Cachar, Chirang, Darrang, Dhemaji, Dhubri, Dibrugarh, Goalpara, Golaghat, Hailakandi, Jorhat, Karbi Anglong, Kamrup, Karimganj, Kokrajhar, Lakhimpur, Marigaon, N.C. Hills, Nagaon, Nalbari, Sibsagar, Sonitpur, Tinsukia, Udalguri
- **Bihar:** Purnia, Saharsa, Katihar, Madhepura, Bhagalpur
- **Chhattisgarh:** Bastar, Jagdalpur, Kondagaon, Narayanpur, Dantewada, Sukma, Bijapur
- **Goa:** North & South Goa
- **Gujarat:** Amreli, Anand, Vadodara, Bharuch, Bhavnagar, Jamnagar, Junagadh, Kutch, Navsari, Porbandar, Surat, Valsad
- **Karnataka:** Bagalkot, Bengaluru (Rural & Urban), Belgaum, Bellary, Bijapur, Chamarajanagar, Chickmagalore, Chickballapur, Chitradurga, Davanagere, Dharwad, Gadag, Gulbarga, Hassan, Haveri, Kodagu, Kolar, Koppal, Mandya, Mysore, Raichur, Ramanagara, Shimoga, Tumkur, Udupi, Uttara & Dakshina Kannada
- **Kerala:** Alappuzha, Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Kozhikode, Malappuram, Palakkad, Pathanamthitta, Thiruvananthapuram, Thrissur, Wayanad
- **Lakshadweep:** All parts of Lakshadweep
- **Maharashtra:** Raigad, Ratnagiri, Sindhudurg, Thane
- **Meghalaya:** East Khasi Hills, Jaintia Hills, West Garo Hills, East Garo Hills
- **Odisha:** Angul, Balasore, Bargarh, Bhadrak, Balangir, Boudh, Cuttack, Deogarh, Dhenkanal, Gajapati, Ganjam, Jagatsinghpur, Jajapur (Jajpur), Jharsuguda Kalahandi, Kendrapara, Kendujhar (Keonjhar), Khariar, Khurdha, Koraput, Malkangiri, Mayurbhanj, Nabarangpur, Nayagarh, Nuapada, Phulbani, Puri, Rayagada, Sambalpur, Sundergarh
- **Puducherry:** Karaikal, Mahe, Puducherry, Yanam
- **Tamil Nadu:** Ariyalur, Coimbatore, Cuddalore, Dharmapuri, Dindigul, Erode, Kanchipuram, Kanyakumari, Karur, Krishnagiri, Madurai, Nagapattinam, Perambalur, Pudukkottai, Ramanathapuram, Salem, Sivaganga, Thanjavur, Nilgiris, Theni, Tiruchirappalli, Thiruvallur, Tiruvannamalai, Thoothukudi, Tirunelveli, Tiruppur, Vellore, Villupuram, Virudhunagar
- **Tripura:** Dhalai District, North, South & West District
- **West Bengal:** Bankura, Birbhum, Burdwan, Cooch Behar, Uttar & Dakshin Dinajpur, Darjeeling, Hooghly, Howrah, Jalpaiguri, Malda, Midnapore (East & West), Murshidabad, 24 Parganas (North & South), Nadia, Purulia





ECOLOGICAL REQUIREMENTS

ARECANUT

Arecanut grows at an altitude up to 1,000 m above sea-level. In most of the states, it is grown in the plains. The crop flourishes well at a temperature range of 14°-36°C. Extremes of temperature and wide diurnal variations are not conducive for desirable performance. The largest area of arecanut is found in gravelly laterite soils of red clay. In parts of Karnataka, arecanut is planted in fertile clay soils with an admixture of tank silt. Sticky clay, sandy, brackish and calcareous soils are not favourable for its cultivation.

CASHEWNUT

Cashew tolerates wide range of ecological factors. The distribution of cashew is restricted to altitude below 700m where the temperature does not fall below 20°C for prolonged periods. However, best production is noticed up to the altitude of 400m with at least 9hr sunlight/day from December-May. It grows at reasonably high temperatures and does not tolerate prolonged period of cold and frost especially during the juvenile period. However, temperature above 36°C between the flowering and fruiting period could adversely affect the production.

It can adapt to dry conditions as it is hardy and drought resistant. However, it performs better where at least a minimum of 600mm of rain is received in a year. Prolonged dry spells, frost, foggy weather and heavy rains during flowering and initial fruit setting also affect production. It is very sensitive to water logging and hence heavy clay soils with poor drainage conditions are unsuitable for its cultivation. Excessive alkaline and saline soils also do not support its growth. Otherwise, it grows in almost all soil types and performs very well in red sandy loams, laterite soils and coastal sands. The soil pH should be acidic. More than 8 pH is not suitable for its commercial cultivation. Though cashew is considered to be very hardy and drought resistant, it grows better where water table is high. It also responds to supplementary irrigation during the summer months.

COCOA

Cocoa is grown in wide variety of soils, though most of such soils of high rainfall areas are relatively coarse-textured and acidic to neutral. Virgin, freshly cleared forest soils are used for cultivation of cocoa. The soils should be rich in organic matter and nitrogen, well-drained and acidic to neutral in reaction. A depth of up to 1.5m is necessary for cocoa.

Temperature and rainfall affect the growth of cocoa. The optimum range of temperature of cocoa-growing regions is 15°-32°C. The absolute minimum temperature for any reasonable period should be >10°C, below which frost injury takes place. Rainfall above 300mm favour incidence of black pod and vascular streak dieback. Rainfall below 1,500mm necessitate irrigation. Proper distribution of rainfall is more important than the total amount. The pattern of rainfall in the cocoa belt is totally different with the bulk of rain received in 2 or 3 months during South West monsoon.

COCONUT

Coconut grows at a altitude up to 900m above sea-level. Well-distributed rainfall of 800-2,500mm/year is ideal. In regions, where prolonged dry spell occurs, irrigation is essential. Coconut can also withstand water logging during the rainy season. To get highest yield average annual temperature of 27°C with a diurnal variation 5°-7°C is optimum. Low temperature particularly below 7°C results in cold injuries to the palms, resulting in abnormal fruit development. Warm and humid conditions are desirable for its cultivation. The humidity should be 80-90%. Since coconut palms love sunlight, its growth is affected in overcrowded plantations.

Laterite, lateritic red, sandy, alluvial sandy, alluvial coastal and black soils are good for coconut cultivation. Laterite and lateritic soils in humid tropical zones in the western and eastern belts of India are the predominant soils herein coconut is extensively cultivated. These are highly weathered, moderately deep to deep loamy to clayey, well-drained and predominantly acidic with a pH of 4.5-6.8.



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