



## Entrepreneur India

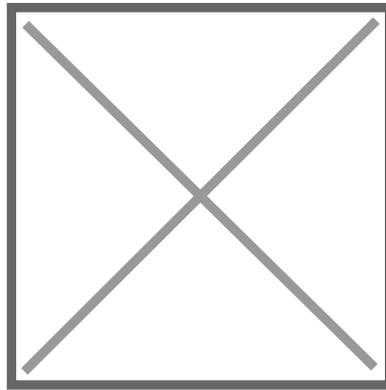
106-E, Kamla Nagar, New Delhi-110007, India.

Tel: 91-11-23843955, +91 9097075054

Mobile: +91-9097075054

Email: [npcs.ei@gmail.com](mailto:npcs.ei@gmail.com), [info@entrepreneurindia.co](mailto:info@entrepreneurindia.co)

Website: [www.entrepreneurIndia.co](http://www.entrepreneurIndia.co)



## Tropical, Subtropical Fruits & Flowers Cultivation

<b>Code</b>	NI123
<b>Format</b>	paperback
<b>Indian Price</b>	₹1075
<b>US Price</b>	\$125
<b>Pages</b>	600
<b>ISBN</b>	8186623884
<b>Publisher</b>	National Institute of Industrial Research

### Description

Tropical and subtropical plants grow in tropical jungles around the world. These plants often produce stunning blooms in a range of colors, and bring a unique and exotic feel

to their growing environment. Although they hail from moist areas, many tropical and subtropical plants require warmth more than moisture. Some species of tropical plants are therefore quite easy to grow in warm, non tropical areas. One of the great characteristics of tropical plants is that they keep growing all season. There are thousands of tropical and subtropical fruits and flowers. The tropics have the capacity to produce large quantities of fruit and international trade is adding new kinds as rapid shipment possibilities increase. Some tropical fruits such as the banana, mango and pineapple are now as familiar as the apple and pear in temperate regions. Other examples of tropical fruits are grape, papaya, litchi, guava, coconut etc. In comparison with fruits of temperate regions, many tropical species have been much neglected in international markets. Citrus cultivation is carried out on a large scale. Citrus is grown worldwide although they are tropical plants so that most of the commercial groves are in subtropical regions. It is usually grown at sea level where sufficient moisture is readily available, or under irrigation. Any well drained soil, except an extremely sandy one, is suitable. The fruits ripen at different times of the year depending on the species and variety. There are various kind of tropical flowers; Aster (*Callistephus chinensis*), Jasmine (*Jasminum* sp.), Calendula (*Calendula officinalis*), Carnation (*Dianthus caryophyllus*), Lily (*Lilium* spp.), Narcissus (*Narcissus* spp.), Orchids and many more. Flowers require sincere, patient, soft, affectionate as well as expert handling. Most houseplants are tropical plants. That's why they do so well indoors, at temperature levels humans find comfortable in their homes, around 60 F to 90 F. More technically, tropical plants are defined as all vegetation growing in a wide band around the equator between the Tropic of Cancer and the Tropic of Capricorn. Just north and south of that band are the subtropical areas, also rich in plants of interest to our group.

This book basically deals with seed propagation extraction and handling, effect of seed treatment and temperature on germination, vegetative propagation, effect of rootstocks on mineral composition, type of cutting, growth substances and season, postharvest management of fruits and vegetables, factors affecting postharvest life of flowers, postharvest management of flowers, postharvest management of spices, postharvest management of plantation crops, control of ripening process, pelletization, transportation, storage etc.

Plant propagation is an important aspect of agriculture in general and horticulture in particular. This book contains new methods for cultivation of tropical, subtropical fruits and flowers. The book is very useful for agriculture universities library, consultants, new entrepreneurs, plantation companies, farmers who wants to update their knowledge and adopt new cultivation techniques.

## Content

## 1. CITRUS

Seed Propagation

Extraction and handling

Viability

Storage

Effect of Seed Treatment and Temperature on Germination

Seed treatment to control Fungal diseases

Polyembryony

Vegetative Propagation

Cutting

Air-Layering

Budding

Methods of Budding

Selection, Preparation and Storage of Budwood

Time of Budding

Age of Rootstock and Height of Budding

Wrapping Material and Lopping

Decline of Dudded Tree

Rootstocks

Suitability of Rootstocks

Effect of Rootstocks on Tree-size, Yield and

Quality of Fruits

Incompatibility

Disease and Pest Resistant Rootstocks

Frost-resistant Rootstocks

Effect of Rootstocks on Mineral Composition

Dwarfing Rootstocks

Rootstock in Relation to Soil

Salt Tolerant Rootstock

Drought Tolent Rootstock

Interstock

Micropropagation

Shoot-tip Grafting

## 2. GRAPE

Seed Propagation

Germination

Effect of Temperature

Effect of Growth Substances and Other Chemicals

Effect of Irradiation

Biochemical Changes

Vegetative Propagation

Cutting

Type of Shoot and Length of Cutting

Effect of Season and Temperature

Effect of Water Treatment

Effect of Growth Substances

Mist and Media

Other Treatments Influencing Root Formation

Storage of Cutting

Biochemical Changes During Root Formation

Anatomy of Root Formation

Single-Bud Cutting

Layering

Grafting

Methods

Effect of Rootstock on Graft Union

Effect of Season

Effect of Growth Substances and Other Chemicals

Stratification

Use of Paraffin

Other Factors Influencing Graft Union

Storage of Graft

Biochemical changes

Top Working

Budding

Methods

Effect of Season

Effect of Rootstock

Storage of Bud

Effect of Methods of Propagation

Source of Scion

Rootstock

Adaptability of Soil and Climate

Disease and Nematode Resistant Rootstock

Effect of Rootstock on Growth, Yield and Quality

Effect of Rootstock on Mineral Composition

Incompatibility

Micropropagation

Anther Culture

Ovule and Embryo Culture

Protoplast Culture

Microcutting

Growth Variation

### 3. BANANA

Seed Propagation

Vegetative Propagation

Suckers, Peepers and Corms

Micropropagation

### 4. MANGO

Seed Propagation

Polyembryony

Storage

Germination

Vegetative Propagation

Cutting

Part and Age of Plant

Effect of Forcing, Ringing and Etiolation

Effect of Bottom Heat

Effect of Growth Substances and Other Chemicals

Effect of Age of Cutting, Bottom Heat and

Growth Substance

Life of Cutting

Biochemical Changes

Layering

Air-Layering

Etiolation

Media

Effect of Growth Substances

Biochemical Changes

Stooling

Grafting

Method

Effect of Stock and Scion on Graft Union

Effect of Season

Effect of Growth Substances

Anatomy of Graft Union

Budding

Methods

Budding in Situ

Effect of Stock and Scion

Season

Growth Substance

Storage of Budwood

Anatomy of Bud-Union  
Effect of Different Methods of Propagation  
Rootstock

Effect of Rootstock on Growth and Yield

Salt Tolerance

Anatomical Screening

Micropopagation

5. PINEAPPLE

Seed Propagation

Germination

Vegetative Propagation

Type of Planting Material

Size and Weight of Planting Material

Storage of Planting Material

Micropropagation

6. PAPAYA

Seed Propagation

Storage

Germination

Vegetative Propagation

Cutting

Grafting

Micropropagation

7. LITCHI

Seed Propagation

Germination

Vegetative Propagation

Cutting

Humidity

Effect of Growth Substances

Layering

Air-Layering

Media

Season

Growth Substances

Wrapping Material

Biochemical Changes

Stooling

Grafting

8. GUAVA

Seed Propagation  
Germination  
Vegetative Propagation  
Cutting  
Type of Cutting  
Season  
Humidity  
Effect of Growth Substances  
Growth Substances and Media  
Type of Cutting and Growth Substances  
Biochemical Changes  
Root Cutting  
Layering  
Air-Layering  
Methods  
Effect of Growth Substances  
Stooling  
Grafting  
Type of Scion  
Season  
Budding  
Methods  
Season  
Rootstock  
Effect of Rootstock on Growth and Yield  
Disease and Pest Resistant Rootstocks  
Micropropagation  
9. COCONUT  
Seed Propagation  
Germination  
Time of Seed-Nut Harvest  
Storage of Nut  
Selection of Nuts  
Seed Treatment  
Raising of Seedlings  
Time of Planting  
Method of Planting  
Watering  
Seedling Growth  
Vegetative Propagation  
Layering

Micropropagation

## 10. CASHEWNUT

Seed Propagation

Germination

Seedling Growth

Vegetative Propagation

Cutting

Effect of Growth Substances

Effect of Ringing and Growth Substances

Layering

Air-Layering

Effect of Growth Substances

Stooling

Grafting

Methods

Season

Age of Stock and Season

Budding

Top Working

Micropropagation

## 11. AVOCADO

Seed Propagation

Storage and Viability

Germination

Seedling Growth

Vegetative Propagation

Cutting

Type of Cutting

Etiolation and Ringing

Effect of Growth Substances

Clonal Variation

Type of Cuttings and Humidity

Growth Substances and Temperature

Type of Cutting and Temperature

Type of Cutting Temperature and Media

Type of cutting, Growth Substances and Humidity

Type of Cutting Etiolation and Growth Substances

Endogenous Growth Substances

Leaf Cutting

Layering

Air-Layering

Grafting  
Methods  
Storage of Scion  
Anatomy of Graft Union  
Top Working  
Budding  
Methods  
Comparison between Grafting and Budding  
Rootstock  
Success  
Effect of Vigour and Yield  
Salt Tolerance  
Resistance to Chlorosis  
Resistance to Diseases  
Interstock  
Control of Sprout from Rootstock  
Micropropagation  
12. OLIVE  
Seed Propagation  
Germination  
Stage of Maturity  
Storage  
Seed Development and Growth Substances  
Temperature  
Seed Treatment  
Vegetative Propagation  
Ovuli  
Sucker  
Cutting  
Type of Cutting  
Effect of Growth Substances  
Media  
Type of Cutting and Growth Substances  
Effect of Growth Substance and Fungicide  
Effect of Growth Substances and Nutrients  
Growth Substances and Media  
Growth Substances and Cultivars  
Growth Substances and Season  
Growth Substance and Humidity  
Season  
Season and Temperature

Season and Media  
Cultivar and Temperature  
Media and Humidity  
Type of Cutting, Growth Substances and Season  
Type of Cutting, Growth Substances and Media  
Type of Cutting, Growth Substances and Humidity  
Cultivar, Growth Substances, Media and Season  
Media, Temperature and Humidity  
Growth Substance, Temperature and Humidity  
Layering  
Grafting  
Methods  
Rootstock for Grafting  
Anatomy of Graft Union  
Budding  
Budding and Grafting  
Rootstock  
Micropropagation  
13. SAPOTA  
Seed Propagation  
Vegetative Propagation  
Layering  
Etiolation and Girdling  
Effect of Growth Substances  
Metabolic Changes  
Grafting  
Rootstock  
Micro Propagation  
14. BER  
Seed Propagation  
Development of Seed  
Germination  
Factors Affecting seed Germination  
Seed Treatment  
Media  
Seedling Performance  
Vegetative Propagation  
Cutting  
Effect of Growth Substances  
Effect of Temperature  
Layering

Air-Layering  
Effect of Growth Substances  
Stooling  
Budding  
Top Working  
Grafting  
Rootstock  
Micropropagation  
15. FIG  
Seed Propagation  
Vegetative Propagation  
Cutting  
Type of Cutting  
Type of Cutting and Season  
Effect of Growth Substances  
Type of Cutting and Fungicide  
Micropropagation  
16. JAMUN  
Seed Propagation  
Germination  
Vegetative Propagation  
Cutting  
Type of Cutting  
Effect of Growth Substances  
Layering  
Grafting  
Budding  
17. JACKFRUIT  
Seed Propagation  
Germination  
Vegetative Propagation  
Cutting  
Layering  
Air-Layering  
Stooling  
Grafting  
Budding  
Rootstock  
Micropropagation  
18. DATEPALM  
Seed Propagation

Germination  
Temperature and Chemicals  
Histochemical Changes  
Vegetative Propagation  
Offshoot  
Micropropagation  
19. ANONA  
Seed Propagation  
Dormancy  
Germination  
Vegetative Propagation  
Cutting  
Grafting  
Budding  
Rootstock  
Micropropagation  
20. POMEGRANATE  
Vegetative Propagation  
Suckers  
Cuttings  
Type of Cutting  
Effect of Growth Substances  
Air-Layering  
Top-Working  
Micro Propagation  
21. PERSIMMON  
Seed Propagation  
Storage and Viability  
Germination  
Seedling Growth  
Vegetative Propagation  
Sucker  
Root Cutting  
Grafting  
Method  
Season  
Storage of Scion  
Budding  
Rootstock  
Micro Propagation  
22. PHALSA

Vegetative Propagation

Cutting

Type of Cutting

Effect of Growth Substance and Fungicides

Anatomy of Root Formation

Layering

Grafting

23. MULBERRY

Seed Propagation

Viability

Germination

Vegetative Propagation

Cutting

Species

Effect of Growth Substances and Nutrients

Anatomy of Root Formation

Layering

Budding

Micropropagation

ORNAMENTAL PLANTS

24. ANNUAL FLOWERS

Classification

Winter Season Annuals

Summer Season Annuals

Rainy Season Annuals

Climate and Soil

Varieties

Acroclinium

Ageratum

Amaranthus

Anchusa

Antirrhinum

Arctotis

Balsam

Calendula

Candytuft

Carnation (annual)

Celosia

China Aster

Chrysanthemum (annual)

Cineraria  
Clarkia  
Coreopsis  
Cornflower  
Cosmos  
Daisy  
Dianthus  
Dimorphotheca  
Eschscholzia  
Gaillardia  
Garden Poppy  
Gazania  
Godetia  
Gomphrena  
Gypsophila  
Helichrysum  
Hollyhock  
Larkspur  
Limonium  
Linaria  
Lupin  
Marigold  
Matricaria  
Mignonette  
Myosotis  
Nasturtium  
Nemesia  
Nicotiana  
Nigella  
Pansy  
Petunia  
Phlox  
Portulaca  
Primula  
Rudbeckia  
Salvia  
Scabiosa  
Schizanthus  
Stock  
Sunflower  
Sweet Alyssum

Sweet Pea  
Sweet Sultan  
Sweet William  
Venidium  
Viola  
Wall Flower  
Zinnia  
Propagation  
Cultivation  
Planting  
Manuring and Fertilization  
Growth and Flowering  
Aftercare  
Irrigation  
Harvesting and Postharvest Management

## 25. ANTHURIUM

Climate and Soil  
Varieties  
Red  
Orange  
White  
Pink  
Obake Types  
Propagation  
Cultivation  
Planting  
Manuring and Fertilization  
Aftercare  
Irrigation  
Harvesting and Postharvest Management

## 26. CARNATION

Climate and Soil  
Varieties  
Propagation  
Growing Structures  
Cultivation  
Planting  
Pinching  
Flower Regulation  
Supplementary Lighting  
Growth Regulators

Nutrition  
Aftercare  
Irrigation  
Harvesting and Postharvest Management  
Harvesting Stage  
Grading  
Conditioning of Flowers  
Packaging and Transportation  
Physiological Disorders

## 27. CHRYSANTHEMUM

Climate and Soil  
Varieties  
Garland Purpose  
Cut Spray  
Propagation  
Seeds  
Suckers  
Cuttings  
Cultivation  
Training  
Manuring and Fertilization  
Aftercare  
Irrigation  
Harvesting and Postharvest Management

## 28. GLADIOLUS

Climate and Soil  
Varieties  
Propagation  
Seeds  
Tissue Culture  
Corm Dormancy  
Cultivation  
Land Preparation  
Planting  
Manuring and Fertilization  
Interculture  
Irrigation  
Harvesting and Postharvest Management  
Physiological Disorder

## 29. JASMINE

Climate and Soil

Varieties

J. sambac

J. grandiflorum

J. auriculatum

J. multiflorum

J. arborescens

J. calophyllum

J. flexile

J. humile

Propagation

Cultivation

Planting

Pruning

Manuring and Fertilization

Aftercare

Irrigation

Harvesting and Postharvest Management

Physiological Disorders

30. ORCHIDS

Climate and Soil

Varieties

Propagation

Cultivation

Planting

Manuring and Fertilization

Aftercare

Irrigation

Harvesting and Postharvest Management

Physiological Disorders

31. ROSE

Climate and Soil

Varieties

Propagation

Cultivation

Planting

Pruning

Manuring and Fertilization

Irrigation

Weeding

Mulching

Disbudding and Pinching

Suckers

Harvesting and Postharvest Management

MANAGEMENT OF DISEASES

32. DISEASES OF FRUITS

33. MANAGEMENT OF PESTS

Biological Control

Mechanical Control

Physical Control

Cultural Control

Chemical Control

Inorganic Insecticides

Organic Insecticides

Naturally Occurring

Uses of Some Common Insecticides

Specific Control Measure to Important Pests of

Some Common Crops

Fruits

34. POSTHARVEST MANAGEMENT OF PLANTATION CROPS

Coconut

Dry Processing of Coconut

Copra Production

Oil extraction

Copra Moisture Meter

Copra Storage

Extraction of Oil from Copra

Coconut Oil

Edible Copra

Wet Processing of Coconut

Desiccated Coconut

Coconut Cream

Coconut Milk Powder

Virgin Oil

Medium/low-fat, Desiccated Coconut

Coconut Cheese

Coconut Syrup

Coconut Honey

Tender coconut water

Coconut Byproducts

Coconut Water

Husk

Natural Fibre Extraction

Mechanical Extraction  
Arecanut  
Chali  
Kalipak  
Scented Supari  
Other Uses of Arecanut  
Oil Palm  
Sterilization  
Stripping  
Digestion  
Pressing  
Clarification  
Purification  
Nut Recovery  
Cashew  
Cashew Nut Processing  
Shelling  
Kernel Drying  
Peeling  
Grading and Conditioning  
Packaging of Kernels  
Cashew Nut Shell Liquid (CNSL)  
Value-added Products of Cashew Apple  
Cocoa  
Primary Processing  
Storage of Dried Beans  
Final Processing  
Press System  
Expeller System  
Chocolate Processing  
35. POSTHARVEST MANAGEMENT OF SPICES  
Black Pepper  
Despiking  
Drying  
Drying Surface  
Dry Recovery  
Value-added Products  
Cardamom  
Curing  
Value-added Products  
Turmeric

Ginger

Value-added Products

Clove

Value-added Products

Cinnamon

Value-added Products

Nutmeg and Mace

Value-added Products

Allspice

## 36. POSTHARVEST MANAGEMENT OF FLOWERS

Causes of Deterioration of Harvested Flowers

Growing Condition

Mechanical Injury

Bacterial and Fungal Infections

Plugging of Xylem Vessels of cut Flowers

Moisture Content

Water Quality

Ethylene Gas

Heat Damage

Factors Affecting Postharvest Life of Flowers

Stage of Harvesting

Water Relations

Respiration

Relative Humidity

Growth Regulators

Preservative Solutions

Precooling and Storage

Packing and Transporting

Home Care of Cut Flowers

Care And Management of Different Types of

Flowers Loose Flowers

Aster (*Callistephus chinensis*)

Crossandra (*Crossandra undulaefolia*)

Jasmine (*Jasminum* sp.)

Tuberose (*Polianthes tuberosa*)

Cut Flowers

Alstroemeria spp.

Amaryllis and Hippeastrum

Anthurium (*Anthurium andreanum* and

*A. scherzerianum*)

Antirrhinum or Snapdragon (*Antirrhinum majus*)

Bird-of-paradise (*Strelitzia reginae*)  
Calendula (*Calendula officinalis*)  
Carnation (*Dianthus caryophyllus*)  
Freesia (*Freesia refracta*)  
Gerbera (*Gerbera jamesonii*)  
Gladiolus (*Gladiolus* spp.)  
Gypsophila (*Gypsophila paniculata*)  
Lily (*Lilium* spp.)  
Narcissus (*Narcissus* spp.)  
Orchids (*Arachnis*, *Aranda*, *Aranthera*, *Ascocendra* and *Epidendrum*)  
Cattleya  
Cymbidium  
Dendrobium  
Odontoglossum and Oncidium  
Paphiopedilum  
Phalaenopsis  
Rose (*Rosa hybrida*)  
Tuberose (*Polianthes tuberosa*)  
Zinnia (*Zinnia elegans*)

## 37. POSTHARVEST MANAGEMENT OF FRUITS AND VEGETABLES

Preharvest Factors  
Selection of Varieties  
Cultural Operations  
Preharvest Treatments  
Maturity  
Harvesting  
Postharvest Factors  
Curing  
Degreening  
Pre-cooling  
Washing and Drying  
Sorting and Grading  
Disinfestation  
Postharvest Treatments  
Waxing  
Control of Ripening Process  
Ripening of fruits  
Pre-packaging in Plastic Films  
Packaging  
Pelletization  
Transportation

Storage  
Irradiation

## About Niir

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.