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.

Contents

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 Tolerant 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 Head 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
Micropopagation
6. PAPAYA
Seed Propagation
Storage
Germination
Vegetative Propagation
Cutting
Grafting
Micropopagation
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
Areca nut
Chali
Kalipak
Scented Supari
Other Uses of Areca nut
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
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
Phalaenopais
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. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.


NPCS also publishes varies process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.