The term spices and condiments applies to such natural plant or vegetable products and mixtures thereof, used in whole or ground form, mainly for imparting flavor, aroma and piquancy to foods and also for seasoning of foods beverages like soups. Usually spices are an ingredient used to season a dish in the meal during its preparation and condiments are for using at the table to enhance the dish as each individual's tastes prefer. The great mystery and beauty of spices is their use, blending and ability to change and enhance the character of food. Spices and condiments have a special significance in various ways in human life because of its specific flavours, taste, and aroma. Spices and condiments play an important role in the national economies of several spice producing, importing and exporting countries. India is one of the major spice producing and exporting countries. Most of the spices and herbs have active principles in them and development of these through pharmacological and preclinical and clinical screening would mean expansion of considerable opportunities for successful commercialization of the product. Spices can be used to create these health promoting products. The active components in the spices phthalides, polyacetylenes, phenolic acids, flavanoids, coumarines, triterpenoids, serols and monoterpenes are powerful tools for promoting physical and emotional wellness.

Some of the fundamentals of the book are definition of spices and condiments nomenclature or classification of spices and condiments, Indian central spices and cashew nut committee, origin, properties and uses of spices, forms, functions and applications of spices, trends in the world of spices, yield and nutrient uptake by some spice crops grown in sodic soil, tissue culture and in vitro conservation of spices, in vitro responses of piper species on activated charcoal supplemented media, soil agro climatic planning for sustainable spices production, potentials of biotechnology in the improvement of spice crops, medicinal applications of spices and herbs, medicinal properties and uses of seed spices, effect of soil solarization on chillies, spice oil and oleoresin from fresh/dry spices etc.

The present book contains cultivation, processing and uses of various spices and condiments, along with photographs of machinery/equipments with addresses of their manufacturers. The book is an invaluable resource for new entrepreneurs, agriculturists, agriculture universities and technocrats.
## Contents

1. DEFINITION OF SPICES AND CONDIMENTS
   - Nomenclature or Classification of Spices and Condiments
   - Brief History of Spices
   - First International Search for Indian Spices
   - Role of the ICAR in Spice Development in India
   - Spices Enquiry Committee
   - Indian Central Spices and Cashewnut Committee
   - Review of Researches on Cashewnut and 14 Spices
   - Setting-Up of the Central Plantation Crops Research Institute (CPCRI), Kasaragod
   - All-India Co-Ordinated Spices and Cashewnut Improvement Project (AICSCIP), Segregated to - All-India
   - Co-Ordinated Improvement Project for Spices (AICIPS)
   - Main Attainments of the Project (AICSCIP)
   - Segregation of AICSCIP into 2 Projects on Cashew and Spices
   - National Research Centre for Spices (NRCS, ICAR 1986)
   - The Indian Institute of Spices Research (1995), Calicut
   - Krishi Vigyan Kendra
   - Other Organizations Involved in Spices Development.
   - Division of Plant Introduction (IARI) and National Bureau of Plant Genetic Resources
   - Role of Department of Agriculture and Co-Operation, Ministry of Agriculture, Government of India
   - Directorate of Arecanut and Spices Development
   - Spices Development Council, Department of Agriculture and Co-operation
   - Agmark Laboratories and Directorate of Marketing and Inspection (DMI)
   - Role of the Cftri and other CSIR National Laboratories in the Technological Spice Development Programmes
   - Spices Export Promotion Council, Cochin
   - Cardamom Board
   - Functions of the Cardamom Board
   - Spices Board, Govt of India
   - Spices Cess Act
   - Indian Cardamom Research Institute
   - International Spices Development Activities
   - International Pepper Community (IPC), Jakarta, Indonesia
   - International Working Group on Spices (IWGS)
   - Development of International ISO Standards for Spices and Condiments and their Processed Products as well as their Methods of Test (ISO : TC 34/SC 7)
   - World Trade Organization (WTO)
   - Recommended Action Plans
   - Importance of Individual Spice Requirements
   - Trends in Individual World Markets
   - Forms of Spices and Spice Products Traded
   - Concluding Remarks : The Challenges for the Indian Spice Industry
   - Productivity Challenge
   - Quality Challenge
   - Value-Addition Challenge
   - Equity Challenge
2. ORIGIN, PROPERTIES AND USES OF SPICES
   - Ajowan
   - Ajowan Contains Calcium and Iron
   - Allspice
   - Anise/Aniseed
   - Annatto
Asafoetida/Asafetida
Basil
Bay/Laurel Leaf
Other Bay Leaves
Indian Bay Leaf
West Indian Bay Leaf
Indonesian Bay Leaf
Boldo Leaves
Caper
Caraway
Cardamom/Cardamon
Celery
Chervil
Chile Peppers
Chives
Cinnamon
Cloves
Coriander
Cumin and Black Cumin
Dill and Dillweed
Epazote
Fagara/Szechwan Pepper
Fennel Seed
Fenugreek
Galangal/Galangale/Galingale
Garlic
Ginger
Juniper
Kaffir Lime (Leaf, Fruit)
Kari Leaf
Lemon Balm
Lemon Verbena
Lemongrass
Lovage
Mace
Marjoram
Mints: Spearmint and Peppermint
Mustard
Myrtle
Nigella
Nutmeg
Onion
Oregano
Paprika
Parsley
Peppers: Black, White, Green, Long/Pippali, CUBEB
Poppy Seed
Rosemary
Saffron
Sage
Sassafras
Savory
Screw-Pine Leaf/Pandanus Leaf
Sesame
Sorrel
Star Anise
Sumac
Tamarind
Tarragon
Thyme
Turmeric/Tumeric
Wasabi
Zeodary

3. FORMS, FUNCTIONS AND APPLICATIONS
OF SPICES
Introduction
Spice Forms and Composition
Fresh whole Spices
Dried Spices
Spice Extractives
Essential (Volatile) Oils
Oleoresins (Non-Volatiles and Volatiles)
Other Extractives
The Functions of Spices
Primary function of Spices
Flavor, Aroma and Texture
Coloring Properties
Secondary Functions of Spices
Spices as Preservatives
Emerging Secondary Function of Spices
Spices as Medicines
Spice Preparation
Global Equipment used in Spice Preparation
Spice Applications
Marinades, rubs and Glazes
Spice Blends, Seasonings and Condiments
Spice Quality and Specifications
International Standards and Specifications
Maintaining Spice Quality
Fumigation
Controlled Atmosphere Storage
Sterilization

4. TRENDS IN THE WORLD OF SPICES
Trends in foods and spices
Understanding and Effectively Meting the Growing Demand for Authenticity
Authentic Ethnic Ingredients
Spices and Flavorings of Popular Authentic Ethnic Cuisines
Authentic Ethnic Flavorings
Authentic Preparation and Cooking Techniques
Presentation Styles
Fusion and Regional American Flavorings
Fusion Flavors
Regional American Flavors

5. YIELD AND NUTRIENT UPTAKE BY SOME SPICE CROPS GROWN IN SODIC SOIL
Introduction
Materials and methods
Results
Effect of Fertilizer
Nutrient Concentration and Uptake
Amelioration of Sodic Soil

6. TISSUE CULTURE AND IN VITRO CONSERVATION OF SPICES
Introduction
Cardamom
Clonal Multiplication
Regeneration of Plantlets from Callus
Inflorescence Culture
Black Pepper
Clonal Multiplication
Callus Cultures and Regeneration of Plantlets
Micropropagation of related species of Piper
Ginger
Clonal Multiplication
Regeneration of Plantlets from Callus
In Vitro Selection
Turmeric
Micropropagation
Plant Regeneration from Callus
Vanilla
Micropropagation
Saffron
Micropropagation
Tree spices
Micropropagation
In Vitro Proliferation of Mace and Synthesis of Flavour Components in Culture
Seed and herbal spices
Production of secondary metabolites
Synseed technology
In vitro Conservation of Spices Germplasm
Protoplast Isolation and Culture
Genetic Transformation
Isolation of DNA and Studies on Biochemical/molecular Markers
Conclusion

7. IN VITRO PROPAGATION OF BLACK PEPPER (PIPER NIGRUM L.)
Introduction
Materials and methods
Results

8. IN VITRO RESPONSES OF PIPER SPECIES ON ACTIVATED CHARCOAL SUPPLEMENTED MEDIA
Introduction
Materials and methods
Results and Discussion

9. TISSUE CULTURE STUDIES ON TREE SPICES
Introduction
Materials and methods
Results
Clove

10. MICROPROPAGATION OF SOME IMPORTANT HERBAL SPICES
Introduction
Materials and methods
Explants

Results

In Vitro Seed Germination

11. SOIL-AGRO CLIMATIC PLANNING FOR SUSTAINABLE SPICES PRODUCTION

Introduction

Agro-climatic Zonations-concepts and Backgrounds
Delineations of Agro Eco Region (AER) and Agro Eco Sub Regions (AESR)
Characteristics of Spice Growing Soils in Different Agro Eco Sub Regions
Bengal Basin-hot, Moist Subhumid Eco sub Region (Q8Cm7).

Sustainability of Agriculture

Potentials

Future Strategy

Water Management

Nutrient Management

12. WATER MANAGEMENT OF SPICE CROPS

Introduction

Irrigation

Rain Water Management (Conservation and Storage)

Irrigation Water Management

How to Get Water for Irrigation

How to Irrigate and Manage the Water

Summary

13. POTENTIALS OF BIOTECHNOLOGY IN THE IMPROVEMENT OF SPICE CROPS

The Potentials of Techniques Related to tissue culture

Somatic Embryogenesis

Organogenesis

Micropropagation

Secondary metabolites from cell cultures

In Vitro Germplasm Conservation

The Potentials of Genetic Engineering: Gene and Genome Analysis Techniques

Genetic Manipulation by Gene Technology

Agrobacterium Mediated Gene Transfer

Gene Transfer by Electroporation

Gene Transfer by Micro projectile Bombardment

Gene Marker and Genome Analysis Techniques

Non-PCR Based Marking Technique: Restriction Fragment Length Polymorphism

Arbitrary/semiarbitrary Primer Based PCR Techniques

Site Target PCR Technique

Marker Assisted Selection

14. SPICES IN AYURVEDA

Ayurvedic concept of Tri-Dosha

Dosha Related Elements

Effect of Spices on Tridosa

Tips from Grandmas remedies using spices

Cardamom

Turmeric

Asafoetida

Chilli

Cinnamon Bark

Dry Ginger

Mustard

Seed Spices

15. MEDICINAL APPLICATIONS OF SPICES AND HERBS
16. THE HEALING TOUCH OF SELECT SPICES
Garlic
Mustard
Cassia
Capsicum
Caraway
Asafoetida
Pepper Mint
Basil
Fennel
Kokam
Opium poppy
Aniseed
Tamarind
17. MEDICINAL PROPERTIES AND USES OF SEED SPICES
Coriander
Fenugreek
Fennel
Cumin
Ajwain
Celery
Dill (Sowa)
18. IN VITRO MICRORHIZOME PRODUCTION IN FOUR CULTIVARS OF TURMERIC (CURCUMA LONGA L.) AS REGULATED BY DIFFERENT FACTORS
Abbreviation
Introduction
Materials and methods
In Vitro Shoot Culture
Results
In Vitro Shoot Culture and Plant Regeneration
Role of sucrose, BA and photoperiod and their interaction in microrhizome formation
Harvesting, Storage Ami Germination of Microrhizome
19. ENHANCEMENT OF GENETIC VARIABILITY IN CHILLI (CAPSICUM ANNUUM L.)
Introduction
Materials and methods
Result
20. BREEDING OF INDIAN PAPRIKA FOR HIGH-VALUE ADDITIONS øORGANIC COLOUR á• AND øOLEORESIN á•
Introduction
Materials and methods
Results
21. USE OF COIR COMPOST AS A COMPONENT OF NURSERY MIXTURE FOR SPICES
Introduction
Materials and methods
Results
Experiment -I Effect of Terra Care as Substitute for Soil/Sand/ EYM in Conventional Potting Mixture on Growth of Black Pepper Cuttings
22. EFFECT OF SOIL SOLARIZATION ON CHILLIES (CAPSICUM ANNUUM L.)
Introduction
Materials and methods
Results
23. SUPERCritical FLUID EXTRACTION OF SPICES
24. INDIAN SPICE EXTRACTION TECHNOLOGY
Introduction
Indigenous Technology
Steam Distillation
Solvent Extraction
25. SPICE OIL AND OLEORESIN FROM FRESH/DRY SPICES
26. ONFARM POST HARVEST TECHNOLOGY FOR PLANTATION SPICES
(a) Cardamom
(b) Large cardamom
(c) Vanilla
(d) Pepper
(e) Cloves
(f) Nutmeg and Mace
(g) Cinnamon
Conclusion
27. BULBOUS SPICES
Onion
Indian Names
Description, Distribution and Economic Importance
Types of Onions
Varieties
Quality Parameters of a Good Variety
New Varieties Released
Crop Management
Climate
Soil and its Preparation
Rotation
Propagation
Irrigation
Interculture and Weeding
Roguing
Manuring
Importance of Nutritional Elements
Harvesting
Yield
Seed Production
Plant Protection
Marketing
Preparation for Market
Grading
Composition
Storage
Packaging
Post-harvest Handling
Marketing Within the Country
Factors Affecting Efficient Storage
How to Reduce Storage Losses in Onions
Processed Products
Quality Parameters of White Onions for Dehydration Purposes
Dehydration of Onion
Onion Powder
Onion Salt
Uses
28. GARLIC
Indian Names
Description and Distribution
Varieties
Quality Parameters for Garlic Bulbs for Breeding/Production
New Varieties
Crop Management
Soil and Climate
Manurial Requirements
Seed Rate and Sowing Methodology

Harvesting
Yield
Diseases and Insect Pests
Tissue Culture of Garlic
Marketing
Smoking
Packaging
Grading
Curing, Packaging and Storage
Curing
Packaging
Storage
Control Measures for Rubbering, Sprouting and Bulb Splitting Disorders
Composition
Commercial Forms of Dehydrated Garlic
Garlic Powder-An Improved Patented Process
Odourless Garlic Powder
Garlic Salt
Oil of Garlic
Garlic Oleoresin
Transport
Uses
Garlic as Condiment
Garlic Oil as Insecticide
Garlic Paste/Mixture as Biofungicide
Garlic Oil as an Adhesive
Garlic Residue with Antibacterial Properties
Garlic in Medicine
Garlic Use for Cancer
In Human Nutrition
Leek/Stone Leek Welsh Onion
Indian Names
Description and Distribution
Soil and Climate
Varieties
Crop Management
Raising Nursery/Transplanting
Manuring
Seed Production
Harvesting
Plant Protection
Composition
Post-Harvest Technology/Processing
Uses
Shallot
Indian Names
Description and Distribution
Crop Management
Uses
29. SEED SPICES
International Trade
More Recent International Trade
Future Prospects
Ajowan or Bishop's Weed
Indian Names
Description and Distribution
Area, Production and Export
Varieties/Selections
Crop Management
Climate and Soil
Cultural Practices
Diseases and Pests
Post-Harvest Technology
Grading
Composition
Adulterants
Packaging and Storage
Processed Products
Essential Oil
In Medicine
Comparative Antimicrobial Activity of Seed Spice Essential Oils
Aniseed
Indian Names
Description and Distribution
Varieties
Crop Management
Post-Harvest Technology
Composition/Quality
Quality Standards
Packaging
Storage and Transport
Processed Products
Distillation of Oil
Caraway, Black Caraway or Siah Zira
Indian Names
Description and Distribution
Caraway
Black Caraway
Area, Production and International Trade
Crop Management
Soil and its Preparation
Manuring/Fertilization
Methods and Time of Sowing
Intercropping
Interculture
Irrigation
Harvesting and Threshing
Yield
Plant Protection
Harvesting
Post - Harvest Technology
Packaging and Storage
Composition
Adulteration
Quality Standards (PFA/BIS/ISO)
Processed Products
Volatile Oil
Decarvonized Oil
Caraway Chaff Oil
As Food Flavourant
Medicinal Uses
30. A. CELERY SEED
Indian Names
Description and Distribution
Varieties
Crop Management
Land Preparation
Sowing Method
Fertilizers
Irrigation
Plant Protection
Tissue Culture
Harvesting and Threshing
Yield
Post - Harvest Technology
Cleaning/Preparation for the Market
Composition/Quality
Grading
Packaging and Storage
Contaminants Tolerance Limits
Processed Products
Seed-based Processed Products
Processed Products from Celery Leaves/Stalks
How to Handle and Store Celery Seed and its Products
As a Food Flavourant
In Medicine
In Perfumery
Fatty Oil
Celery Root Use
B.Celeriac
Description and Distribution
Crop Management
Composition
31. CORIANDER
Indian Names
Description and Distribution
Origin and Brief History
Botanical Description
Crop Management
Climate
Soil
Preparation of Land
Manuring and Application of Fertilizers
Varieties
Rotation and Mixture
Sowing Time
Seed Rate and Method of Sowing
Increasing Seed Germination
Irrigation
Weeding and Hoeing
IISR (ICAR) recommendations for crop management of coriander
Plant Protection
Tissue Culture
Harvesting and Threshing
Yield
International Quality Specifications for Seed Spices
Post-Harvest Technology
Preparation for the Market
Quality Grading
Composition of Seeds and Coriander Leaves
Packaging and Storage
Processed Products
Volatile Oil
Fatty Oil (Non-Volatile Oil)
Coriander Herb Oil
Coriander Oleoresin
Coriander Dal-an Improved CFTRI Process
Seasoning from Coriander Roots
As Flavourant
In Medicine
In Perfumery
Oleoresin-other Uses
Soluble Coriander (Superesin)
32. TREE SPICES
A. Aromatic Tree Spices
B. Acidulant Tree Spices
Cassia and Cinnamon
Nomenclature
Species of Cinnamomum Grown in India
I. Jangli-Darchini (CASSIA) or Karuva
Indian Names
Description and Distribution
Crop Management / Propagation
Propagation of Cassia
Air Layering in Cassia
II. Tejpat or Tamal Patra or Indian Cassia Lignea
Indian Names
Description and Distribution
Crop Management
Harvesting and Collection of Tamala Leaves
Preparation for Marketing
Yield
Essential Oil from Tamala Leaf
Leaf Oil
Bark Oil
III. Tezpat
Indian Names
Description and Distribution
Brief Description of Commercial Types and Classification or Grades of Cassia
China Cassia (Cassia Lignea)
Indonesia Cassia (Batavia Cassia, Java Cassia, Padang Cassia or Korintje Cassia, Cassia Vera)
Vietnam Cassia
Commercial Grades of Cassia in World Market
Physico-Chemical/Specification of Cassia Types
Packing
Storage
Transportation
33. FENNEL
Indian Names
Description and Distribution
Major Types of Fennel Seed in the World Market
Crop Management
Climate
Soil
Varieties
Land Preparation
Sowing Time
Seed Treatment, Seed Rate and Sowing Methods
Raising Seedlings in the Nursery
Transplanting of Seedlings
Intercropping
Manuring and Top-dressing with Fertilizers
Interculture Operations
Irrigation
Package of Practices Recommended
Tissue Culture
Plant Protection
Phased Harvesting and Threshing
Yield
Post-Harvest Technology
Commercial Classification/Grading
Composition
Packaging and Storage
Processed Products
Volatile Oil
Fixed Oil
As Food Flavourant
In Medicine
Residue (case) as Cattle Feed
Fenugreek
Indian Names
Description and Distribution
Area, Production and Exports
Crop Management
Climate and Soil
Preparation of Land
Manuring
Varieties
Package of Practices
Propagation
Seed Rate
Irrigation and Interculture
Tissue Culture
Plant Protection
Harvesting - Desi Methi
Production of Seed
Yield
Post-Harvest Technology
Packing and Storage
Composition
Marketing
Grades and Specifications
Processed Products
Fixed Oil
Volatile Oil
Effect of Roasting and Cooking on Nutritive Value
Oleoresin
Methi Leaves
As Food or Food Flavourant
In Medicine
As Cattle Feed, Veterinary Medicine
In Cosmetics; Dye/Hair Tonic and Cure for Baldness!
Leaves as a Vegetable Curry
Fixed Oil: Uses
34. CINNAMON OR TRUE CINNAMON
Indian Names
Description and Distribution
World Trade in Cinnamon
World Outlook/Prospects
Crop Management
Soil and Climate
Propagation
Manuring and Intercultivation
Weeding
Pruning/Cropping
Crop Improvement
Variability Studies
Plant Protection
Harvesting
Post-Harvest Technology
Preparation and Curing of Bark Spice for Marketing
Curing of Barks
Cutting and Peeling
Preparation of Quills
Drying
Utilization of Leaves and Twigs
Yield
Economics of Cultivation
Govt Incentives for Cinnamon Production and Marketing
Grading
Composition
World Types and Commercial Classification/Grades of Cinnamon
Type Sri Lanka (Ceylon)
Type Seychelles
Type Madagascar
Packaging of Different Commercial Classes of Cinnamon Bark and Powder
Packaging of Cassia and Cinnamon and their Products
Storage of Cinnamon and Fumigation
Transport of Cinnamon
Processed Products
Cinnamon/Cassia Bark Oil
Cinnamon-Leaf Oil
Cinnamon and Cassia Oleoresins
Other Products
Packaging and Storage
Stem Bark
Stem Bark Oil
Cinnamon-Leaf Oil
Root Bark Oil
Seed Oil
Cinnamon Buds
Cinnamon Wood
35. CLOVE
Indian Names
Description, Distribution and Economic Importance
Constraints in Large-scale Cultivation/Production of Cloves in India
Crop Management
Site for Clove Cultivation
Climate and Soil
Varieties
Propagation
Mixed Cropping
Soil-working
Weeding
Support
Manuring
Interculture/Pruning, Thinning
Irrigation
Soil-and-Moisture Conservation Works
Water Management
Crop Management and Breeding Strategy
Crop Improvement: The Breeding Strategy Adopted at the IISR (ICAR)
Harvesting and Curing
Plant Protection
Yield
Economics of Cultivation
Constraints in Clove Cultivation
Central and State Govt Incentives for Production and Marketing of Cloves
Post-Harvest Technology
Preparation of Cloves for the Market
Packaging and Storage
Processed Products
Pimenta Berry Oil
Pimenta-leaf Oil
Pimenta Oleoresin and Oil
As Food Flavourant
Use in Medicine
Berry Oil
Leaves
Pimenta Bark and Wood
A. Star-Anise
Indian Names
Description and Distribution
Area and Production
Crop Management
Soil and Climate
Propagation
Raising Nursery and Transplanting
Weeding
After-care Mulching
Manuring and Fertilization
Maturation and Flowering
Fruit Development
Harvesting of Fruits
Yield of Fruit
Post-Harvest Technology
Drying of Fruit
Processing Technology and Products
Manufacturing Essential Oil
Native vs Modern Distillation of Oil
Yield of Oil
Quality of Star-anise Oil
Quality Grading of Star-anise Oil
Leaf Oil
Fatty Oil
Star-anise as Flavourant
In Medicine
Star-anise Oil
B. Japanese star-Anise
Description and Distribution
Area, Production and Exports
Crop Management
Post-Harvest Technology
Processing Technology
38. BALM OR LEMON BALM
Indian Names
Description and Distribution
Crop Management
Soil and Climate
Propagation
Cultural Practices
Harvesting
Yield
Post-Harvest Technology
Processing Technology
Manufacturing Essential Oil
Physico-chemical Properties of Oil
As Food Flavourant
In Medicine
Basil or Sweet Basil (Tulsi)
Indian Names
Description and Distribution
Major Types of Basil
American Basil
Area, Production and Exports
Crop Management
Varieties
Soil and Climate
Breeding
Propagation
Plant Protection
Harvesting
Yield
Post-Harvest Technology
Packaging and Storage
Composition
Processed Products
Distillation of Oil
As Food Flavourant
In Perfumery and Cosmetics
In Medicine
As Insecticide, Insect-Repellent and Bactericidal
Use of Basil Seeds
Bay or Laurel Leaves
Indian Names
Description and Distribution
Post-Harvest Technology
Drying
Composition
Processing Technology
Essential Oil Recovery
Physico-chemical Properties of Volatile Oil
Bay Leaves for Flavouring
Fat from Bay or Laurel Berries
Laurel Wood Utilization
39. CURRY LEAF
Indian Names
Description and Distribution
Area, Production
Crop Management
Curry Leaf Cultivation in Homesteads of South Kerala
Raising Nursery
Manuring
Harvesting
Weeding
Prophylactic Measures for Plant Protection
Cost of Cultivation
Cultivars and their Sensitivity to Winter Temperature
Plant Protection
Termites
Post-Harvest Technology
Packing and Storage
Composition
Processed Products
Volatile Oil
Dehydrated Curry Leaves
As Food Flavourant
In Indigenous Medicine
In Perfume and Cosmetics
Fruits
Wood
Hyssop
Description and Distribution
Area, Production and Exports
Crop Management
Soil and Climate
Planting and Cultivation
Harvesting
Yield
Post-Harvest Technology
Composition
Processing Technology
Distillation of Essential Oil
Yield of Essential Oil
Physico-chemical Properties of Volatile Oil
As Condiment
In Medicine
Volatile Oil Uses
Marjoram
Indian Names
Description and Distribution
Crop Management
Soil and Climate
Propagation
Influence of Growth Regulators on Growth, Herbage and Essential Oil Yields
Harvesting
Flowering
Post-Harvest Technology
Drying, Packing and Storage
Composition
Processed Products
Volatile Oil
As Food Flavourant
In Perfumery and Cosmetics
In Medicine
40. PEPPERMINT
Indian Names
Description and Distribution
Crop Management
Propagation
Planting
Harvesting
Yield
Post-Harvest Technology
Drying and Packing
Composition
Processed Products
Volatile Oil
As Food Flavourant
In Perfumery and Cosmetics
In Medicine
Sage
Indian Name
Description and Distribution
Major Types of Sage in World Trade
Different Forms of Sage
Crop Management
Climate and Soil
Propagation
Planting
Harvesting
Yield
Post-Harvest Technology
Drying
Composition
Marketing/Trading
How to Handle and Store
Processed Products
Volatile Oil
As Food Flavourant
In Medicine
Use in Perfumery
As Anti-oxidant
Use of Residue
Uses of Seeds
Clary Sage (Salvia sclarea Linn.) or Garden Sage
Introduction
Savory
Indian Names
Description and Distribution
Area, Production and Exports
Crop Management
Soil and Climate
Propagation
Seed Rate, Method of Sowing and Weeding
Harvesting
Yield
Post-Harvest Technology
Processing Technology
Essential Oil of Savory
Composition of Dried Herb
Composition of Fresh Herb
Volatile Oil
Tarragou
Indian Names
Description and Distribution
Crop Management
Soil and Climate
Propagation
Planting Season
Harvesting
Post-Harvest Technology
Composition
Processing Technology
Essential Oil
Physico-chemical Properties of Oil
Precautions in the Storage of Oil
As Food Flavourant
In Medicine
In Perfumery
Thyme
Indian Names
Description and Distribution
Major Types of Thyme
Crop Management
Climate and Soil
Propagation
Post-Harvest Technology
Commercial Quality
Composition
Handling and Storage of Thyme
Processed Products
Thyme Extractives-Volatile Oil and Oleoresin
Thymol
As Food Flavourant
In Medicine
42. ASAFOETIDA OR ASAFETIDA
Indian Names
Description and Distribution
Types or Varieties of Asafoetida Imported into India
Method of Collection of Gum-resin
Crop Management
Varieties of Asafoetida
Types/Varieties of Asafoetida of Commerce
Quality Evaluation
Composition
Processed Products
Oil of Asafoetida
Oil of Galabanum
Compounded Asafoetida Powder and Tablets : A Simple CFTRI Process
As Food Flavourant
In Medicine
Calamus or Sweet Flag
Indian Names
Description and Distribution
Crop Management
Climate and Soil Requirements
Preparation of Land
Planting Method
Planting Time
Irrigation
Weeding
Manuring
Harvesting
Yield
Plant Protection
Post-Harvest Technology
Preparation for the Market
Adulteration
Composition
Processed Products
Volatile Oil
In Medicine
In Perfumery
As an Insecticide
In Foods Beverages and Liquors
43. GALANGAL
Description and Distribution
Economic Importance
Crop Management
Varieties/Races of Galangal
Planting
Plant Protection
Application of Manures/Fertilizers
Harvesting
Yield
Post-Harvest Technology
Composition
Volatile Oil
Oleoresin Content
Galangal Rhizomes
Galangal Oil
Galangal Oleoresin
Horse-Radish
Description and Distribution
Crop Management
Post-Harvest Processing Technology
Volatile Oil
Composition of Horse-radish
Adulteration
As Condiment
Horse-Radish Cream, Sauce or Relish
In Medicine
Long Pepper or Pipli
Indian Names
Description and Distribution
Crop Management
Soil and Climate
Propagating
Manuring
Harvesting
Yield
Plant Protection
Post-Harvest Technology
Drying and Packaging.
Composition
Processed Products
Volatile Oil
As Food Flavourant
In Medicine
44. SAFFRON
Indian Names
Description and Distribution
Crop Management
Soil
Climate
Land Preparation and Planting
Manures and Fertilizers
Irrigation
Interculture
Crop Rotation
Effect of Plant Density on Flower, Yield and Corm Production
Variation in Floral Characteristics of Saffron in different Kashmir Locations
Harvesting or Picking of Flowers and obtaining Saffron
Yield
Cost of Cultivation of Saffron
Economic Viability of Saffron Cultivation
Pests and Diseases
Recent Studies on Crop Management of Saffron in Iran
Effect of Fertilizers (NPK)
Post-Harvest Technology
Sun-Drying of Saffron in Kashmir
Effect of Different Processing (Different Drying and Dehydration Techniques)
Composition
Adulteration
Packaging and Storage
Marketing
Processed Products
As Flavourant and Colourant for Foods
Medicinal Properties
45. VANILLA
Indian Names
Description and Distribution
Commercial Forms of Vanilla
General Characteristics of Vanilla Forms
Qualitative Classification of Vanilla Pods
Crop Management
Climate
Soil
Preparation of Land
Providing Supports (Posts) for Vines
Planting
Manuring
After-care
Flowering and Natural Pollination
Hand-pollination
Pod Development
Vanilla Production Plan by Tissue-Culture Technique
Vegetative Propagation of Vanilla
Yield
Plant Protection
Diseases
Post-Harvest Technology
Curing
Vanilla Bean Packing and Storage
Composition
Adulteration/Substitution
Processed Products
Vanilla Extracts/Essences
Vanilla Sugar
Vanilla Oleoresin
Vanilla powder, Vanilla absolute and Vanilla Tincture
As Food Flavourant and in Perfumery
Vanillin

46. Machinery & Equipments

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.