

The Complete Book on Spices & Condiments (with Cultivation, Processing & Uses) 2nd Revised Edition

Author: NIIR Board of Consultants & Engineers

Format: paperback

Code: NI169

Pages: 888

Price: Rs 2275 | US\$ 200

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Shipping: 5 days

About the Book

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 Meeting 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 Tridosha

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 and 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 æORGANIC COLOUR • AND æOLEORESIN •

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
 Packing 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
 Grading
 Storage
 Transport
 Defective Cloves
 Composition
 Adulteration
 Quality Standards
 Packing of Cloves
 Packaging of Clove Oil
 Packaging of Clove Oleoresin
 Processed Products
 Clove-bud Oil
 Clove-stem Oil
 Clove-leaf Oil
 Oil of Mother Cloves
 Clove-root Oil
 As Food Flavourant
 In Medicine
 In Perfumery and Cosmetics
 Other Uses
 36. JUNIPER
 Indian Names
 Description and Distribution
 Crop Management
 Soil and Climate
 Propagation
 Flowering and Fruiting
 Harvesting of Berries
 Post-Harvest Technology
 Drying of Fruits (Berries)
 Grading
 Composition of Juniper Berries/Fruits
 Adulteration



Juniper Berry Essential Oil (Volatile Oil)
 Composition of Juniper Volatile Oil
 Manufacturing Alcoholic Beverages
 As Food and Food Flavourant
 Juniper Oil
 Other Parts of the Tree
 In Medicine
 Volatile Oil
 Juniper Wood
 Other Uses/by-Products
 Exhausted Fruits/Berries
 Juniper Needles
 Roots
 Wood
 Juniper Wood Oil
 Mace and Nutmeg
 Indian Names
 Mace
 Indian Names
 Description and Distribution
 Crop Management
 Climate and Soil
 Propagation by Nursery Technique
 Transplanting of Seedlings in the Field
 Mixed Cropping
 Manuring
 Mulching
 Interculture/Weeding
 Plant Protection
 Constraints in Nutmeg Cultivation
 Crop Improvement
 Sex Determination-Past, Present and Future
 Harvesting and Curing
 Yield
 Economics of Cultivation
 Central and State Govt Incentives for Production and Marketing
 Post-Harvest Technology
 Packaging of Mace and Nutmeg
 Grading
 Quality/Composition of Mace and Nutmeg
 Processed Products
 Mace Products
 Nutmeg Products
 Variations in Aroma/Flavour of Nutmeg and Mace Accessions
 Nutmeg
 Mace
37. PIMENTO OR ALLSPICE OR PIMENTA
 Indian Names
 Description and Distribution
 Description
 Distribution

Area, Production and Exports/Imports
Crop Management
Soil and Climate
Propagation
Transplanting of Seedlings
Weeding/After-Care
Aftercare : Fertilizer Schedule
Manuring
Successful Fruiting in Allspice-A Recent Achievement of NRCS (IISR, Calicut .)
Harvesting and Yield
Major Types of Allspice (Pimento)
Crop Improvement Strategy or Breeding Strategy
Yield of Berries
Plant Protection
Post-Harvest Technology
Grades/Types
The ISO Grades of Pimento (Whole and Ground)
Physical Requirements for Whole Pimento
Chemical Requirements of Whole Pimento
Storage of Pimento
Transport of Pimento
Composition
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
 Processed Products
 Volatile Oil
 In Medicine/Pharmaceuticals
 Waste Utilization
 Spearmint
 Indian Names
 Description and Distribution
 Crop Management
 Important Steps in its Successful Cultivation in India
 Composition
 Processed Products
 Volatile Oil
 Origanum
 Indian Names
 Description and Distribution
 Crop Management
 Soil and Climate
 Propagation
 Sowing
 After-care
 Harvesting
 Post-Harvest Technology
 Drying

Composition
Processed Products
Volatile Oil
As Food Flavourant
In Medicine
Other Uses
Parsley
Indian Names
Description and Distribution
Area, Production and Trade
Crop Management
Climate and Soil
Direct Sowing/Sowing in Nursery Beds
Transplanting of Seedlings
Manuring/Fertilizers
Harvesting
Yield
Post-Harvest Technology
Composition
Processed Products
Dehydrated Parsley
Volatile Oil
Fatty Oil
As Food Flavourant
In Medicine
41. ROSEMARY
Indian Names
Description and Distribution
Crop Management
Climate and Soil
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
 Propagation
 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

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.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various 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.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** npcs.india@gmail.com **Website:** NIIR.org