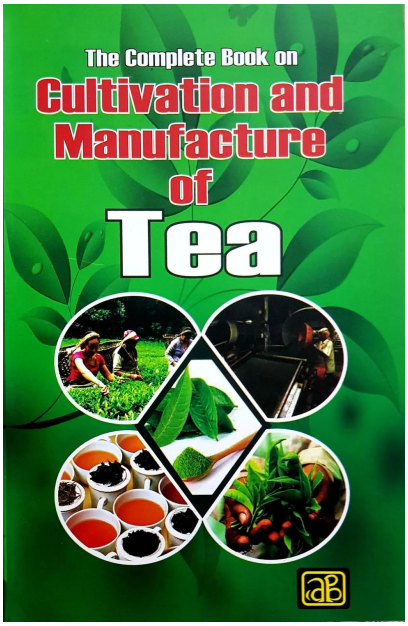
Entrepreneur India

106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, +91 9097075054
Mobile: +91-9097075054
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co



The Complete Book on Cultivation and Manufacture of Tea (2nd Revised Edition)

Code	NI242
Format	paperback
Indian Price	₹1625
US Price	$150
Pages	574
ISBN	9788178331683

Publisher	Asia Pacific Business Press Inc.

Description

Tea is one of the most popular beverages that are being consumed all over the world. Tea is known as a soothing drink and a way of life. Owing to its increasing demand, tea is considered to be one of the major components of world beverage market. Tea is very beneficial for health and is also known as anticarcinogenic properties. Green tea acts as an antiviral agent. Growing tea requires sufficient amount of work and there is additional level of work that must be incorporated to harvest it. Tea is cultivated in tropical and sub tropical regions. There are various kinds of tea such as black tea, green, oolong tea that can be obtained from real tea plant, Camellia sinensis. The making of different varieties of tea mainly depends upon plucking and rolling, spreading, storing process.

The handbook describes aspects of tea cultivation, ranging from the history of old crop, machinery & equipment for various Tea, biological control, organic tea- and many more. This is a sincere attempt to open up the world of this wonderful beverage, its cultivation methods, types of tea available worldwide, manufacturing process, to the common man.

Some of the fundamentals of the book are growth of tea in other countries, tea in Indian economy, biochemical constituents, pharmacological properties, selection, pollination and propagation, nutritional requirements, growth, photosynthesis and respiration, nursery management, water theory, oxidative degradation of protein, biological effect of polyphenols, analysis of tea, tea processing, green tea processing, tea bag production etc.

This book will be a mile stone for its readers who are new to this sector, will also find useful for entrepreneurs, tea scientists and tea research establishments.

Content

1. HISTORICAL EVIDENCES
Tea in India
Growth of Tea in Other Countries
Tea in Indian Economy
2. RELATION WITH HEALTH
The Core Compounds
Flavonoids in Tea Infusion
Antioxidant Activity of Tea Flavonoids
Tea Flavonoids and Cancer
Caveats

3. IMPORTANCE OF THERAPEUTIC COMPOUNDS
Polyphenols
Caffeine
Vitamins
Carbohydrates
Lipids
Triterpenoids
Carotenoids and Pigments
Minerals
Overall Distribution of Compounds
4. PRODUCTION OF THERAPEUTIC COMPOUNDS
Polyphenols
Variations in Specific Compounds
Changes During Processing
Theaflavins and Thearubigins
Discussion
5. BIOCHEMICAL CONSTITUENTS
Biochemical Constituents
Enzymes
Polyphenolic Compounds
Amino-acids
Phosphate Esters, Nucleotides and Caffeine
Carbohydrates
Lipids
Chlorophyll and Carotenoids
Volatile Compounds
Biochemical Changes during Leaf Processing
Withering
Rolling
Fermentation
Development of Aroma
Changes in Carotenes and Fatty Acid
Firing
Biochemical Basis of Tea Quality
6. PHARMACOLOGICAL PROPERTIES
Pharmacological Actions
Pharmacological Aspects Associated with Tea Consumption
Cardiovascular System
Cancer
Tea and Dental Health
Tea and Fluid Replenishment

Gastrointestinal System
Skin and Topical wound Healing Activity
Antimicrobial Action
Angiogenesis Inhibition
Absorption of Tea Flavonoids
Potential Health Concerns Associated with Tea Consumption
Tea and Iron Absorption
Conclusion
7. IMPORTANCE OF BLACK TEA
Composition and Chemistry of Tea
Pharmacological Properties of Tea
Antioxidative Effects of Tea
Modulation of Metabolizing/Detoxifiying Enzymes
Modulation of Immune Function
Antimutagenic Activity
Anticarcinogenic Activity
Prevention of Coronary Heart Disease
Germicidal and Antiviral Activity
Regulation of Intestinal Microflora
Prevention of Dental Caries
Conclusion
8. TAXONOMICAL PROPERTIES
Tea Varieties
(1) The China variety
(2) The Assam Variety
(3) The Cambod Variety
Biology of the Plant
Phasic and Vegetative Growth
Tea Flowers and Reproductive Phase
Dormancy
Longevity
Tea Gene Pool
Cytotaxonomy and Chromosome Numbers
Wild Populations of Tea
Germplasm Collection
9. SELECTION, POLLINATION AND PROPAGATION
Development of Seed Varieties
Vegetative Propagation and Development of Clones
Selection for Yield and Quality
Hybridisation
Interspecific Hybridisation

Polyploid Breeding
Mutation Breeding
Tissue Culture and Genetic Engineering
Breeding Strategies
Seed and Clone
Techniques of Vegetative Propagation and Clonal Selection
The Nucleus Plot
Manuring of Mother Bushes
Type of Cuttings
Time of Taking Cuttings
Nursery Bed and Shade
Use of Hormone in V.P.
Clonal Selection Procedure
Mother Bush Selection
Technique of the Seed Bari and Grafting
Bringing into Bearing
Collection
Sorting
Storage and Transport
Upgrading a Seed Bari (Seed Nursery)
Vegetative Propagation (V.P.)
The Mother Bush
The Nucleus Plot
Taking Cuttings
Setting the Cutting
10. CHARACTERISTICS OF SOIL BIOLOGY
Origin and Characteristics of Tea Soils
Soil: Physical Properties
The Basis of Soil Nutrition
Soil Acidity
Soil Physical Properties
Soil Texture
Soil Aggregate
Soil Compactness
Soil Management for Tilth
(a) Drainage
(b) Land Levelling
(c) Cultivation
(d) Lime or Dolomite Applications
(e) Soil Improvement
Soil Biology

Physical Environment
Rainfall
Temperature
Humidity
Wind Speed
Day Length
11. NUTRITIONAL REQUIREMENTS
Nutrient Composition of the Tea Plant
Assimilation of Various nutrients by Parts of the Plant
Individual Nutrients
Nitrogen
Basis of Nitrogen Absorption and Uptake
Sources of Nitrogen
Determination of Quantity for N: K ratio
Phosphorus
Increasing Phosphate Efficiency
Phosphate Uptake and Mycorrhiza
Phosphate Solubilising Microorganisms
Rock Phosphate: Amendments
Interactions of Phosphorus with Other Nutrients
Fertiliser with Soluble Phosphorus
Potash
Potassium Reactions in the Soil
Potassium in Growth Stages of Tea
Factors Affecting Potassium Uptake
Potassium Interactions
Nitrogen: Potash interactions
Interaction with Other Nutrients
Collateral Effects of Potassium
Sulphur
Sulphur Containing Fertilisers
Zinc
Other Micronutrients
Organic Fertilizers
Nutrition and Crop Quality
Deficiency Symptoms
12. GROWTH, PHOTOSYNTHESIS AND RESPIRATION
Carbon Input; Sink Source Ratio
Limitation of CO2 Assimilation
CO2 Assimilation and Light Limitation
Regulation of Photosynthesis

Regulation of Photosynthesis by Transport and Partitioning
Effect of Leaf Age on Photosynthesis
Photorespiration and Dark Respiration
Dry Matter Partitioning and Productivity
13. NURSERY MANAGEMENT
Nursery Management
Planting
Land Preparation
Planting Density
Field Planting
Planting Operations
Bringing up of Young Tea and Bush Formation
14. THEORY OF PRUNING, PLUCKING AND MAINTENANCE FOLIAGE
Theory of Pruning
Types of Pruning
Collar Pruning
Medium Pruning
Top or Light Pruning
Lung Pruning
Skiffing
Choice of Pruning System
Tipping
Shoot Growth
Leaf and Bud Dynamics
Plucking
Plucking System
Plucking Standard
Plucking Interval
Plucking and Maintenance Foliage
(1) Pruning: definitions
(2) Requirements before Pruning
(3) Pruning Administration
(4) Factors Affecting Pruning Time
(5) Crop Distribution
(6) Pruning Cycles
15. HISTORICAL PERSPECTIVE OF SHADE TREES
Historical Perspective of Shade Problem
The Genesis of Shade Problem
Effect of Shade per se
Shade and Light Intensity

Shade and Tea Leaf Temperature
Effect of Shade Trees on Light Climate
Shade and Partition of Growth
Shade Effect on Quality of Made Tea
Current Perspective
Sylviculture of Shade Trees
Mixture of Shade Tree Species
Intimate Mixtures
(a) Square Planting
(b) Triangular Planting
Non-Intimate Mixtures
(1) Tea and Shade Square Planted
Spacing of Shade
(i) Suggested Spacings
(ii) Planting of Shade Trees
Propagation of Shade Trees
16. WATER THEORY
Theory of Drainage
Approach to Drainage Problem
Problems in Tea Areas
Models of Drainage Systems and Water-table
Objective of Drainage
Diagnosis of Drainage Problems
A. Growth Pattern
B. Physical Indicators of Waterlogging
Outline of the Drainage
Designing the Main Drain
The Field Drains and Removal of Surface Water
The Drainage System
Construction of Drains
Pipe Drainage
Rationale of Irrigation
Parameters of Irrigation
Irrigation Requirement: Net and Gross Irrigation Requirements
Irrigation Frequency
Scheduling of Irrigation
Rainfall Deficit
Types of Irrigation
Irrigation Efficiency
Significance of Irrigation in Total Water Management
Soil Conservation

Criteria for Water Relation Between Soil and Tea Plants
Moisture
Soil Water
Moisture Extraction Pattern by Tea Roots
Effect of Drainage and Irrigation
Weed Effect
Effects of Weeds on Tea
Biology of Weeds
Weed Reproduction
Weed Density
Growth
Dispersal of Weeds
Weed Dispersal
Methods of Weed Control: The Manual Aspect
Chemical Weed Control
Herbicides in Tea
Herbicide Mixtures
Application Technology
Perspectives on Weed Management
Common Weeds of Tea
A. Dicotyledonous or Broad Leaved Weeds
B. Monocotyledonous and Grass Weeds
Outline of Weed Control
Manual Control
Mechanical Control
Chemical Weed Control
Preplanting Control of Thatch
Additives for Herbicides
Herbicide Mixtures ‘Cocktails’
Weed Control Outside the Tea Area
Equipment
Climatic Factors Affecting Weedicide Application
Safety Precautions
Herbicide Damage to Tea
17. DISEASES OF SEEDS AND CUTTINGS
Diseases of Tea Seeds and VP Nursery diseases
Leaf Diseases
Stem Diseases
Root Diseases
Strategies for Controlling Diseases
Outline of Disease Control

Leaf Diseases
Root Diseases
Secondary Stem Diseases
18. PESTICIDE MANAGEMENT
Crop Losses
Mite Phytophagy
Defoliators
Sap Feeding Insects
Root Damaging and Soil-borne Pests
Pests of Shade Tree and Ancillary Crops
Leaf and Petiole Eaters
Stem Borers
Seasonal Abundance of Pests
Pesticide Specifications for Tea
Pesticides: Applications and Management
Management of Pesticide Residues
Strategies in Pest Management
Outline of Pest Control
Mite Damage
Insect Attacks
Young Tea Sick or Dying
New Flush Stunted
19. BENEFICIAL IN CANCER
Lifestyle and Diet in Cancer
Effect of Tea in Animal Systems
Prevention of Cancer in Man
Effects of Tea on the Incidence of Human Cancer
Interaction of Genetic Actions in Carcinogenesis in Humans
20. CANCER PREVENTION
Cancer–an Overview
Cancer and the Intrinsic Defense Machinery of the Host: A Tug-of-War
Why Cancer Therapy Fails
Dietary Therapy
Why Tea?
Tea and Its Constituents - A Historic view
Hypothesis
(1) Direct Effect of Tea in Tumor Regression
(2) Indirect Effect of Tea in Cancer Prevention: Tea-induced Tumor Regression by Rejuvenation of Host’s Intrinsic Defense Machineries
Conclusion
21. OXIDATIVE DEGRADATION OF PROTEIN

Materials and Methods
Results
Discussion
22. BIOLOGICAL EFFECT OF POLYPHENOLS
Biological Effects
Chemoprevention
An Overview
23. PREVENTING BONE LOSS
Functions of Marketing
Promotional Techniques
The Product Concept
The Sales Process

24. ANALYSIS OF TEA
Analysis of Green Tea Leaf
Sampling
Polyphenols
Determination of Total Polyphenols
Separation and Identification of the Individual Polyphenols
Determination of Flavonol Glycosides
Determination of Flavylogens
Determination of Phenolic Acids
Amino Acids
Carbohydrates
Chlorophyll
Carotenoids
Minerals
Enzymes
Analysis of Manufactured Black Tea
Traditional Methods
Alkaloids
Polyphenols
Separation of the Polyphenols
Analysis of Theaflavins and Thearubigins
Determination of Total Tannin
Cream
The Aroma Complex
Analysis of Instant Tea
25. TEA PROCESSING
Types of Tea
Brief Outline of Tea Manufacturing Process

Withering
Rolling
Fermentation/Oxidation
Drying
Sorting and Grading
Storage and Packaging
Tea Manufacturing Process Flow Diagram-CTC
CTC
Orthodox
Withering
Rolling
Fermentation/Oxidation
Drying
Sorting and Grading
Storage and Packaging
Tea Manufacturing Process Flow Diagram-Orthodox
Tea Manufacturing Process
Quality Control
Oolong Tea
Oolong Tea Process
White Tea
Source of Technology
Machinery and Equipment
CTC Tea Processing
26. GREEN TEA PROCESSING
Green Tea Ingredients
Green Tea Processing
Pan Firing or Steaming
Rolling
Drying/Firing
Sorting/Grading/Packing
Tea Manufacturing Process Flow Diagram - Green Tea
Machinery and Equipment
Green Tea Processing (Moroccan Type)
27. TEA BAGS
Tea Bag Processing
Tea Bag Filter Papers
Non-Heat Sealable Filter Papers
Heat Sealable Filter Papers
Withering
Rolling

Drying
Milling
Blending
Measuring
Tea Bag Assembly
Tea Manufacturing Process Flow Diagram - Tea Bag
Process of Tea Bag Manufacturing
Machinery and Equipment
28. MACHINERY & EQUIPMENT FOR CTC TEA/
ORTHODOX TEA/OOLONG TEA/TEA BAGS
1. Withering
Axial Flow & Centrifugal Fans
Technical Data
Centrifugal Fans (Hot Air, Induced Draft and Fermenting Fans)
Technical Data
Direct Fired Oil/Gas Heaters
2. Rolling
Rotovanes (Rolling Solutions For CTC Tea)
Technical Data
Sifter-CTC Machines
Technical Data
Balanced Green Leaf Sifter
‘Rotomax’ Rolling Tables for Orthodox Tea
3. Fermenting/Oxidation
Continuous Fermenting Machines (The Ideal Fermenting Solution)
Technical Data
4. Drying
Fluidized Bed Tea Dryers
Technical Specification
Advanced Conventional Tea Dryers
Technical Specifications
Indirect Fired Coal/LECO/Firewood Heaters
(The Most Efficient Solid Fuel Based Indirect Fired Heaters for the Tea Industry)
Technical Specifications
Chain Grate Stokers
Technical Specification
Ghoogie
5. Sorting & Grading
‘Fibro’ Slow Speed Fibre Extractor
(Horizontal Design Vibratory Sifter & Grader for Tea)
Vibro Screen Sorter

(Vertical Design Vibratory Sifter & Grader for Tea)
Pulverizer
Powdering Machine for Tea
6. Packaging
Range of Packaging Machine (Menu Driven Computerized Pneumatically Controlled)
Vertical Form-Fill-Seal Machines
Pillow Pack FFS Machines for Granules
Technical Specification
Tea Bag Packaging Machine
Technical Specification
28. MACHINERY & EQUIPMENT FOR CTC TEA/TEA/ OOLONG TEA/ TEA BAGS

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.