

# Hand Book on Neem & Allied Products

**Author:** NIIR Board

**Format:** Paperback

**ISBN:** 8178330415

**Code:** NI49

**Pages:** 478

**Price:** Rs. 975.00 US\$ 25.95

**Publisher:** Asia Pacific Business Press Inc.

Usually ships within **5** days

Nature has blessed man with a number of wonders. Of all, plants are found to be its best boon. Among them, neem is distinguished by their astonishing versatility. Neem is such a fascinating tree that no other tree probably has provided wide range of benefits to mankind. Neem tree and its products have been reputed since long for some physiological activity and have been used quite extensively as a household remedy, since time immemorial, for the treatment of some of the common ailments. The Neem tree, which is also known as Margosa or Indian lilac is grown extensively in Asian and African countries. The neem is very useful tree due to its medicinal and insecticidal properties. Neem oil is the major product of neem seed industry. The chief limitation of the oil is its odour due to the presence of odouriferous substances and other non saponifiable components. Amongst the non edible oilseeds the potential availability of neem is by far the largest because of its very extensive growth throughout the country and fairly good yield of oils from the seeds. Neem seed cake is the major by product of neem seed oil. Various parts of the neem tree have been used as traditional Ayurvedic medicine in India. Almost every product of this invaluable tree has been largely employed for medical purposes. Neem works as blood purifier. Consuming raw neem leaves or neem leaf powder helps in eradicating toxins from the blood. This is one of the greatest benefits of neem tree. Azadirachtin in the neem products have been found to act as repellents, antifeedants, affect food consumption and utilization and interfere with the growth regulation and ovarian development in insects. Neem manufacturing products are in high demand and several manufacturing companies are readily in business trying to satisfy their natural product consuming and environment sensitive market. Along with a good natural resource management program, Neem can be an income generator and a sustainable medicinal alternative in developing countries.

Some of the fundamentals of the book are technology for production of insecticides of plant origin at rural level, neem seed cake as a source of pests control chemicals, neem oil as possible biorational insecticide, chemistry of neem (*azadirachta indica*), a sustainable source of natural pesticides, machineries for neem processing, engineering properties of neem nut, neem and transfer of technology, processing of neem fruit and seed, processing of neem oil and its utilization, uses of neem is indigenous system of medicine, cold processing of neem seed, products from neem, development of a neem formulation and its evaluation for control of crop pests, evaluation of nematocidal potential in neem, etc.

The book covers cultivation of neem and processing of its products. It will be of immense value to all concerned with manufacturing of neem products; consultants Institutions or those who want to diversify in to production of neem based products.

## Contents

1. Technology for Production of Insecticides of Plant Origin at Rural Level  
Materials and Methods

Results and Discussion

Use of leaf Bits

Use of Leaf Extracts

Impregnation of Bags with Kernel Extract

Surface Treatment of Bins

Vapour Effect of Extract/Oil

Technology for Rural Level

## 2. Neem seed cake as a Source of Pests Control Chemicals

Methods and Materials

Results and Discussion

## 3. Neem oil as Possible Biorational Insecticide

Materials and Methods

Results and Discussion

## 4. Improving the Productivity of Neem Trees

Distribution

Agroclimatic Adaptability

Establishment and Growth

Production and uses

Non-wood Products

Environmental Safety

Problems of Neem Production and Utilization

Propagation of Neem

Variation in Germplasm

Silvicultural Practices to Improve Productivity

Establishment of neem

Fruiting

Seed Collection and Processing

Promotion of Neem Production

Packaging of Silvicultural Practices

Popularising the Use of Neem Products

Marketing of the Produce

## 5. Vegetative Propagation of *Azadirachta indica* A. Juss.

Materials and Methods

Mist Propagation

Micropropagation

Results

Mist Propagation

Micropropagation

Discussion

## 6. An Assay of Genetic Variability through Phenological

Studies on Neem (*Azadirachta indica* A. Juss.)

Plantation

Materials and Methods

Observations and Discussions

## 7. Chemistry of Neem (*Azadirachta indica*), a Sustainable

Source of Natural Pesticides

## 8. Photo-oxidation of Tetranortriterpenoids

Materials and Methods

Results and Discussion

## 9. New Tetra and Pentanortriterpenoids from

*Azadirachta indica* A. Juss.

Results and Discussion

1 a-Destigloyl-1a-benzoylazadirachtin (II)

11b-Hydroxyazadirachtinin (III)

4a-benzoyl nimbandiol [V]

Ochinin Acetate [VII] and Ochinolide B [VIII]

## 10. Machineries for Neem Processing

Materials and Methods

Results and Discussion

Summary and conclusion

Suggestions for Further Work

## 11. Engineering Properties of Neem Nut

Introduction

Review of Literature

Materials and Methods

Apparatus and Procedure

Dimensions and Hardness

Nut weight and Kernel-shell Mass Ratio

Angle of Repose

Porosity

Bulk Density and Particle Density

Friction

Preparation of Samples

Results and Discussion

Dimensions and Hardness

Nut Weight and Kernel-Shell Mass Ratio

Angle of Repose and Porosity

Bulk Density and Particle Density

Coefficient of Friction

Conclusions

## 12. Neem and Transfer of Technology

Use of Neem Pest Control

Transfer of Neem Technology to the Farmers in India

As Pest Control Agent

On Tobacco

On-Farm Trial

Demonstration Trials

Lab-to Land Programme

NSKS in Integrated Pest Management

On Cotton

On Paddy

On Pulses

On Castor

Use of Neem Cake as Nematicide

Use of Neem Oil as a Suckericide on Tobacco

## Neem Cake as Organic Manure

### 13. Processing of Neem Fruit and Seed

Availability of neem

Collection and processing of fruit and seed

Depulpers, driers and decorticators

Driers

Decorticators

Discussion of Results

Maturity, storage and pressing of seed

Maturation of Oil in Stored Fruits

Depulping of The Neem Fruit

Cost of Operation

Crushing of Neem Seed Kernels in Wardha Ghani

Fall of Oil yield with Storage

Processing of Neem Seed Kernel and production of  
Neem Oil

Crushing

Storage Experiments on Neem Seed

Conclusions

Characteristics of neem oil and its quality

Specific Gravity and Refractive Index

Acid Value

Alcohol Soluble Material in the oil

Other Characteristics

Unsaponifiable Matter

### 14. Processing of Neem Oil and its Utilization

Quantitative estimation of the different constituents  
of neem oil by alcohol extraction

Total Dilute Alcohol Extractive of Neem Oil

Large Scale Alcohol Extraction of Neem Oil

Refining of alcohol-extracted oil

Alkali Treatment

Refining Loss on Alkali Treatment

Bleaching of Neutral oil (Alcohol-Extracted and  
Alkali-Refined)

Hydrogenation Experiments (Laboratory Scale) with  
Neutral and Bleached Neem Oil

Refining Loss in Factory Pilot Unit

Tentative Cost of the Process of Alcohol Extraction  
of Neem oil based on the Pilot Plant work

High Pressure Splitting

Deodorization and hydrogenation of purified and  
refined oil

Alkali Refining

Hydrogenation of Refined Neem Oil

Soap

Stearin and olein

Pyronimin, a denaturant

Pyronimis-A Denaturant for Alcohol

Production of the Denaturants

Requirement of the Denaturants

Results of tests with the denatured spirit  
Tentative Specifications for Pyronimin-250  
Tentative Specifications for 'Total Bitters' Fraction  
Tentative Specifications for the Spirit Denatured with  
Pyronimin and 'Total Bitters' on Neem  
Pharmaceutical Preparations with the Bitter Constituents  
Preparations from Nimbidin-T and their uses  
Costing  
Other Experiments at Refining  
Factors influencing industrial utilization of neem oil  
and its by-products

#### 15. Medicinal Uses

Uses of neem in indigenous system of medicine  
Medicinal Uses of Neem in Recent Times

#### 16. Cold Processing of Neem Seed

Experiment  
Seed Cleaning  
Mechanical Destoner  
Mechanical Sieve-shaker Separator Fitted with  
Air Cyclone System  
Sedimentation (Gravitational) Technique  
Decoration of Seed  
Crushing  
Discussion

#### 17. Products from Neem

Semi-greaseless cold cream  
Skin toning lotions  
Cream Cholesterin Type  
Herbal Soap (Neem based)  
Neem based tooth paste  
Radhas Ayurvedic Soap  
Arya Neem Plus Turmeric Herbal Soap  
Krishna Tulsi Herbal Soap  
Medimix Skin Care Capsule  
Shodha  
Alargin forte  
Beauty plus  
Dantshodhak  
Hemoclin syrup  
Epidermoil Oil  
Neem capsule  
Charmi capsules  
Hemocleen

#### 18. Repellent Action of Neem Oil on Insects of

Public Health Importance  
Methodology  
Results  
Discussion  
Conclusion

19. Effect of Neem Oil: Structural and Functional

Change in the Epididymis of Rats

Materials and Methods

Neem Oil

Animals

Sperm Motility and Sperm Count

Biochemical Estimations

Histological Investigation

Statistical Analysis

Results

Discussion

20. Rat Toxicity Studies with Neem Oil

Materials and Methods

Neem Oil

Animals

Biochemical Studies

Statistical Analysis

Results

Tissue Biochemical Parameters

Blood and Serum Parameters

Histological Studies

Discussion

21. Evaluation of Neem Extract Sprays on Maize

Introduction

Materials and Methods

Results

Discussion

22. Antifeedant and Insecticidal Activity of Some

Neem Fractions

Materials and Methods

Results and Discussion

23. *Azadirachta indica* A. Juss. Stem Bark as an

Anti-Leprosy Source

Materials and Methods

Observation and Results

Pharmacognosy

Macromorphology of Bark

Micromorphology of Bark

Powder Study

Phytochemistry

Biochemical Estimation (Percentage on Dry Weight Basis)

Geochemical Estimation

Active Principle Determination (from Ethanolic Extract)

Chemical Identity Comparison

Discussion

24. Evaluation of Neem Derivatives and *Lantana camara* L.  
against Cardamom Pests

## Materials and Methods

Field Evaluation of Neem Derivatives against the  
Cardamom Thrips, *Sciothrips cardamomi* (Ramk.)

Field Evaluation of Neem Oil against Cardamom  
Whitefly, *Dialeurodes cardamomi* David & Subr.

Laboratory Evaluation of the Crude Extract of Stem of  
Lantana camara against the Cardamom Hairy

Caterpillar, *Eupterots undata*

Laboratory Evaluation of the Crude Extract of the Stem of  
Lantana camara L. against Cardamom Shoot Borer,  
*Conogethes punctiferalis* (Guen.)

## Results and Discussion

Effect of Neem Derivatives on Cardamom Thrips

Effect of Neem Oil on Cardamom Whitefly

Effect of 1 per cent Suspension of the Extract of Lantana  
camara on *E. undata*

Effect of 1 per cent Suspension of the Extract of *L. camara*  
on *C. punctiferalis*

## 25. Development of a Neem Formulation and Its Evaluation for Control of Crop Pests

### Materials and Methods

#### Product Development

#### Laboratory Studies

#### Field Studies

### Results and Discussion

#### Laboratory Studies

#### Field Studies

## 26. Effect of Neem Cake, Neem Oil, Repelin and Carbofuran on Control of Soybean Nematodes

### Materials and Methods

### Results and Discussion

## 27. Thyroid Hormones and Intermediary Metabolism in Fish: Influence of Neem Kernel Extract

### Materials and Methods

### Results

Effect of T3 or T4 in Fish Injected with NKE

Effect of T3 and T4 in Fish Immersed in NKE-treated Water

### Discussion

## 28. Clinical Studies with Praneem Polyherbal Cream in Chlamydial Cervicitis

### Materials and Methods

#### Polyherbal Cream

#### Patients

Diagnostic Methods for *C. trachomatis*

#### Dose Schedule

#### Follow-up

### Results

### Discussion

29. Identification and Characterization of the Immunomodulator  
Fraction from Neem Seed Extract Responsible for  
Long-term Anti-fertility Activity  
Materials and Methods  
Results  
Conclusion

30. Identification of Effective and Inexpensive Neem  
(*Azadirachta indica* A. Juss.) Seed Kernel Extract  
Materials and Methods  
Seed Collection and Processing  
Extraction  
Aqueous Extract (AE)  
Ethanollic Extract (EtoHE)  
Hexane Extract (HE)  
Chloroform Extract of DNKP (CHEDK)  
Ethanol Soluble (Eto HSHE) and Insoluble (EtoHIHE)  
Part of Hexane Extract  
Extract Yield  
Formulation of the Extracts  
Rearing Culture of *H. armigera*  
Biological Testing  
Oviposition  
Ovicidal  
Feeding deterrent  
Growth and Development  
Results  
Effect on Oviposition  
Effect on Egg Hatching  
Effect on Feeding  
Effect on Growth and Development  
Pupal Mortality and Adult Emergence  
Discussion  
Effect of oviposition  
Effect on Egg Hatching  
Effect on Feeding  
Effect on Growth and Development of Larvae  
Conclusion

31. Field Evaluation of Some Botanical Insecticides Alone  
and in Combination with Other Insecticides for  
Management of Bollworm Complex on Cotton  
Materials and Methods  
Results and Discussion  
RD-9 Repelin  
Neemark  
Ind-Ne  
Conclusions

32. Evaluation of Enriched Neem (*Azadirachta indica* A. Juss.)  
Seed Extracts against Mango Hoppers, *Idioscopus*  
*nitidulus* Walker and *Amritodus atkinsoni* Leth.  
Materials and Methods



Laboratory Trial  
Field trials  
Results  
Laboratory trials  
Field Trials  
Evaluation of neem derivatives for control of mango  
hopper, *I. nitidulus*  
Discussion

### 33. Potential of Neem in Insect Pest Management in Rice

Introduction  
Materials and Methods  
Results and Discussion  
Effect of Neem Oil on Rice Leaf Folder and Stem Borer  
Efficacy of Neem-based Insecticides Against Stem Borer  
Effect of Neem-based Insecticides on the Growth  
and Development of White-backed Planthopper  
Combination of Neem-based Products with Synthetic  
Insecticides

### 34. Effect of Neem Kernel Extract and Neem Oil on Nutritive and Reproductive Physiology of *Heliothis armigera*

Hub.  
Materials and Methods  
Mass Culture and Biological Studies  
Preparation of Extracts  
Treatment  
Quantitative Food Utilization  
Efficiency of Digestion  
Reproduction Studies  
Biochemical Assays  
Enzyme Assays  
RESULTS  
Effects on Reproductive Parameters  
Effects on Quantitative Food Utilization  
Effects on Efficiency of Digestion and Digestive Enzymes  
Effect on Protein, Glycogen, Lipid and Enzyme Profiles  
in Subsequent Female Moths  
Effect on Protein, Glycogen, Lipid and Enzyme Profiles  
in Subsequent Male Moths  
Discussion  
Conclusion

### 35. Bioefficacy of Some Neem Formulations against *Spodoptera litura* F.

Materials and Methods  
Laboratory Tests  
Nursery Experiment  
Studies on Effect of Repelin B versus Repelin A and  
NSKS against *S. litura* on Castor in Laboratory  
Studies on Effect of Repelin B Alone and in Combination  
with Endosulfan against *S. litura* (1992)  
Bio-efficacy of Repelin B and Other New Neem

Formulations against *S. litura* on Tobacco (1992)  
Results and Discussion  
Laboratory Tests  
Nursery Experiments  
Effect of Repelin B versus Repelin A and NSKS against  
*S. litura* on Castor in Laboratory  
Choice Situations  
No-choice Situation  
Effect of Repelin B alone and in Combination with  
Endosulfan against Tobacco Caterpillar, *s. litura*  
on Tobacco  
Bio-efficacy of Repelin B and Other New Neem  
Formulations against *S. litura* (1992)  
Laboratory tests  
No-choice Situation  
Nursery Tests

### 36. Effects of Extracts from Neem on Aphids (Homoptera: Aphididae) and Their Natural Enemies

Materials and Methods  
Azadirachtin Content  
Aphid Control  
Aphid Natural Enemies  
Antifeedant Activity  
Aphid Reproduction  
Results and Discussion  
Aphid Control  
Aphid Natural Enemies  
Antifeedant Activity  
Aphid Growth and Development  
Aphid Reproduction  
Conclusion

### 37. Azadirachtin Content and Bioactivity of Some Neem

Ecotypes of India  
Materials  
Methods  
Estimation of Azadirachtin Content  
Kernels  
Oil  
Extraction and Enrichment  
Physicochemical Properties of Oil  
Azadirachtin Estimation by PHLC  
Insect Growth Regulation (IGR)  
Fungicidal Activity  
Results and Discussion  
Azadirachtin Content of Neem Ecotypes  
Kernels  
Oil  
Enrichment  
Insect Growth Regulation  
Fungicidal Property

38. The Effects of Various Neem Formulations on Mortality Rate and Morphogenetic Defects Upon *Schistocerca gregaria* (Forsk.) Larvae  
Materials and Methods  
Laboratory Insects  
Field Insects  
Neem Products  
Controls  
Application of the Larvae  
Application of the Vegetation  
Results  
Mortality Rates Following Application of Neem Products to Larvae  
Mortality Rates after Treatment of the Plants with Enriched Neem Oil; The Repellent Effect of Neem  
Morphogenetic Defects  
Discussion

39. Efficacy of Cakes in the Management of Root Knot Nematode (*M. arenaria*) in Groundnut  
Materials and Methods  
Results and Discussion

40. Efficacy Profile of a Commercial Neem Insecticide  
Factors Influencing the Commercial Success of Azadirachtin  
Consistency and Quality of Extracts  
Product Positioning  
Supply and Availability  
Increase in Environmental Awareness  
The Acceptance of Insect-Growth-Regulators  
Cost of Raw Material  
Important Commercial Characteristics of Azadirachtin  
Representative Efficacy Data with Azatin/Turplex/Align in the United States

41. Evaluation of Nematicidal Potential in Neem  
Allelochemicals  
Materials and Methods  
Results  
Discussion

Directory Section

## 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.

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](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Thu, 02 May 2024 22:45:05 +0530