

Cloves Production At A Glance



Prepared
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2026

TRAINING MANUAL ON CLOVE (*Syzygium aromaticum*) PRODUCTION

Target Audience

Farmers, extension agents, agricultural students, agripreneurs, and development practitioners.

Purpose of the Manual

This manual is designed to provide a **professional, step-by-step guide** to clove production, integrating **theoretical knowledge** with **hands-on practical activities** to ensure clear understanding and effective skill acquisition.

MODULE 1: INTRODUCTION TO CLOVE PRODUCTION

1.1 Learning Objectives

By the end of this module, participants should be able to:

- i. Understand the importance of cloves economically and medicinally
- ii. Identify major clove-producing regions
- iii. Explain the uses and market value of cloves



Fig 1: Cloves (Wet/Dry)

1.2 Theory

Clove (*Syzygium aromaticum*) is a perennial evergreen tree belonging to the family **Myrtaceae**. The dried unopened flower buds, known as cloves, are widely used as a spice, in traditional medicine, pharmaceuticals, cosmetics, and food processing industries. Cloves are highly valued due to their strong aroma, antiseptic properties, and export potential.

Major global producers include Indonesia, Madagascar, Tanzania, Sri Lanka, and India. With suitable agro-ecological conditions, clove production offers long-term income opportunities for farmers.

1.3 Practical Session

- Display fresh and dried clove buds for identification
- Group discussion on local and international uses of cloves
- Market survey exercise (prices, buyers, demand)

MODULE 2: BOTANY AND GROWTH REQUIREMENTS OF CLOVE

2.1 Learning Objectives

Participants should be able to:

- Describe the clove plant and its growth stages
- Identify suitable climatic and soil conditions

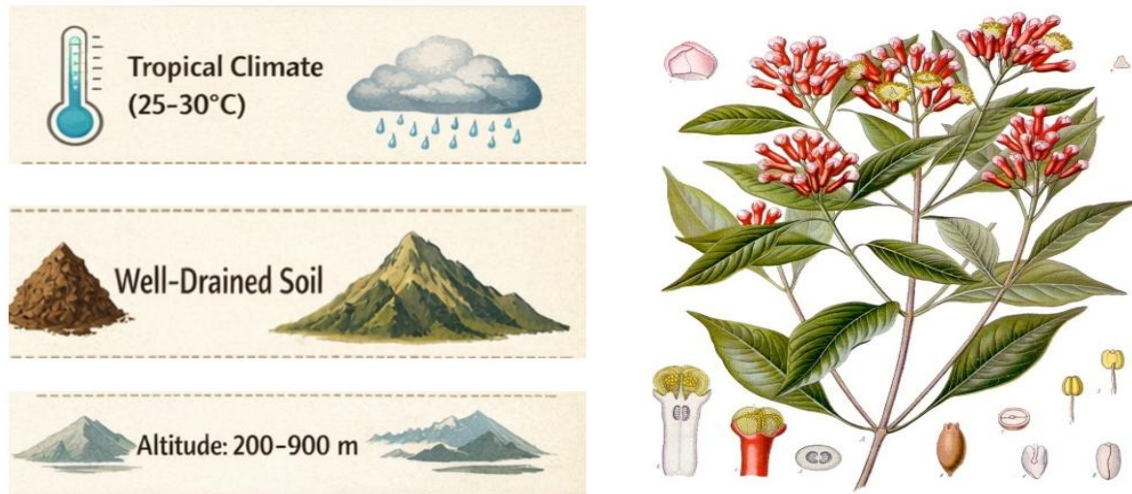


Fig 2: Growth requirement for cloves

2.2 Theory

Clove trees grow up to 10–15 m tall and start bearing flowers after 5–7 years. The plant thrives under:

- **Climate:** Warm humid tropical climate
- **Rainfall:** 1,500–2,500 mm annually, well distributed
- **Temperature:** 20–30°C
- **Soil:** Deep, well-drained loamy soils rich in organic matter
- **pH:** Slightly acidic to neutral (5.5–7.0)

2.3 Practical Session

- Field identification of suitable land
- Soil texture testing using hand-feel method
- Demonstration of soil pH testing

MODULE 3: SITE SELECTION AND LAND PREPARATION

3.1 Learning Objectives

- Select appropriate sites for clove farming
- Prepare land for planting



Fig 3: Site selection and Soil preparation

3.2 Theory

Proper site selection is critical for long-term productivity. The site should have good drainage, gentle slope, and protection from strong winds. Land preparation involves clearing, stumping, ploughing (where applicable), and pegging planting positions.

3.3 Practical Session

- Land inspection and slope assessment
- Pegging and spacing demonstration (6 m × 6 m or 7 m × 7 m)
- Digging planting holes (60 × 60 × 60 cm)

MODULE 4: NURSERY MANAGEMENT AND PROPAGATION

4.1 Learning Objectives

- Establish and manage a clove nursery
- Apply proper seed selection and sowing techniques

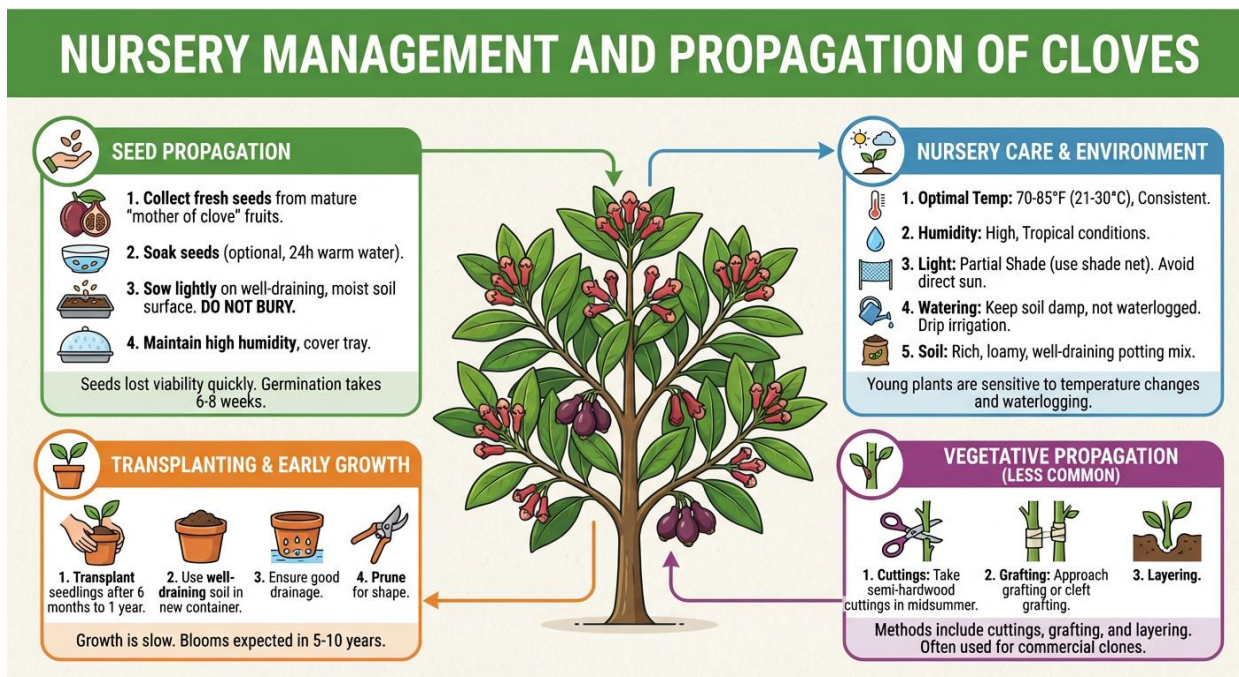


Fig 4: Nursery management and seed propagation

4.2 Theory

Cloves are propagated mainly by seeds. Seeds must be fresh, viable, and sourced from healthy mother trees. Nursery practices include shade provision, regular watering, and pest control. Seedlings are ready for transplanting after 18–24 months.

4.3 Practical Session

- Selection of viable clove seeds
- Nursery bed or polybag preparation
- Seed sowing and watering techniques
- Seedling care and grading

MODULE 5: TRANSPLANTING AND FIELD ESTABLISHMENT

5.1 Learning Objectives

- Transplant seedlings correctly
- Establish healthy clove plantations



Fig 5: Transplanting

5.2 Theory

Transplanting should be done at the onset of the rainy season to reduce moisture stress. Seedlings should be handled carefully to avoid root damage. Mulching and temporary shade improve survival rates.

5.3 Practical Session

- Correct seedling removal from nursery
- Planting depth demonstration
- Mulching using organic materials
- Installation of temporary shade

MODULE 6: FIELD MANAGEMENT PRACTICES

6.1 Learning Objectives

- Apply good agronomic practices for optimum growth

6.2 Theory

Key management practices include:

- **Weeding Intervals**

- i. Young plantations (0-3yrs), Frequency (6-8wks).
- ii. Matured plantations (4+yrs), Frequency (Every 3-4mnths)

Methods: Manual hoeing or slashing, avoid deep hoeing to prevent root damage.

- **Fertilizer Requirement**

- i. Application of organic manure at 5-10kg/tree annually
- ii. Application of inorganic fertilizer NPK (15:15:15) at 100g, 200g, and 300g for year 1, 2, and 3 respectively. UREA 100-200g/tree to boost vegetative growth.

- **Mulching:** Conserves moisture and improves soil fertility

- i. Thickness 8-10cm at a radius of 1-1.5m around the tree base.
- ii. Keep mulch 15-20cm away from stem to prevent rot.

- **Pruning:** Removal of dead or diseased branches.

- i. Frequency: Once or twice per year.

6.3 Practical Session

- Fertilizer application methods
- Mulching and pruning demonstrations
- Growth monitoring and record keeping

MODULE 7: PEST AND DISEASE MANAGEMENT

7.1 Learning Objectives

- Identify major pests and diseases
- Apply integrated pest management strategies



7.2 Theory

Common challenges include stem borers, leaf miners, fungal leaf spots, and root rot. Integrated Pest Management (IPM) combining cultural, biological, and chemical control is recommended.

7.3 Practical Session

- Identification of pest and disease symptoms
- Preparation and safe application of control measures
- Demonstration of sanitation practices

MODULE 8: HARVESTING AND POST-HARVEST HANDLING

8.1 Learning Objectives

- Harvest cloves at the correct stage
- Apply proper drying and storage methods



8.2 Theory

Cloves are harvested when flower buds turn from green to pink but before opening. Harvesting is usually done by hand. Proper drying reduces moisture to about 10–12% to maintain quality.

8.3 Practical Session

- Identification of mature buds
- Harvesting techniques using hands or tools
- Sun-drying and moisture assessment
- Packaging and storage demonstration

MODULE 9: MARKETING, VALUE ADDITION AND RECORD KEEPING

9.1 Learning Objectives

- Understand clove marketing channels
- Practice basic farm record keeping

9.2 Theory

Cloves can be sold fresh or dried. Value addition includes grinding, oil extraction, and packaging. Record keeping enhances profitability and access to credit.

9.3 Practical Session

- Simple cost–benefit analysis exercise
- Market linkage discussions
- Farm record book preparation

MODULE 10: HEALTH, SAFETY AND ENVIRONMENTAL CONSIDERATIONS

10.1 Learning Objectives

- Apply safe agricultural practices
- Promote environmental sustainability

10.2 Theory

Farmers should use protective equipment, handle agrochemical safely, and adopt climate-smart practices such as mulching and agroforestry.

10.3 Practical Session

- Demonstration of personal protective equipment (PPE)
- Waste disposal and environmental conservation practices

CONCLUSION

This training manual provides a comprehensive guide to clove production by combining **sound theoretical foundations** with **practical, field-based learning activities**. When properly applied, the practices outlined will enhance productivity, quality, and profitability of clove farming.

Suggested Training Approach

- Interactive lectures
- Demonstrations and field practicals
- Group discussions and problem-solving exercises
- Field visits and hands-on practice

Prepared for professional agricultural training and extension purposes.