Unit 2: Fruit Crops Production and Management

Key Terms in Fruit Production

1. **Fruit Crop**: A perennial, edible plant grown for its true botanical fruit or related products.
2. **Fruit Set**: The process of an ovary developing and persisting after flowering.
3. **Orchard**: A designated area for growing fruit crops.
4. **Asexual Propagation**: Reproduction using vegetative parts without fertilization, producing genetically identical plants.
5. **Chilling Injury**: Damage from prolonged exposure to cool, non-freezing temperatures, affecting tropical fruits with symptoms like discoloration and breakdown.
6. **Chilling Requirement**: The necessary exposure to cool temperatures for proper bud development in spring.

Importance, Problems, and Potential of Fruit Crops in Ethiopia

Importance:

- Fruits provide energy, nutrients, and vitamins.
- They enhance household food security and income.
- Fruits can be exported, contributing to foreign currency earnings.
- Fruit production supports environmental conservation and boosts the national economy through agro-processing industries.

Problems:

- Fruit production is relatively new in Ethiopia, with many recent introductions.
- Technical knowledge and management skills are often lacking.
- Limited fruit production in highland areas and challenges in local market development.

Potential:

- Ethiopia's diverse agro-ecologies, water resources, and proximity to Middle Eastern and European markets offer significant opportunities.
- Government policies aim to improve fruit production and its economic impact.

Classification of Fruit Crops

1. **By Structure**:
    - **Simple Fruits**: Develop from a single ovary. Examples: apple, grape.
    - **Aggregate Fruits**: Formed from multiple ovaries in one flower. Example: strawberry.
    - **Multiple Fruits**: Formed from the ovaries of several flowers. Example: pineapple.
2. **By Temperature Requirement**:
    - **Tropical Fruits**: Grow in year-round warm climates. Examples: banana, mango.
    - **Sub-tropical Fruits**: Require some winter chilling. Examples: citrus, figs.
    - **Temperate Fruits**: Need cold winters and warm summers. Examples: apple, peach.
3. **By Ripening Response**:
    - **Climacteric Fruits**: Ripen with increased respiration and ethylene production. Examples: tomato, apple.
    - **Non-Climacteric Fruits**: Ripen without the ethylene-associated peak. Examples: grape, orange.
4. **By Plant Characteristics**:
    - **Tree Fruits**: Grown on trees. Examples: mango, apple.
    - **Small Fruits**: Grown on shrubs. Examples: blueberry, raspberry.

Principles and Techniques of Fruit Propagation

1. **Sexual Propagation**:
    - Involves growing plants from seeds. Seeds include an outer coat, endosperm, and embryo. Pre-sowing treatments may be needed to overcome seed dormancy.

    Advantages:

    - Cost-effective.
    - Produces hardy plants.
    - Useful for crops difficult to propagate vegetatively.

    Disadvantages:

    - Takes longer to fruit.
    - Quality may not improve.
2. **Asexual Propagation**:
    - Uses parts of plants like stems or roots to grow new plants identical to the parent.
    - **Cuttings**: Sections of plants are used to grow new plants.

- **Air Layering**: Roots are induced to form on a part of a plant while it is still attached.
- **Grafting**: Joins two plant parts to grow as a single plant. Key components: stock (root system) and scion (upper part). Proper care and conditions are essential for success.

Advantages:

- Produces plants identical to the parent.
- Useful for plants where seeds are not viable or desirable.

Disadvantages:

- Requires specific techniques and care.
- Can be more complex than seed propagation.

Establishing a Nursery and Orchard Management

1. Establishing a Nursery

A nursery is a specialized area where young plants are nurtured until they are ready for transplantation. Here's how to set up a successful nursery:

- **Purpose:** To provide ideal conditions for young plants' growth, protecting them from extreme weather, pests, and diseases.
- **Site Selection:** Choose a site that is:
  - On a gentle slope for proper drainage.
  - Near a reliable water source.
  - Sheltered from strong winds, or with a windbreak.
  - Well-drained and fertile.
  - Away from flooding and shade from trees or buildings.
  - Close to the main field for easy transfer.
  - Accessible with a dependable labor supply.
- **Seedling Care:** Seedlings can be grown in nursery beds or polythene bags. Polythene bags are often better as they minimize root disturbance and reduce labor for weeding and watering.
- **Management:** Use high-quality planting material. Discard seedlings with twisted or poorly developed roots. Only transplant seedlings with straight stems and roots.

2. Orchard Management

An orchard is a dedicated area for growing fruit trees. Successful orchard management involves:

- **Site Preparation:** Choose a site that supports fruit tree growth, considering factors like soil fertility and water availability. Prepare holes for planting, ensuring they are appropriately sized and filled with a mixture of topsoil and organic matter.
- **Planting Distance:** Determine spacing based on the type and variety of fruit crop. Larger trees like mangoes need more space than smaller ones like papayas.
- **Irrigation:** Choose the right irrigation method based on water availability and soil type:
    - **Surface Irrigation:** Simple and low-cost but less efficient in high infiltration soils.
    - **Sprinkler Irrigation:** Suitable for non-level fields and high infiltration soils but costly and requires power.
    - **Drip Irrigation:** Water is delivered directly to the root zone, saving water and maintaining moisture but has high maintenance costs.

3. Harvesting and Post-Harvest

- **Harvesting:** Harvest fruits at the right maturity stage for optimal quality and shelf life.
- **Post-Harvest Handling:**
    - **Pre-Cooling:** Essential for long-term storage.
    - **Sorting and Grading:** Organize fruits by size and quality.
    - **Packaging:** Use materials that reduce moisture loss.
    - **Storage:** Keep fruits clean and stored at optimal temperatures and humidity levels.
    - **Transportation:** Handle fruits carefully to avoid mechanical damage.

4. Floriculture

Floriculture involves growing flowering and decorative plants. Key points include:

- **Importance:** Enhances aesthetics, offers economic benefits, and creates job opportunities.
- **Opportunities in Ethiopia:** Favorable climate, resources, and market proximity support floriculture growth.
- **Popular Flowers:** Roses, lilies, carnations, and others.

Summary:

- **Fruits** are valuable for nutrition and economic benefits.
- **Fruit production** contributes to food security and the economy.
- **Ethiopia** has great potential for fruit production with diverse climates and resources.

- **Nursery and orchard management** are crucial for successful fruit farming, requiring careful planning and management.