COCOA (*Theobroma cacao,* Linn.)

Cocoa Plant And Its Distribution

❖ Cocoa has currently been reclassified as a member of *Malvaceae* instead of *Sterculiaceae* families. Cultivated in the tropical and subtropical regions.

Introductions Of Cocoa Plantations

❖ The Spaniards, Dutch, and Portuguese introduced cocoa to their overseas territories.

❖ Cocoa got to West African peasant farmers through:

❖ Trading companies

❖ Missionaries

❖ Soldiers

❖ Chiefs

Cultivated Species Of Cocoa

The **Criollo,** The **Amazonian forastero** and The **Trinitario**

❖ **The Criollo group:**

❖ Cultivated in Venezuela, Nicaragua, Mexico, Colombia and Guatemala.

❖ Most anciently cultivated.

❖ Poor cacao vigour.

❖ **The Amazonian Forastero Group**

➢ Cultivated in Brazil, West Africa, Central America, South East Asia and Caribbean Island.

➢ Staminodes with purple pigments.

➢ Green and varying shapes of cocoa pods.

➢ Thick pericarp and very woody mesocarp.

• **The Trinitario Group**

➢ Believed to evolve from a cross between Forastero and Criollo groups.

➢ Highly heterogeneous group.

➢ Selected from Trinidad, hence the name Trinitario.

Botany And Agronomy of Cocoa

❖ Cocoa is cauliflorous and semi-desidous.

❖ Height, leaf area, branches and canopy spread of cacao determined by planting spacing.

❖ When grown from seeds cacao attains anthesis between 24 and 36 MAT and fully matured at about 10 YAT.

❖ A well managed cocoa continue to be economic for over 50 years.

❖ Within 36 hours after pollination, fertilization occurs leading to the formation of a young okra-sized pod – **cherelle.**

❖ Cherelle continues to develop by longitudinal elongation and girth increase to become a fully-grown mature cocoa pod.

Site Selection

❖ 2 major factors must be considered while selecting a site for cocoa plantations establishment: **climatic and soil factors**.

❖ Climatic factors:

➢ Cocoa is a low altitude crop, performing best within 100 – 300m above sea level (asl). It can be grown at 700m asl.

➢ Cocoa is sensitive to water deficiency particularly when in competition with other plants (shade plants, wind breaks and weeds) and also to excess water in the soil.

➢ It thrives within wide rainfall ranges of 1000 – 3000mm or more per year.

Soil Factors

The soil on which cocoa will be planted should satisfy the following conditions:

➢ The soil must be at least 1.5 m deep.

➢ The soil structure must be as homogenous as possible.

➢ It must have good water-retaining capacity, well-drained and well aerated.

Raising cocoa seedlings in the nursery.

❖ Cocoa beans readily germinate when sown and lose viability easily on extraction from pods within 5 – t days unless specially treated with moist fine sand or sawdust. They retain viability for 4 weeks inside pod after harvesting.

❖ Nursery establishment is done between December and February, in order to allow the seedlings a period of 4 months under intensive care.

Land Preparation For Transplanting Of Cocoa Seedlings Into The Field.

❖ In preparing the land for cocoa transplanting, some trees are left unfelled to act as windbreaks (upper storey).

❖ The field should have been planted to a temporary shade of plantain suckers the previous year or simultaneously with cocoa seedlings (middle storey) at same planting density with cocoa (100% shade density).

Vegetative / Clonal Propagation in Cocoa

❖ Conventionally, cocoa is clonally propagated through budding, grafting, cutting, marcutting (air layering) and soil layering. Cutting being the most popular method.

Cocoa Disease Pest

❖ **Black pod / Phytophtora pod rot:**

➢ Most serious disease of cocoa in West Africa, especially, Nigeria and Cameroon.

➢ Caused by ***Phytophtora megakarya***, during the rainy season when the **relative humidity is higher than 80%.**

- **Control of Phytophtora pod rot**

❖ The incidence of the disease is preferably prevented in the cocoa plantation through:

➢ Frequent removal of weeds / other plants that can increase the relative humidity of the plantation.

➢ Removal and burning of the infected cocoa pods.

➢ Application of the copper-based fungicides to control the incidence.

➢ The use of resistant / tolerant varieties.

- **Swollen shoot**

❖ A viral disease which may not appear till 6 months after cacao is infected.

❖ Symptom appears at the shoots produced after infection.

Control measures:

➢ Removal and burning of the infected cacao

➢ Breeding programme has put the disease under check through the introduction of the resistant / varieties.

- **Cherelle wilt**

❖ This is a physiological problem affecting only cherelles – 10cm long or less.

❖ The cherelles suddenly wilt and die. Dead cherelles are seen hanging on cacao.

❖ It results in 40 – 50% loss of the total pod set.

Charcoal Rot:

❖ This is a fungal disease caused by *Botryodiplodia theobromae.*

❖ It is a weak pathogen. It only infects wounded, overripe or weakened cocoa pods.

- **Major insect pests of cocoa**

Cocoa Mirids (Capsids or Jori-jori):

❖ Most serious insect pest of cocoa in West Africa.

❖ The insects attack both young and mature cacao.

Mealy bugs

❖ Mealy bugs are vectors of viral disease especially swollen shoot.

❖ Control methods:

➢ **Chemical control method**

- **Biological control method**

- **Harvesting and post-harvest handling of cocoa**

❖ It takes 150 – 180 days between pollination and ripening in cocoa, depending on varieties.

❖ Only mature and ripe pods are harvested, diseased and damaged pods must not be processed for markets.

Breaking / opening of cocoa pods:

❖ Use a blunt object such as a stone or a thick piece of wood for the breaking. Extracted beans with mucilaginous pulp are collected in a clean container for fermentation.

- **Preparation of Commercial Cocoa**
- In order to be sold as cocoa beans, the fresh cocoa removed from pods have to undergo two very important processes –
- **Fermentation**
  - **Heap fermentation**
  - **Basket fermentation**
  - **Sweat box fermentation**
  - **Tray fermentation**
- **Drying**

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- **Methods of drying.**
- Sun-drying
- Drying autobus
- Movable roof dryer.
- Simple dryers
- Mechanical dryers
- Automated workshops.

- **Grading of cocoa.**

– Grade 1 cocoa
– Grade 2 cocoa

- **Cleaning and bagging of cocoa.**
- **Storage of commercial cocoa.**

– The international standards stipulate the following conditions.
– The ambient humidity must not exceed 70 %.
– Periodic checking of the moisture content of each lots must be carried out.

Economic Importance of Cocoa.

- Beverages (not tea)
- Foreign exchange earnings.
- Black soaps
- Herbs
- Chocolates