

## 5<sup>th</sup> SEMESTER

### OPTION-I

#### SC516DA SERICULTURE - SILKWORM SEED TECHNOLOGY

(Credits: Theory-04, Practical-02)

#### THEORY

##### **UNIT- I: PRINCIPLES OF SEED TECHNOLOGY**

1. Silkworm seed, production, demand trends and seed legislation Act.
2. Seed areas –identification of selected seed rearers/villages.
3. Seed organization : Maintenance of parental stock and multiplication
4. Disinfection and maintenance of hygiene in seed production.
5. Seed cocoon markets.

##### **UNIT-II: GRAINAGE EQUIPMENTS AND MANAGEMENT:**

1. Grainages: Plan of model grainages—infrastructure, cold storage, facility and equipment, maintenance of grainage conditions.
2. Grainage management: Staff component, labour maintenance of grainage good cocoons, laying ration.
3. Distribution of eggs: precautions and preventive measures
4. Protective measure and maintenance of records in grainage.

##### **UNIT-III: SEED PRODUCTION:**

1. Eclosion of moths: Synchronization of emergence of moth, collection and selection, coupling, decoupling and storage of male moth.
2. Egg laying: Ideal condition for egg laying, methods of egg laying, disinfection of eggs and packing of egg cards.
3. Sheet egg and loose egg preparation
4. Mother moth examination for disease infection: Types of examination, green moth and dry moth examination, individual and mass examination.

##### **UNIT-IV: HANDLING AND PRESERVATION OF EGGS**

1. Handling of bivoltine eggs: Physical and chemical methods for early hatching hot and cold acid treatments.
2. Advantages and disadvantages of hot and cold acid treatments.
3. Hibernation schedules
4. Handling of multivoltine eggs: Preservation, ideal embryonic stages for cold storage, duration of cold storing..

## **PRACTICALS**

- a) Plan of grainage building and grainage equipment—Visit to the commercial grainage, visit to the seed cocoon markets, commercial, multivoltine and bivoltine.
- b) Processing of seed cocoons – deflossing—sorting—selection of good cocoons, assessment of seed cocoons—pupal examination.
- c) Cutting of seed cocoons—Sex separation by pupal method—preservation of cocoon/pupa, maintenance of temperature, humidity and light factors.
- d) Emergence of moths—Selection of moths—pairing and depairing. Oviposition, preservation of male moths.
- e) Mother moth examination—Individual and mass, whole and sampling method surface sterilization of silkworm eggs.
- f) Sheet eggs and loose egg preparation—Preparation of starch coated paper, washing of loose eggs, Drying-Treatment of eggs with acid-Weighing and packing. g) Acid treatment of bivoltine eggs. Hot and cold acid treatments.
- h) Dissection of silkworm eggs of different stages—Staining method

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### OPTION – II

#### SC516DB SERICULTURE - SILKWORM SEED MANAGEMENT

(Credits: Theory -04, Practical-02)

##### Unit- I: Introduction

6. Seed organization: Parental stock maintenance and multiplication. Types of seeds.
7. Silkworm Seed areas: Norms for seed areas and selected seed cocoon growers.
8. National Silkworm Seed Project and Seed Legislation Act.
9. Seed cocoon markets and norms for marketing.

##### Unit-II: Seed Production Management

5. Grainages: Introduction to grainages and their types
6. Plan of model grainages: Infrastructure, cold storage and facility
7. Grainage equipments.
8. Distribution of eggs: precautions and preventive measures

##### Unit-III: Grainage Operations-I

5. Selection of seed cocoons. Processes for selection of seed cocoons
6. Sex separation: Definition and methods
7. Eclosion of moths: Synchronization of emergence of moth, collection and selection, coupling, decoupling and storage of male moth.
8. Oviposition: Methods –sheet egg and loose egg preparation.

##### Unit-IV: Grainage Operations-II

5. Mother moth examination: Types and precautions during moth examination
6. Acid treatment of bivoltine eggs: Hot and cold acid treatments, advantages and disadvantages
7. Acid treatment after chilling and Hibernation schedules
8. Embryonic development: Study of various sages during embryonic development.

## **PRACTICALS**

- a) Study of grainage equipments
- b) Deflossing, cocoon sorting.
- c) Sex separation by pupal method.
- d) Emergence of moths—Selection of moths—pairing and depairing. Oviposition, preservation of male moths.
- e) Pupal gut examination and Mother moth examination—Individual and mass, whole and sampling method, and surface sterilization of silkworm eggs.
- f) Sheet eggs and loose egg preparation process.
- g) Acid treatment of bivoltine eggs. Hot acid treatment and cold acid treatments.
- h) Dissection of silkworm eggs of different stages—staining method.
- i) Visit to the commercial grainage, cocoon markets and reeling units of various state and Centre Govt.

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### OPTION - III

#### SC516C SERICULTURE - SILKWORM SEED AND GRAINAGE TECHNOLOGY

(Credits: Theory -04, Practical-02)

##### **Unit- I: Introduction to Seed Technology**

10. Morphology of Silkworm egg.
11. Embryology of silkworm egg and various stages of development
12. Silkworm seed: Types, production and demand trends
13. Seed areas: Norms for seed areas and selected seed cocoon growers.

##### **Unit-II: Seed Organization**

1. Seed organization : Introduction to parental stock maintenance and multiplication
2. Seed areas –identification of selected seed rearers/villages.
3. Maintenance of hygiene and disinfection in seed production centres.
4. Seed cocoon markets and seed legislation Act. Norms for marketing.

##### **Unit-III: Grainage management**

9. Introduction to grainages: Plan of model grainages and equipments
10. Types of grainages.
11. Grainage management: Staff component, labour maintenance of grainage good cocoons, laying ration.
12. Distribution of eggs: precautions and preventive measures

##### **Unit-III: Seed production in Grainages**

9. Eclosion and oviposition of moths: Synchronization of emergence, card egg and loose egg preparation techniques.
10. Mother moth examination for disease infection: Types of examination, green moth and dry moth examination, individual and mass examination.
11. Acid treatment of bivoltine eggs: hot and cold acid treatments. Advantages and disadvantages
12. Hibernation schedules for egg preservation

## **PRACTICALS**

- a) Study of morphology of silkworm egg
- b) Study of various grainage equipments—Visit to the commercial grainage, visit to the seed cocoon markets, commercial, multivoltine and bivoltine.
- c) Demonstration of Cocoon sorting.
- d) Sex separation by pupal method
- e) Moth eclosion-pairing and depairing. Pupal gut and Mother moth examination—  
Individual and mass, whole and sampling method
- f) Oviposition, preservation of male moths. Sheet eggs and loose egg preparation methods.
- g) Dissection of silkworm eggs of different stages—Staining method
- h) Acid treatment of bivoltine eggs. Hot acid and cold acid treatments