ST.JOSEPH'S COLLEGE FOR WOMEN(A), VISAKHAPATNAM

ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE: VIII-B
VI SEMESTER
SERICULTURE

OBJECTIVE :

1. To acquire knowledge & importance of sericulture.
2. To gain knowledge about species of silk moth & present position of sericulture in India.
3. To create awareness on composition and uses of silk.

Cluster Elective Paper: VIII-B-1

GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Marks 100

Unit - I : Introduction

1. Definition, history and present status of Sericulture
2. Types of silk worms and their food plants
3. Prospects of Sericulture in India - Sericulture industry in different states, employment, potential in mulberry and non mulberry Sericulture.

Unit - II : Morphology of mulberry plant

1. Common varieties of mulberry used in India
2. Characters of root, stem and leaf
3. Anatomy of root, stem and leaf
.4. Male and female reproductive organs, pollination, fertilization, development of seed.

Unit - III : Requirements for mulberry cultivation

1. Physical and chemical properties of soil and its nature
2. Soil moisture and water requirements
3. Climatic conditions - Temperature, photoperiod, humidity and rain fall

Unit - IV : Mulberry management

1. Land preparation - leveling and ploughing
2. Irrigation - drip, sprinkler or flood irrigation, weeding
3.Manuring - organic, inorganic and biofertilizers
4. Harvesting - leaf picking, shoot-leaf harvesting, branch cutting, leaf storage

Unit - V : Diseases and pests of mulberry

1. Fungal and bacterial diseases - Powdery mildew, red rust and leaf spot caused by fungi
Mulberry wilt caused by bacteria
Symptoms; mechanical and chemical control

2 .Nematode and mycoplasm diseases - Mulberry root-knot and mulberry root rot (nematode diseases),Mycoplasm and viral mulberry disease, Symptoms; mechanical and chemical control

3. Caterpillars - Bihar hairy caterpillar, semilooper
Bugs - Leaf hoppers and scale insects
Beetles - Girdle beetle, powder pest beetle

Cluster Elective Paper: VIII-B-2

BIOLOGY OF MULBERRY SILK WORM AND SILKWORM REARING TECHNOLOGY

Marks: 100

Unit - I : Morphology of silk worm

1. Egg - External and internal morphology and colour changes
2. Larva - Mouth parts, legs, prolegs, spiracles, eyes, claspers, integumentary hair and sexual markings
3. Pupa – Male and female morphology and sexual dimorphism
4. Adult – Mouth parts, antennae, wings and external genitalia

Unit - II : Anatomy and physiology of Mulberry silk worm

1. Digestive system of larva - Structure and physiology of digestion
2 .Silk glands of larva – Structure, development and mechanism of silk synthesis
3. Circulatory system of larva – Blood vessel, haemolymph and cells
4. Reproductive system of adult – Mechanism of egg development
5. Endocrine glands in larva and pupa, their secretions and hormonal control on development
6. Roll of pheromone in mating

Unit - III : Silk worm rearing house and appliances

1. Construction of ideal rearing house (CSB model)
2. Early age rearing appliances
3. Late age rearing appliances – Trays, ant wells, stands and racks, paraffin wax papers, rubber foam pads, nets, chopsticks and feathers
4 .Mountages – Bamboo, plastic, nylon, balances (digital)

Unit - IV : Disinfection and feeding appliances and silk worm technology

1. Disinfection of ants, appliances
2. Disinfectant appliances – Sprayers and dusters
3. Feeding appliances – Leaf chamber, chopping knife, chopping board
4. Humidity and temperature measuring devices
5. Commercial races – Multivoltine, bivoltine, monovolatine and hybrid races
6. Seed collection, cards, loose eggs, incubation, hatching, brushing, rearing of early instars, rearing of late instars
7.. Mounting and cocoon production
8. Harvesting and storage of cocoons

Unit - V : Diseases of silk worms and their management

1. Viral diseases – Nuclear polyhydrosis disease, infectious flacherie viral disease (symptoms, prevention, control and management)
2. Protozoan disease – Pebrine disease (symptoms, prevention, control and management)
3. Bacterial diseases – Septicemia,Toxicosis (symptoms, prevention, control and management)
4. Fungal diseases – Muscardine disease, aspergillosis (symptoms, prevention, control and management)
5. Pests – Tachinid fly, dermistid beetle (damage, control measures)

Cluster Elective Paper: VIII-B-3

SILK TECHNOLOGY, SILK MARKETING AND EXTENSION

Hours 60 Marks 100

Unit - I : Cocoons

1.Quality of cocoon, cocoon shell ratio, silk filament length, cocoon reelability and factors effecting reelability

2.Physical and chemical properties of fibre

3.Cocoon drying – Conventional and modern techniques

4.Cocoon sorting and preservation

5.Cocoon cooking

Unit - II : Reeling, silk throwing and weaving

1. Reeling appliances – Conventional and modern

.2. Reeling operations

3.Rereeling

4. Raw silk testing and grading

5. Silk throwing and twisting

.6. Silk weaving

7. Chemical processing of silk yarn and fabrics

Unit - III : Sericulture and management

.1 Sericulture organisation at state and national levels – Development, research, training and policies

.2. Role of national silk worm seed organisation in grainage

3. Sericulture services network – Basic seed facility, seed areas, grainages, nurseries, central research centers (CRCs), filature, silk exchanges and cocoon certification centers

.4..Project formulation and role of credit co-operative and financing agencies in sericulture – NAARD, IDBI, Banks, IRDP etc.

Unit - IV: Marketing organizations, Cocoon and Yarn marketing

1 Sericulture marketing organisation for seed cocoon, raw silk and silk fabric

2 Traditional and regulated markets, their merits and limitations

3 Government intervention – Legislation and implication in marketing

4 Marketing institutions – Marketing boards, co-operatives and stabilization of price

Unit - V : Cocoon and Yarn marketing

1 .Cocoon marketing – Gradation of seed and reeling cocoons, marketing of multivoltine, bivoltine and hybrid cocoons

.2. Yarn marketing – Gradation of yarn, twisted and untwisted yarn

3. Feedback system – Surveys and types, merits and limitations

4. Silk export – Challenges and growth prospects

SUGGESTED READING

1. Text book of tropical sericulture. Publ., Japan Overseas Corporation volunteers – 1975
2. Silkworm rearing techniques in the tropics, Dr. S. Omura, Japan International Cooperation Agency – 1980
3. The natures and property of soils (9^{th} edition) N.C. Brady (Mac Millan Pub. Co. Inc., New York)
4. Studies on soils of India, S.V. GovindRajan and H.G. GopalaRao (1970), Vikas Pub. House Pvt. Ltd., New Delhi
5. Manual on sericulture – Food and Agriculture Organisation, Rome – 1976
6. Handbook of practical sericulture : S.R. Ullal and M.N. Narasimhanna CSB, Bangalore – 1987
7. A guide for bivoltine sericulture – K. Sengupta, Director, CSR & TI, Mysore – 1989
8. Economics of sericulture under irrigated conditions : M.S. Jolly, CSR & TI, Mysore – 1982
9. China sericulture, 1972, FAO, Rome
10. Mulberry cultivation (Vol. I) written by Zheng Ting – Xing, Tan Yun – Fang, Huang Guang – Xian and Ma ben. Published by Oxford and IBH publishing Co. Pvt. Ltd., New Delhi, Bombay, Calcutta
11. Silk egg production (Vol. III) written by Wang Sang – Ming published by Oxford and IBH publishing Co. Pvt. Ltd., New Delhi, Bombay, Calcutta
12. Economics of silk industry, RC Rawlley, PS king and Sons ltd., London
13. Silk production processing and marketing – MM Nanavaty, VS Johari, Wiley Estern ltd., Ansari Road, New Delhi
14. Principles of sericulture – HisaoAruga, Mohan Primlani for Oxford and IBH publishing co., Pvt., Ltd., New Delhi

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