



Department of Zoology

Value Added Course

2021-2022

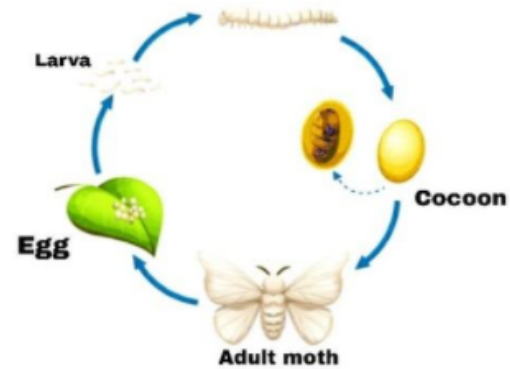
Title: General Sericulture mulberry Cultivation & Management

Sericulture

Duration of Course : 30 Days

Course Code: VACZOO-05

Date: 22/03/2022 -14/05/2022



A.G. & S.G. Siddhartha Degree College of Arts & Science Vuyyuru
Krishna District, Andhra Pradesh

(An Autonomous College in the Jurisdiction of Krishna University)

Accredited by NAAC with "A" Grade

ISO 9001:2015 Certified Institution

Value Added Course 2021-2022



DEPARTMENT OF ZOOLOGY

Value Added Course

Title: GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Name of the Lecturer	:	D.A.Kiranmayee
Class	:	III B.Sc. BZC (TM & EM)
Duration of the Course	:	30 Days (22. 03.22 – 14.05 22)
VAC Code	:	VACZOO 05

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course

Title: GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Objectives:

- Motivating the farmers to plant high yielding mulberry varieties to increase income and productivity.
- Imparting training in mulberry cultivation, silkworm rearing and silk reeling.
- Assist in procurement of improved rearing equipment and construction of separate rearing house.
- Ensure supply of disease-free silkworm seeds.
- Enhance skill of farmers for increased cocoon productivity and to prevent silkworm diseases.
- Aid establish silk reeling units in the private sector.
- Aid establish drip irrigation system in mulberry gardens.
- Assist Seri culturists and reelers to dispose of their cocoon, silk etc., in regulated cocoon markets /silk exchange
- Facilitate sericulturists to adopt new technologies developed.

Outcomes:

After successful completion of course, the student will be able to

CO1. gain knowledge to classify and label the morphological features of different varieties of mulberry.

CO2. able to apply the knowledge of ecological requirements for cultivation and propagation of mulberry.

CO3. able to know about **Mulberry management and** analyze the effectiveness of organic and inorganic fertilizers.

Co4 able to distinguish the intercultural activities, pruning methods and harvesting methods of mulberry leaf.

Co6 able to maintain the purity of the variety in each stage of egg incubation, larvae rearing, mounting, cocoon collection, moth emergence, and egg production.

Methodology: Teacher centred method

Duration: 30 days (22.03.22-14.05.22)

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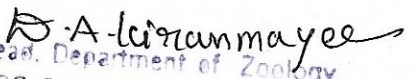
Student Enrolment Sheet

Class IB.Sc BZC (TM & EM)

S. No	Roll No.	Name of the Student	Signature
1	20-301	J.VENKATESH	J. Venkatesh.
2	20-302	J.PAVANI	J. Pavani
3	20-303	K.SRIVIDYA	K. Sri Vidya
4	20-304	A.BHUVANA	A. Bhuvana
5	20-305	G.KAVITHA	G. Kavitha
6	20-606	A.REVATHI	A. Revathi
7	20-307	B.LOKESWARI	B. Lokeswari
8	20-308	K.NAGA KAVITHA SRI	K.N. Kavitha Sri
9	20-309	G.SRAVANI	G. Sravani
10	20-310	K.KAVYA	K. KAVYA
11	20-311	N.MEGHANA KEERTHI	N. Meghana Keerthi
12	20-312	G.NAGA ASWINI	G. Naga Aswini
13	20-314	T.DURGA RAO	T. Durga Rao
14	20-316	D.J.N.V.A BHAVANI	D.J.N.V.A. Bhavani
15	20-317	K.MOUNIKA	K. Mounika
16	20-318	K.RAMYA SRI	K. Ramya Sri

17	20-319	J.SANDHYA	J. Sandhya
18	20-320	K.RAMA DEVI	K. Rama devi
19	20-501	D.MANI DEEPIKA	D. Mani Deepika
20	20-502	M.DEEPIKA	M. Deepika
21	20-503	B.NAGA DEVI	B. Naga devi
22	20-504	N.T.V.N.MAHESH BABU	N.T.V.N. Mahesh babu
23	20-505	A.BINDU MADHAVI	A. Bindu Mathavi
24	20-507	B.KIRAN DEEPTHI	B. Kiran deepthi
25	20-508	P.DAIVA SUNDHARA NIDHI	P. Daiva Sundhara Nidhi
26	20-509	V.K.V.VARSHITHA	V. K. V. Varshitha
27	20-510	G.UMA DEVI	G. Uma Devi
28	20-511	D.NAGA MOUNIKA	D. Naga mounika
29	20-513	Y.LAKSHMI CHERISHMA	Y. Lakshmi cherishma
30	20-514	P.YUVA KISHORE	P. YUVA KISHORE
31	20-516	P.HEMA	P. Hema
32	20-517	K.BEULAH	K. Beulah
33	20-518	P.ANITHA	P. Anitha


PRINCIPAL
 AG & SG Siddhartha Degree College
 Arts & Science (Autonomous), Vuyyuru


 Head, Department of Zoology,
 AG & SG Siddhartha Degree College,
 (Autonomous)
 VUYYURU - 521 165.

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course

Title: GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Date From to

Date	Content	Module No.
22.03.22 to 31.03.22	Introduction 1.1 Definition, history and present status of Sericulture 1.2 Types of silk worms and their food plants 1.3 Prospects of Sericulture in India - Sericulture industry in different states, employment, potential in mulberry and non-mulberry Sericulture	I
01.04.22 to 15.04.22	Morphology of mulberry plant 2.1 Common varieties of mulberry used in India 2.2 Characters of root, stem and leaf 2.3 Anatomy of root, stem and leaf 2.4 Male and female reproductive organs, pollination, fertilization, development of seed.	II
16.04.22 to 25.04.22	Requirements for mulberry cultivation 3.1 Physical and chemical properties of soil and its nature 3.2 Soil moisture and water requirements 3.3 Climatic conditions - Temperature, photoperiod, humidity and rain fall	III
26.04.22 to 02.05.22	Mulberry management 4.1 Land preparation - leveling and ploughing 4.2 Irrigation - drip, sprinkler or flood irrigation, weeding 4.3 Manuring - organic, inorganic and biofertilizers 4.4 Harvesting - leaf picking, shoot-leaf harvesting, branch cutting, leaf storage	IV
03.05.22 to 14.05.22	Diseases and pests of mulberry 5.1 Fungal and bacterial diseases - Powdery mildew, red rust and leaf spot caused by fungi Mulberry wilt caused by bacteria Symptoms; mechanical and chemical control 5.2 Nematode and mycoplasma diseases - Mulberry root-knot and mulberry root rot (nematode diseases), Mycoplasma and viral mulberry disease, Symptoms; mechanical and chemical control 5.3 Caterpillars - Bihar hairy caterpillar, semilooper Bugs - Leaf hoppers and scale insects Beetles - Girdle beetle, powder pest beetle.	V

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Test Exercise:

1. What is Sericulture?
2. What is Silk Made up of?
3. What is the Process Followed in Sericulture?
4. Explain about Morigulture?
5. Discuss about Silkworm Rearing?
6. Write an essay on Silk Reeling?
7. What are the common problems faced by farmers during sericulture?
- 8.. What are the Challenges Faced in Sericulture?
- 9.What is the importance of sericulture?
- 10.What are 5 uses of sericulture?

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Key:

Ans1. Sericulture is the process of cultivating silkworms and extracting silk from them. The caterpillars of the domestic silkworm (also called 'Bombyx Mori') are the most commonly used silkworm species in sericulture. Other types of silkworms (such as Eri, Muga, and Tasar) are also cultivated for the production of 'wild silks'. An image detailing the different types of silkworms is provided below.

Ans2. Silk is a fiber made up two different proteins – sericin and fibroin. Approximately 80% of silk fiber is made up of fibroin, which is concentrated at the core. This core is surrounded by a layer of sericin (which makes up the remaining 20% of silk) The presence of pigments (such as xanthophyll) in the sericin layer of the fibre imparts colour to the silk. Each type of silk has a distinct colour, as tabulated below.

Type of Silk	Colour
Mulberry Silk	Yellow/Green
Eri Silk	Creamy-White/Brick-Red
Tasar Silk	Copper-Brown
Muga Silk	Golden

Ans3. For the production of mulberry silk, the sericulture process follows three primary steps.

- Moriculture – the cultivation of mulberry leaves.
- Silkworm rearing – promoting the growth of the silkworm.
- Silk reeling – the extraction of silk filaments from the silkworm cocoons.

Finally, the silk filaments are woven together to form a thread. These threads are often plied together to form a yarn.

Ans4. Moriculture refers to the cultivation of mulberry plants, whose leaves are used as silkworm feed. These plants can be grown via three different methods:

- Cultivation from seeds
- Root-grafting
- Stem grafting

The stem grafting method is the most commonly used method for mulberry plantation. Here, cuttings that are approximately 22 centimetres in length, containing at least 3 buds, are extracted

from the stem of a mature mulberry plant. These cuttings may be directly planted or first kept in nurseries and then transplanted.

The mulberry leaves can be harvested from the plants via the following methods:

- Leaf picking – the removal of individual leaves by hand.
- Branch cutting – removal of the entire branch.
- Top shoot harvesting – removal of the mulberry shoot tops.

It is interesting to note that 1 kilogram of mulberry leaves can feed approximately 50 silkworms (from the egg stage to the cocoon stage).

Ans5. In sericulture, the silkworm rearing process begins with the laying of eggs by the female silk moth. Typically, 300-500 eggs are obtained from one female silk moth. These eggs (laid on a paper/cardboard sheet) are then disinfected with the help of a 2% formalin solution.

A feeding bed is prepared on a rearing tray by sprinkling chopped mulberry leaves onto it. The hatched larvae are transferred into this tray via a process known as brushing. In order to maintain humidity, foam strips are soaked in water and placed on the tray.

The silkworm larvae initially have a good appetite. As they grow, their appetite slowly diminishes until their active stage. At this stage, the silkworm eats enthusiastically until its final feeding stage.

After reaching maturity, the larvae begin searching for hospitable places to begin their pupation. At this stage, the body of the silkworm shrinks and becomes translucent. These mature larvae now wrap themselves in a cocoon by secreting saliva from the two salivary glands on their heads. This saliva solidifies and becomes silk when it comes in contact with air. Generally, the cocoon is spun in 2-3 days. However, some varieties of silkworms can take up to 4 days to spin their cocoons.

Ans6. Inside the cocoons, the larvae undergo **metamorphosis** and turn into pupae. The harvesting of silk from these cocoons is the final stage of sericulture. First, the pupae inside the cocoon are killed by boiling the cocoon and exposing it to steam and dry heat. This process is called stifling.

Now, the silk filaments are removed from the dead cocoon via a process called reeling. When the cocoons are placed in boiling water for approximately 15 minutes, the adhesion of the silk threads reduces, enabling the separation of individual filaments. These filaments are twisted into a thread with the help of a series of guides and pulleys. This silk is then re-boiled in order to improve its lustre.

one thread of silk contains approximately 50 silk filaments. However, over 900 meters of filament can be obtained from a single cocoon. Thus, raw silk is obtained from the silkworm and the sericulture process is completed.

Trivia

- The boiling of silkworm cocoons in the sericulture process has come under severe criticism from several individuals and organizations.
- Mahatma Gandhi actively promoted the use of Ahimsa silk (or peace silk). This method of producing silk did not involve the boiling of silkworm pupae and, therefore, did not violate the Ahimsa philosophy.

- Campaigns have been formed to protest against the inhumane treatment of silkworms by the People for the Ethical Treatment of Animals (PETA).

Ans7. Diseases can affect the eggs and destroy them, the infection may result in the shrinkage of larvae bodies, insufficient technical skills may result in low-quality silk, and insufficient silkworm production – these are some of the common problems faced in sericulture.

To learn more about sericulture and other related concepts, such as the **life cycle of the silkworm**, register with BYJU’S and download the mobile application on your smartphone.

Ans8. Silk farmers practicing sericulture are met with several challenges that could potentially destroy their harvest. They are also prone to many **health hazards**. Silkworms are vulnerable to several diseases such as pebrine and flacherie. Also, several pests threaten the healthy growth of silkworm larvae. Some important challenges faced in sericulture are listed below.

- The pebrine disease can infect the eggs, resulting in their death before the hatching of the larvae. Any larvae affected by this disease develop dark spots and become lethargic.
- Viral infections in the larvae may result in the shrinkage of their bodies. They may also start giving off an unpleasant odour.
- Other viral infections such as cytoplasmic polyhedrosis can cause the larvae to lose their appetites.
- The muscardine infection, caused by fungi, can cause the larvae to become extremely feeble and eventually die.
- The larvae of dermestid the beetlesnotepad
- can bore into the silkworm cocoons and eat the pupae. Silk cannot be reeled from these damaged cocoons.
- Some mites produce a toxic substance that kills silkworms.

Ans9. Sericulture offers self-employment opportunities to educated unemployed youth in different sectors. Many by-products can also be produced from sericulture activities. Moreover, Mulberry and silkworm have pharmaceutical values in the world

Ans10. It is used in **clothing, upholsteries, surgical sutures, beddings, parachutes, etc.** Sericulture is the cultivation of silkworms for harvesting silk. This article will look closer at the impact of sericulture on economy, environment, and society.0

Department of Zoology. - 2021-2022.
Value Added Course
Student List.

18

S.No	Reg. No	Category	Name of the Student	Marks 50	certificate issued & Signature
1)	21-901	BC-D	V. BHANU PRAKASH	45	V. Bhanu Prakash
2	902	BC-D	A VIJAYALAKSHMI	48	A. VIJAYALAKSHMI
3	905	BC-D	K. HEMANTH	47	K. Hemanth
4	908	BCE	M. SUFIYA	48	Md. Sufiya.
5	910	SC	CH. PUSHPARAJU	46	Ch. Pushpa Raju
6	911	OC	V. J. S. VARDHAN	46	V.J. S. Vardhan
7	912		A. NAGESWARI	40	
8	913	OC	N. GREESHMITHA	46	N. Greeshmitha.
9	914	OC	P. ANJALI	45	P. Anjali
10	915	Sc	K. MOUNIKA	47	K. Mounika
11	917	Sc	K. AKHILA	48	K. Akhila
12	919	BCE	S. SAMEENATHASILEEM	48	sk sameena Tasleem.
13	920	SC	M. DURGA RANI	47	M. Durga Rani
14	924	BC-D	K. VENKATA GOPI	45	K. V. Gopi
15	925	SC	K. SWAPNA	48	K. Swapna
16	926	SC	K. VARUN	46	K. Varun.
17	927	SC	K. BHARGAVI	47	K. Bhargavi
18	928	SC	N. SAI TEJA	48	N. Saiteja
19	929	SC	S. NANDINI	49	S. Nandini
20	930	BC-C	Y. ABHIGAILU	49	Y. Abhigailu
21	917	Sc	Jc		

SALINI

Head, Department of Zoology,
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INTERNAL AUDIT
IOAC
AG & SGS Degree College
VUYURU - 521 165

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Department of ZOOLOGY

Value Added Course

Title: GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Feed Back Form

1. Is the programme interested to you (Yes/No) ✓
2. Have you attended all the session (Yes/No) ✓
3. Is the content of the program is adequate (Yes/No) ✓
4. Have the teacher covered the entire syllabus? (Yes/No) ✓
5. Is the number of hours adequate? (Yes/No) ✓
6. Do you have any suggestions for enhancing or reducing the number of weeks designed for the program? (Yes/No) ✓
7. On the whole, is the program useful in terms of enriching your knowledge? (Yes/No) ✓
8. Do you have any suggestions on the program? (Yes/No) ✓

J. Venkatesh - 20-301

II. BSc (T.M)

Bhau
PRINCIPAL

AG & SG Siddhartha Degree College of
Arts & Science (Autonomous), Vuyyuru

D. A. Laxmanmayee
Head, Department of Zoology,
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Department of ZOOLOGY

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Feed Back Form

1. Is the programme interested to you ✓
(Yes/No)
2. Have you attended all the session ✓
(Yes/No)
3. Is the content of the program is adequate ✓
(Yes/No)
4. Have the teacher covered the entire syllabus? ✓
(Yes/No)
5. Is the number of hours adequate? ✓
(Yes/No)
6. Do you have any suggestions for enhancing or reducing the number of weeks designed for the program? ✓
(Yes/No)
7. On the whole, is the program useful in terms of enriching your knowledge? ✓
(Yes/No)
8. Do you have any suggestions on the program? ✓
(Yes/No)

G. Sravani (20-309)
II-B-2-C (T-M)

Chaver
PRINCIPAL

AG & SG Siddhartha Degree College of
Arts & Science (Autonomous), Vuyyuru

W. A. L. Rammayee

Head, Department of Zoology,
AG & SG Siddhartha Degree College,
(Autonomous)
VUYYURU - 521 165.

Title of the Paper : General Sericulture, mulberry cultivation & Management

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
$\frac{29}{12}$	$\frac{30}{12}$	$\frac{4}{01}$	$\frac{5}{01}$	$\frac{6}{01}$	$\frac{11}{01}$	$\frac{18}{01}$	$\frac{19}{01}$	$\frac{20}{01}$	$\frac{21}{01}$	$\frac{25}{01}$	$\frac{27}{01}$	$\frac{29}{01}$	$\frac{01}{02}$	$\frac{03}{02}$																
P	A	P	P	P	P	P	A	P	P	P	P	P	P	P	-	26	-	87%												
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P	A	P	P	A	P	P	P	P	P	P	P	P	P	P	-	25	-	83%												
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P	P	P	A	P	P	P	P	P	P	P	P	P	A	P	-	25	-	83%												
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**A.G. & S.G. SIDDHARTHA DEGREE
COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

Re Accredited with Grade 'A' by NAAC, Bangalore
vuyyuru - 521256, Krishna Dist., A.P



*This is to certify.....of.....has
successfully completed the certificate course in **Sericulture**
organized by the department of zoology during the year 20 - 20
in association with IQAC and passed the examination in grade.....*

Course Coordinator

Principal

2021 - 2022

Sericulture