1. INTRODUCTION

Tasar culture is practiced long back from ancient times. It is a major source of livelihood of tribal residing in central and northern India which is mainly known for its tropical tasar culture. Processing of seed cocoons for production and supply of quality seeds (egg) in desired quantities is technically known as Grainage activities. This is one of the most challenging tasks of tasar silk industry at the grass root level.

A systematic and methodological approach of silk worm seed production is required to sort out the problem of preparation of quality seeds in time in terms of higher seed production.

The tropical tasar silk worm (*Antherea mylitta* D) is wild in nature and it undergoes diapause. The diapause is a period where the silk worm goes to hibernation for its further stages. Facultative nature of diapauses and outdoor nature of rearing coupled with changing climatic conditions result in to pupal mortality, erratic and unseasonal emergence during preservation and unsynchronized moth emergence, prolonged emergence duration, low mating percentage, low fecundity and poor hatching together with extended duration of egg laying and hatching thereby causing loss of valuable seed material.

Tasar seed production as a profession provides a better opportunity for rural stack to earn proper income in his dwelling places. This NSQF Course gives a intensive technical knowhow to the entrepreneur to produce optimum quality and quantity of tasar seed production.

2. GENERAL INFORMATION AND COURSE STRUCTURE

1. Module Name	Sericulturist - Tasar Graineur/Seed Producer
2. Sector	Agriculture
3. Course Code	CG/AGR/SER005
4. Entry qualification	Preferably 5th standard and Minimum 14 years of age.
5. Terminal competency	The successful candidate would be able to carry out works starting from selection of seed cocoons, garland making moth emergence to egg laying and packing
6. Course duration	200 hours
7. Preface	Preparation of eggs is an important activity in grainage to produce quality disease free layings. Therefore development of skill is pre-requisite for quality egg production.

3. DISTRIBUTION OF TRAINING ON HOURLY BASIS

Sr. No	Broad Practical and theory components to be covered	Duration in hours
01.	Specification of Disinfection of grainage house and equipments Observation of seed rearing site to Collection of seed cocoons Sorting of seed cocoons Garlanding of cocoons Precaution during garlanding and preservation Maintenance of hygienic conditions in grainage house during egg preparation	50
02	Different examination method of female tasar moth, mating period and decoupling of tasar moth, natural pairing and induced pairing, reuse of male moth, egg laying equipment, use of centrifuge and microscope for Disease Free Layings, slide preparation, use of chemicals, detection of virus, bacteria and other harmful disease causing elements, preventive measures for better hygienic conditions for seed preparation individual	45
03	Use of different egg laying equipment their merit and demerit, coupling of male and female moth, safe coupling duration, decoupling , preparation for egg laying, cutting of wings, egg laying duration, maintenance of climatic conditions during egg laying, precaution during egg laying	60
04	Collection of laid eggs, preparation of chemicals for egg washing, stages of egg washing, precaution during egg washing, different methods of egg washing, egg cleaning, different egg drying methods including drying by egg drying machine	40
05	Packing of eggs, weighing of eggs, packing material, egg transportation equipments, egg transportation period and egg incubation	5
	Total	**200**

4. JOB ROLE

Brief description of job role:

It is an established fact the demand for tasar silk worm seed far exceeds the production by the Central Silk Board (Govt. Of India) and the state govt agencies (Department of Sericulture). As a result, the rearers mostly tribal have to look for alternate employment elsewhere or and to misuse the forest resources.

Since the production capacity of tasar farms at the government level is limited, a new approach of developing private grainages (egg production units) has been envisaged. The Central Silk Board promoted pilot project for quality seed production through self help groups and private grandeurs with the help of state government agencies and NGOS under different schemes.

This course may provide an opportunity to needful person to give employment by providing platform during commercial crops of tasar.

5. GENERAL TRAINING PLAN, ASSESSEMENT & CERTIFICATE

General Training Plan:

The training module is designed in such a way that a low level literate person (5^{th} pass) can Undergo training and learn all theoretical and practical aspects of it.

Assessor:
A competent assessor, not below in qualification and experience than the Trainer of the course, would be involved for assessing the learning capacity of the trained trainee.

Pass regulations:
Minimum passing mark for practical is 40%
Minimum passing marks for theory is 40%.

CERTIFICATE:
Successful persons will be awarded certificates issued by Chhattisgarh State Skill Development Authority.

6. LEARNING OUTCOME

The following are minimum broad learning outcome after completion of the tasar seed producer course of 120 hours duration.

1. **General outcome:**

The trainee will be in a position to understand the importance of seed cocoon rearing, seed cocoon rearing site maintenance, maintenance of hygienic conditions in the field as well as grainage house and have a forward and backward linkages with tasar rearer and tasar seed cocoon producer.

2. **Specific outcome:**

The trainee will know all the major activities like specification of model grainage houses, disinfection of grainage house and equipments, selection criteria of seed cocoon, garland making and hanging of seed cocoons, moth emergence, natural pairing, induced pairing, depairing, egg laying equipments, egg laying preparation, egg laying climate, egg laying period, collection of eggs laid, washing process, cleaning process, drying process, different moth examination methods including use of chemicals and Centrifuge, egg packing material, egg weighing balance, egg packing, egg transportation equipment and hygiene and climatic requirement during transportation.

7. ASSESSABLE OUTCOMES WITH ASSESSMENT CRITERIA

1. The training shall be conducted as per the syllabus.
2. The training shall demonstrate the competency which is defined below in assessable outcome and assessment criteria.
3. All the assessable outcome are to be tested during formative assessment, observations and viva –voice.

GENERIC ASSASSABLE OUTCOME

Assessable outcome	Assessment Criteria
01	Follow and maintain to achieve a safe working environment in line with occupational health and safety regulation and requirement and according to the site policy
02	Identify and take necessary precaution on fire and safety hazards and report according to site policy and procedure
03	Identify basic first aid and use them under different circumstances
04	Avoid waste and dispose waste as procedure

SPECIFIC ASSESSMENT OUTCOME

	Assessable outcome	Assessment Criteria
05	Grainage house preparation	Selection of appropriate grainage house Preparation for grainage activity Hygiene of grainage house Climatic control in grainage
06	Selection of seed cocoon	Selection criteria of seed cocoon Selection parameters and its importance Pupation percentage of selected cocoons
07	Garland making	Standard garland size Garland making procedure Garland hanging procedure Maintenance of hygiene and protection from rat and others
08	Emergence, pairing and depairing of moth	Optimum emergence period Optimum temperature and humidity required for better Emergence Natural –pairing Induced pairing Optimum pairing period De-pairing

09	Examination methods	Abdomen prick method Abdomen crush method Centrifuge method Use of chemicals Slide preparation
10	Egg laying equipment	Egg laying in earthen pot Egg laying in plastic boxes Egg laying in plastic bags
11	Egg collection and washing	Method of egg collection Different stages of egg washing Chemical used for egg washing Precaution during egg washing
12	Egg weighing and packing	Methods of egg drying by manual and mechanized way Egg packing material Standard egg packing
13	Egg carrying and transportation	Egg carrying equipments and its use in different climate Favourable egg transportation period

8. SYLLABUS CONTENT WITH TIME STRUCTURE

Duration: 200 hours

Detailed Syllabus

PRACTICAL	THEORY	Duration	
		Practical	Theory
	General Theory Qualities required for good graineur good behaviour, patience, responsibility, self confidence, anticipation, grainage maintenance ability.	0	5
	Model grainage House Type of grainage house Merit and Demerit of different grainage houses Pre-requisite of grainage houses Grainage capacity	0	3
Disinfection of grainage house and equipments	Disinfectant chemicals Chemical concentration of disinfectants Grainage equipment disinfection process	10	4
Selection of seed cocoons	Seed cocoon selection criteria & parameters Shell ratio, pupation percentage.	8	2
Garland making	Garland making process No. of cocoons per garland Precaution in garland making	8	2

	Hanging of garlands Hanging distance and height		
Moth emergence, selection and pairing	Moth selection criteria Selection of diseased moth Natural pairing Induced pairing Pairing period Precaution during pairing Pairing climate	25	15
Egg laying	Use of different egg laying devices Egg laying period Egg laying climate Egg collection	20	15
Microscopic examination	Type of microscope for examination Magnification and its importance Abdomen prick method Abdomen crush method Slide making Use of chemicals during slide making Size and shape of pebrine spore and bacteria Identification of pebrine spore and bacteria Use of Centrifuge apparatus Importance of Centrifuge apparatus	25	15
Egg washing	Preparation of of egg washing Chemicals used for egg washing Egg washing solution preparation Stages of egg washing Timing of egg washing Precaution during egg washing Different egg washing methods	10	6
Egg drying	Traditional egg drying method Egg drying through machine Climate during egg drying Precaution during egg drying	12	4
Weighing and packing of Disease Free Layings	Standard weighing process Standard packing process Standard packing material Labelling of egg carrying bags	4	4
Transportation of DFL	Egg transportation equipment Appropriate time of egg transportation Preparation of transportation Precaution during egg transportation	1	2
	Total	**123**	**77**
	Grand total	**200**	

9. INFRASTRUCTURE

1 Instructor's / Trainer's Qualification	Degree in Science with 10 years of sericultural working experience
2. Desirable Qualifications	Tasar seed production instructor must be trained from Central Silk Board national level training institute at least for six months
3. Lab/ Space Norms	2000 sft. Area is required with a model grainage house
4.Power Norms	5 KW minimum
5.Tools, equipments and machinery	As per Annexure 1

10. ASSESSMENT STANDARD

The trainer/assessor should ensure appropriate arrangements for assessment and appropriate resources are available for undertaking such assessment. The nature of special needs should be taken in to account while undertaking assessment. In this work there is evidence of

1. Weightage in range of 60-75% to be allotted during assessment under following performance levels. For performance in this grade the candidate with occasional/ frequent guidance and showing due regard for grainage procedures and practices, has attained grainage skills which demonstrates reasonable standard set forth.In this work there is evidence of :

- Demonstration of good graineur skills with different methods.
- Below 70% accuracy achieved while undertaking different skills demanded by the set standards.
- A fairly good level of neatness and consistency in handling controls.
- Occasional support in completing the job.

2. Weightage in range of 75-90% to be allotted during assessment under following performance levels. For this grade with little guidance and showing due regard for safety procedure and practices, has attained graineur skills which demonstrates reasonable standard set forth.

In this work there is evidence of:

- Good skill level in graineur skills in grainage with different methods.
- 70-80% accuracy achieved while undertaking different skills demanded by the set standards.
- A good level of neatness and consistency in handling controls.

- Little support in completing the job.

3. Weightage in range of above 90% to be allotted during assessment under following performance levels. For performance in this grade the candidate with minimal or no support in organization and execution and with due regard for grainage procedure and practices has attained seed producing skill which demonstrates reasonable standard set forth.

In this work there is evidence of:

- High skill levels in the use of seed producing skills in grainage with different methods.
- Above 80% accuracy achieved while undertaking different skill demanded by the set standards.
- A high level of neatness and consistency in handling controls.
- Minimal or no support in completing the job.

11. EXTERNAL ASSESSMENT

Sr. No	Assessable outcome	Assessment result
GENERIC		
01	follow and maintain to achieve a safe working environment in line with occupational health and safety regulation and requirement and according to the site policy	3
O2	Identify and take necessary precaution on fire and safety hazards and report according to site policy and procedure	4
03	Identify basic first aid and use them under different circumstances	5
04	Avoid waste and dispose waste as procedure	3
SPECIFIC		
05	Selection of appropriate grainage house Preparation for grainage activity Hygiene of grainage house Climatic control in grainage	11
06	Selection criteria of seed cocoon Selection parameters and its importance Pupation percentage of selected cocoons	12
07	Standard garland size Garland making procedure Garland hanging procedure Maintenance of hygiene and protection from rat and	10

	others	
08	Optimum emergence period Optimum temperature and humidity required for better Emergence Natural –pairing Induced pairing Optimum pairing period De-pairing	13
09	Abdomen prick method Abdomen crush method Centrifuge method Use of chemicals Slide preparation	15
10	Egg laying in earthen pot Egg laying in plastic boxes Egg laying in plastic bags	10
11	Method of egg collection Different stages of egg washing Chemical used for egg washing Precaution during egg washing	10
12	Methods of egg drying by manual and mechanized way Egg packing material Standard egg packing Egg carrying equipments and its use in different climate Favourable egg transportation period	05
	Total	**100**

Annexure -1

Tools, equipments and chemicals required for a batch of 30 students.

Sl. No.	Description	Unit	Quantity
1.	Seed Cocoon	No	5000
2.	Cover glass	Packet	10
3.	Slides	Packet	10
4.	Earthen pot	No	400
5.	Egg laying plastic box	No	400
6.	Egg laying Nylon Net	No	400
7.	Potassium Dicromate	Grams	100
8.	Potassium Hydroxide	Grams	100
9.	Formalin	Liter	05
10.	Bleaching powder	Kg	05
11.	Lime	Kg	10
12.	Hydrocloric Acid	Liter	01
13.	Washing bottle	No	05
14.	Tooth pick	Packet	10
15.	Napkin	No	20
16	Soap	No	10
17	Muslin cloth	Meter	05
18	Scissors	No	05
19	Dissection Box	No	05
20	Hand gloves	Pair	25
21	Funnel	No	05
22	Glass rod	No	10
23	Test Tube	No	10
24	Measuring Cylinder (100 ml to 1 litre)	Set	02
25	Microscope	No	05
26	Minimum , maximum Thermometer	No	03
27	Hygrometer	No	02
28	Digital Balance	No	02
29	Centrifuge	No	01
30	Mortar and pestles	No	10
31	Egg transportation bag	No	20
32	Torch	No	05
32	Air cooler	No	04
33	Gunny cloth	No	20