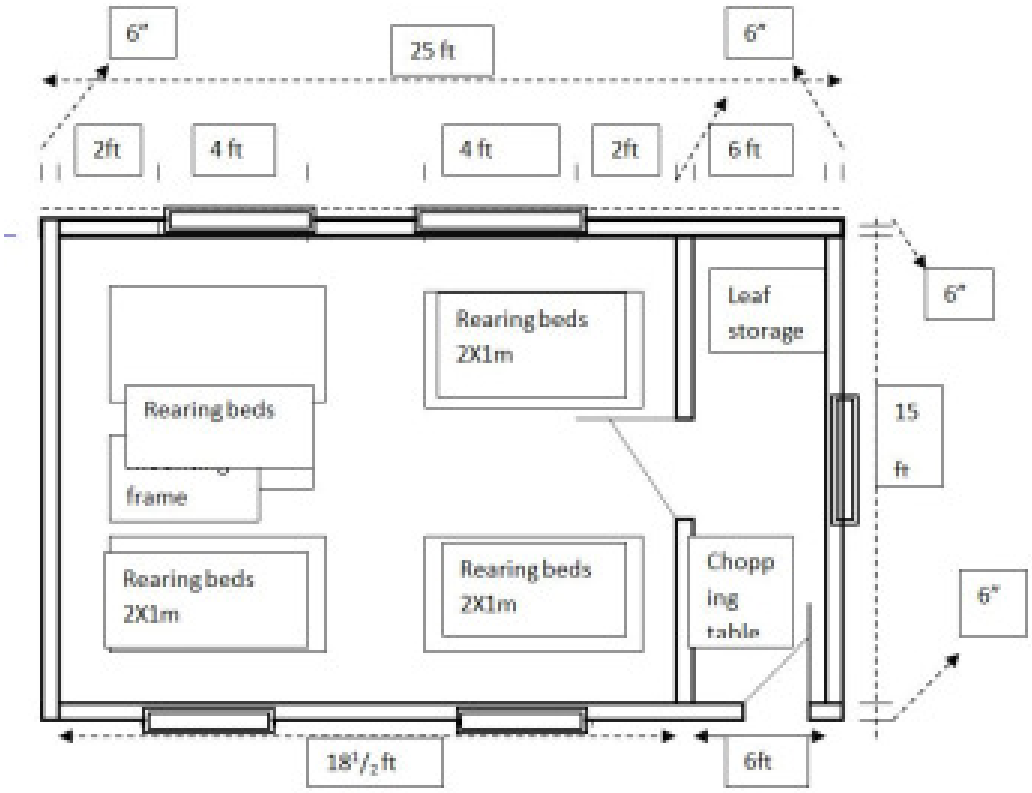
KRISHNENDU DAS

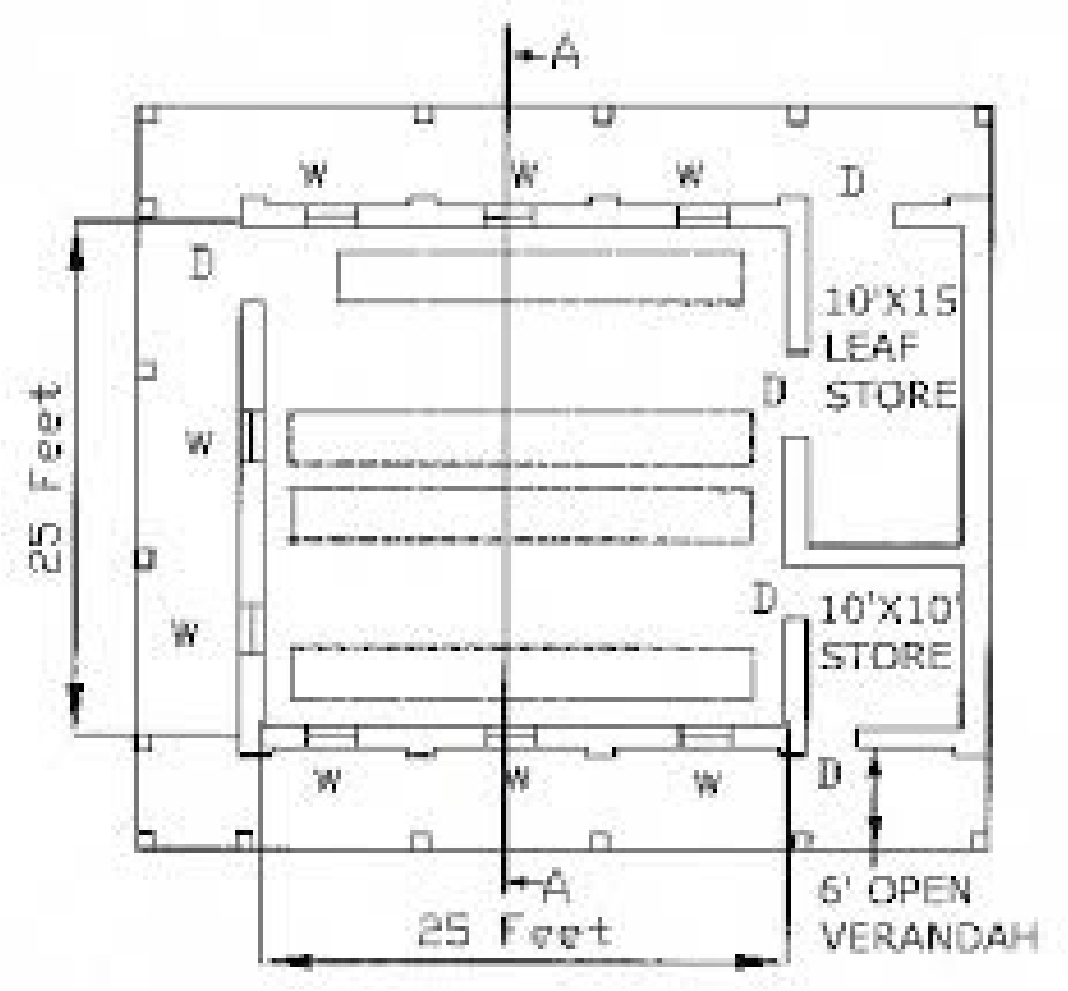
SEMESTER – II

SILKWORM REARING (UNIT 1)

CSB- MODEL REARING HOUSE

A silkworm-rearing house is the place where the silkworms are reared to produce cocoons. The cocoon quality and yield are adversely affected if the optimal environmental conditions i.e. temperature, relative humidity, ventilation, illumination, hygiene, etc. are not provided to the silkworms.





Rearing House

- A separate house is ideal for rearing of silkworm
- The rearing house should have sufficient number of windows to permit cross ventilation.
- Provision should be made to make it air tight for proper disinfection.
- Rearing house has to be built in such a way to provide optimum temperature of 26-28º c and RH of 60-70% for the growth of silkworm at minimum operational cost

Important principles

The most important principles to be remembered in silkworm rearing house are :

Avoid

Damp condition
Stagnation of air
Direct and strong drift of air
Exposure to bright sun light and radiation

Ensure

An equable temperature and humidity
Good ventilation.

Features:

- Rearing house should be built depending on the brusing capacity and the method of rearing. The rearing area of 2 sq.ft/ dfl for floor rearing and 3 sq. ft/ dfl for shoot rearing is the general criteria.
- Rearing house should have a main rearing hall, an ante room (8 x 8 ft) and leaf preservation room. Maintaining a separate chawki room (a must for two- plot rearing system; rearing room of size 10' x 14' with a height of 9-10 ft for an acre of garden) ideal.
- Rearing house should face east-west direction.
- Rearing house should have facilities to maintain the required environmental conditions.
- Growing trees around rearing house helps to maintain favorable environment
- Rearing house should be constructed taking consideration he following points such as effective is disinfection, washable floor, etc.
- 480 sq.ft area is required for rearing 100 dfls.

Preparation of rearing house

- Rearing room is to be kept ready after disinfection atleast 3-4 days in advance of commencement of rearing.
- Preconditioning of the rearing house is essential *ie,* arrangement of rearing appliances and provision of essential environmental conditions one day in advance.

Preparation for brushing

- Before commencement of each rearing, the rearing equipments and rearing houses must be thoroughly washed and disinfected with chlorine dioxide.
- Chlorine dioxide is sprayed on equipments, walls, roof and floor uniformly to destroy the disease causing organisms.
- The rooms should be kept closed for about 24 hours after disinfection.
- The doors and windows should be kept open at least for 24 hours before commencement of rearing to avoid traces of disinfectants.
- To disinfect rearing room and rearing appliances, chlorine dioxide can be used. 500 ml of chloride dioxide is mixed with 50 g of activator and this is dissolved in 20 litres of water. To this, 100 g of lime powder has to be mixed.

Rearing appliances

Non-recurring (General)

- Disinfection mask
- Sprayer for disinfection
- Room heater
- Water air cooler
- Kerosene blow lap
- Wet and dry thermometer
- 6” forceps

Non-recurring (specific)

- Egg transportation box
- Egg incubation chamber
- Loose egg incubation frame
- Black box
- Chawki rearing trays
- Rearing bottom stand
- Feeding Stand
- Ant wells
- Leaf chopping board
- Leaf chopping knife
- Leaf mat
- Bed cleaning nets
- Earthen pot
- Litter basket
- Late age rearing trays
- Rearing stand
- Shoot rearing rack
- Chandrike
- Plastic basin
- Buckets
- Mug
- Plastic box
- Foam pads
- Foot rugs
- Leaf chamber for late age
- Leaf basket
- Cleaning nets

Recurring

- Paraffin paper
- Formalin

- Bleaching powder
- Lime powder
- Bed disinfectants
- Slides and cover slips
- Gunny cloth
- Cora cloth

CHARACTERISTICS OF REARING HOUSE

A rearing house should essentially provide sufficient bed space for silkworms and working space for the workers attending the rearing operations, good ventilation to replace ammonia, carbon dioxide and other noxious gases released by the silkworms during respiration, excretion, etc. There should be space for leaf preservation, storing other appliances and chemicals or disinfectants used in rearing. The rearing house should be provided with mesh or nylon net all around to prevent entry of uzifly, the most dreaded pest of silkworm. An ante-chamber is necessary to avoid the entry of uzifly, so that the workers can watch, if the fly enters along with them. Lizards and rats are the common predators and therefore construction of a rat-proof sill around the rearing house is necessary. The rearing house should facilitate making it air tight for fumigation or disinfection to ensure the fumes or vapours from the disinfectants remain inside the house till the germs inside are completely eliminated. Most of the sericulture area falls under warmer zones and the rearing house is expected to provide a cooler ambience to the silkworm. Use of any material that keeps the inner environment cool and prevents radiation from the sun is preferred. Mud wall and thatch roof are the most ideal that can cool the inner ambience to the maximum, though, its life is shorter and requires repair of the roof once in every 3-4 years. Hollow cement bricks, burnt earthen bricks and stone slabs are also used very commonly. North or south facing of the rearing house is preferred as it provided good aeration since the wind blows either from the north-east or from the south-west. This also reduces the chance of direct sunlight falling on the rearing bed either in the morning or in the afternoon.

SELECTION OF SITE

As we use pungent disinfectants, which may be hazardous particularly to those suffering from respiratory problems, it is ideal to have the rearing houses away from the thickly populated areas. It is also advisable to keep them off the places of livestock as the chemicals used may harm them. It is also necessary to avoid damp areas which facilitate easy multiplication of disease causing germs and spread of diseases. Areas closer to tobacco barrens, lime or brick kilns, and industrial establishments emanating dust, smoke and other noxious gaseous are unfit for rearing activities. Keeping them close to gardens or fields where excessive pesticides are sprayed is also not advisable. Shaded areas under large trees are good for locating rearing houses as they provide cool environment and fresh and clean air in the areas where the temperature and humidity is high. It is ideal to have the rearing house closer to the mulberry garden as it will be convenient to feed fresh leaves with very little moisture loss that occurs during

transportation.

ACCOMMODATION FOR DIFFERENT ACTIVITIES IN REARING

The rearing activities involve Chawki rearing, i.e. rearing of young worms usually of the first two instars; late age rearing, involving the rearing of third to 5th instar larvae and mounting for spinning. Small farmers use the same rearing house for all the activities which together lasts for 30-35 days including cleaning and disinfecting. Larger farmers use separate rearing houses for rearing young (Chawki) worms and separate mounting hall. As young larvae (up to 2nd moult) require to be fed with tender chopped leaves and the bed humidity maintained high (80-85%) and cared much, they are usually reared in wooden or plastic trays with the worms wrapped in paraffin paper with one sheet on the floor of the tray and the other above the silkworms fed with the chopped leaves and the trays placed one above the other in tiers . Around 30-40 square feet of bed area is required for various breeds of silkworms up to the end of 2nd instar. The space requirement is double if reared up to the end of 3rd instar. The success of the cocoon crop depends up on the care taken during the Chawki stage. For maintaining the temperature and humidity, small & compact room is required to rear young age silkworms. Hence, the concept of community Chawki rearing under expert supervision and special care is being promoted. A viable Chawki rearing centre shall rear from 2500 to 5000 layings per batch which runs for 8 days. Chawki Rearing Late age rearing is done in two methods, viz., tray (leaf) feeding associated with leaf plucking and shoot feeding associated with shoot harvest. In case of leaf feeding, around 38 m2 of bed area is required for rearing 100 layings. Since the rearing is done in rearing trays placed on rearing stands in tiers each with 10-12, it requires a rearing house with a smaller floor area (around 20m2). However, it requires a higher manpower for feeding operation . Around 70m2 bed area is required for rearing 100 layings in case of shoot feeding. This is organized by erecting rearing shelves in 4 or 5 tiers. A platform of 5' x 35' will accommodate 25 layings. A rearing house with floor area of 400 sq. ft. will be enough to rear 100 layings. Rearing rooms/halls are constructed to accommodate the rearing stands or rearing racks lengthwise, one set on either side of the room with a reasonable working space. Shelf Rearing. Tray Rearing 31 Silkworm Rearing House Fully mature larvae stop feeding, empty their gut and become translucent. They crawl (for support) for spinning cocoon around them. At this stage, the worms are transferred to the mountages. The traditional bamboo made mountages are called 'chandrike'. They can also spin cocoons on straw or dry twigs. There are a number of improved mountages like plastic collapsible mountages and rotary cardboard or plastic mountages . where the wastage of silk is less. Spinning and pupation lasts for 4 days after which the cocoons are harvested from the mountages and taken to market. Before spinning, the silkworms urinate causing a high humidity and pungent smell. Therefore, the spinning worms require a dry climate with free flow of air to ensure formation of stiff cocoons without urination spots. Therefore, the mounting halls are almost near open sheds with wide windows and with wire mesh covering all around. Bamboo Chandrike and Plastic collapsible Plastic Bottle Rotary Mountage Mountage Brush Mountage The environmental condition required for leaf preservation is different from the silkworm

rearing and there is chance of mixing of leaf or shoot with the silkworm litter if leaf is preserved in the same room where rearing is being conducted. Hence, separate room is required for preserving the leaf/ shoot. It is suggested to have a leaf preservation room with each rearing house as the leaf has to be preserved without moisture loss and free from contamination from the rearing bed refuse . Also, it is advised to have a small disinfection tank to dip the rearing trays and mountages in the disinfectant solution so that their disinfection shall be completed.