

Muga silkworm (*Antheraea assamensis*) is a polyphagous and endemic species in the northeastern parts of India. This semi-domesticated silkworm is multivoltine in nature, producing 5 to 6 generations per year, with commercial rearing conducted during the spring and autumn seasons. It is primarily reared outdoors on two host plants: Som (*Persea bombycina*) and Soalu (*Litsea monopetala*). Muga silkworm rearing occurs in six different seasons throughout the year. Among these, the April-May and October-November seasons are designated as commercial crop seasons, while the December-January and June-July crops are known as pre-seed crops, and the February-March and August-September crops are designated as seed crops.

Name of crops	Month	Remark
Kotia	Oct-Nov	Commercial crop
Jarua	Nov- Jan	Pre-seed crop
Chotua	March-April	Seed crop
Jethua	April-May	Commercial crop
Aherua	June-July	Pre-seed crop.
Bhodia	Aug-Sep	Seed crop.

Muga silkworm performs best at temperatures ranging from 25–28°C and humidity levels of 75–85%. Generally, a temperature range of 15–33°C is considered suitable for Muga silkworm rearing. During commercial crop seasons, climatic conditions are usually favorable, with ample suitable foliage. During pre-seed and seed crops the climatic condition mostly remains unsuitable with heavy infestation by pests and predators.

1. Establishment of Plantation:

- ▶ Clean bushes and weeds from the selected terraces in May-June.
- ▶ Assess the soil pH of the terraces/plots and apply the recommended dose of dolomite or gypsum to neutralize it.
- ▶ Dig pits of 2’ x 2’ x 2’ at a spacing of 3 m x 3 m. Fill each pit with a mixture of 0.5 cubic feet of well-decomposed farmyard manure and soil in the 3rd-4th week of June.
- ▶ Transplant healthy, vigorous seedlings that are 10-12 months old during the 1st week of July.
- ▶ Weed and clean the terraces as needed.
- ▶ Apply life-saving water during the dry season (November-May).

2. Maintenance of plantation:

For 1–4-Year-Old Plants:

- ▶ Apply 0.5 cubic feet of FYM per plant during the 2nd week of February and the 1st week of November at the plant base.
- ▶ Apply NPK 50:25:25 kg/ha (Urea: 98 g, SSP: 140 g, MOP: 38 g) in two split doses in the 1st week of April and the 3rd week of October.



For 5-Year-Old Plants and Older:

- ▶ Apply 1 cubic foot of FYM per plant during the 2nd week of February and the 1st week of November.
- ▶ Apply NPK 100:50:50 kg/ha (Urea: 98 g, SSP: 280 g, MOP: 75 g) in two split doses in the 1st week of April and the 3rd week of October.

Growth and Pruning:

- ▶ Allow plants to grow for the first 3 years. Perform light pruning of side branches in the 3rd year.
- ▶ After 5 years, lightly prune the top branches. In the 6th year, pollard the plant at 5 feet above ground level.
- ▶ Apply carbendazim to the cut ends to prevent fungal infection.



Field Maintenance:

- ▶ Remove dead twigs and leaves and burn them to reduce pest and pathogen populations.
- ▶ Apply timely preventive measures to control disease and pest infestations.

3. Muga Silkworm rearing:

- ▶ Select 4–6 ft high bushes with healthy, tender leaves for brushing Muga larvae.
- ▶ Clean weeds and unwanted bushes in the rearing field during the 1st week of June and the 1st week of August, but do not remove the green grass below the plants completely.
- ▶ Remove dry, yellow, over-mature, and very tender leaves, along with dry twigs, ant nests, wasp nests, and spider webs from the plants before brushing.
- ▶ Tie a black polythene sheet around the tree trunk to prevent worms from crawling down and to stop predators from climbing up.
- ▶ Cover plants with a nylon net prior to brushing.



4. Disinfection:

- ▶ Dust mixture of slaked lime and bleaching powder in the ratio of 9:1 surroundings the base of plant 3 days prior to brushing.
- ▶ Disinfect rearing appliances with 2% bleaching powder solution before rearing.



5. Incubation and brushing:

- ▶ Incubate DFLs at $26^{\circ}\text{C} \pm 1^{\circ}\text{C}$ with 85% relative humidity for uniform hatching.
- ▶ On brushing day, spread tender leaves over the newly hatched larvae in the early morning. Once the larvae settle, transfer them along with the tender leaves onto the tree.
- ▶ Brush 1–2 DFLs per tree to prevent overcrowding.
- ▶ Only hatching within the first three days is considered for rearing.

6. Rearing Management:

- ▶ Do not handle worms until they have completed the 3rd moult.
- ▶ Transfer 4th instar worms to taller trees (15 ft height) with semi-mature or mature leaves using disinfected bamboo chalongi.
- ▶ Do not disturb or transfer moulting worms; rear irregular or unequal-sized worms separately.
- ▶ Collect irregular, weak, diseased, and dead worms in a basin with a 2% formalin solution, then burn or bury them in a pit away from the rearing area.
- ▶ Conduct microscopic examination at each stage; if pebrine is detected, burn pebrinized worms or place them in a 10% formaldehyde solution, then bury them in a pit away from the rearing site.
- ▶ Dust slaked lime and bleaching powder in the rearing plot once during the 2nd and 3rd instars, three times during the 4th instar, and every other day during the 5th instar.
- ▶ Collect weak and dead larvae daily in a basin with a slaked lime and bleaching powder mixture and burn them away from the rearing field.

7. Preparation of cocoonage:

- ▶ Collect mango or som twigs with leaves at least two days before the worms reach maturation and allow the twigs to dry partially.
- ▶ Place the dried twigs in nylon net bags to provide a suitable environment for cocoon spinning.

8. Collection of ripe worms, spinning & cocoon harvest:

- ▶ Ripe worms usually crawl down to the base of the tree at dusk; collect them in a bamboo or plastic basket.
- ▶ Place 150 matured worms in each nylon bag, tie securely, and hang the bags in a semi-dark, well-aerated, rat-proof room for cocoon spinning.
- ▶ Mount Uzi-infested worms in a separate nylon bag. Harvest Uzi-infested cocoons on the 4th–6th day and stifle them immediately.
- ▶ Harvest cocoons only after 6–8 days. After harvesting, sort out good and flimsy cocoons.



9. Post rearing care:

- ▶ Clean the rearing plot as well as the trees and dispose off the unwanted remains in the compost pit.

For details please contact to:

Abhishek Singh, Scientist-C
Muga Eri Silkworm Seed Organization,
P-3 Unit, Nongpoh, Ri-bhoi, Meghalaya.
Ph/Fax: 07905106039
Email: abhisheksinghcsa@gmail.com

Pamphlet no. 4, MESSO, Nongpoh Dec-2024

Integrated Practices for Muga Silkworm Rearing and Plantation Management for Rearers



Abhishek Singh
Dolly Choudhury
Lopamudra Guha
N.K. Bhatia



Muga Eri Silkworm Seed Organization
Central Silk Board
(Ministry of Textiles: Govt. of India)
P-3 Unit, Nongpoh, Ri-bhoi, Meghalaya- 793102