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# Sericulture / Silk Production – Small Business

***Turn Potential Into Profit***


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# Sericulture / Silk Production for Small Business

Sericulture is the process of cultivating silkworms and extracting silk from them. The silkworm rearers use old traditional and crude methods for cocoon production, by obtaining leaves from the local full height mulberry trees grown for timber production.

Sericulture is a very important domestic industry in many countries. India and China are the world's leading producers of silk. The silk output of these two countries combined accounts for over 60% of the global production.

**What is Silk?**

Silk is a unique protein fiber produced from the interface of plant and animal. It was discovered in China 4000 years ago and up-to-date silk has continued to reign supreme over other textile fibers both the natural (cotton, wool, jute) and man-made fibers (rayon, nylon, polyester, viscose, etc.). It is due to its exclusive beauty that silk is acclaimed as the Queen of Textiles.

Silk is a fiber made up two different proteins i.e. sericin and fibroin. Almost 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 fiber imparts color to the silk. Each type of silk has a distinct color, as tabulated below.

| Types of Silk | Color |
|---|---|
| Mulberry Silk | Yellow / Green |
| Eri Silk | Creamy-white / Brick Red |
| Tasar Silk | Copper-Brown |
| Muga Silk | Golden |

Worldwide, 90 % of the silk is Mulberry silk obtained by Mulberry plants.

**Moriculture**

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 centimeters 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.

Important aspects are that;

- It is human friendly.
- Ideal for weaker section of poor society.
- Eco-friendly provide vibrancy to the village economics like Cocoon grower, reeler, twister, weaver and trader.

**Silk Rearing:**

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.

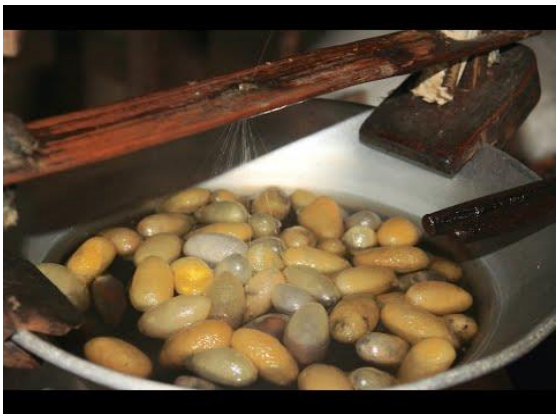
After reaching maturity, the larvae begin searching for hospitable places to begin their pupation. At this stage, the body of the silkworm shrinks and becomes translucent. These mature larvae now wrap themselves in a cocoon by secreting saliva from the two salivary glands on their heads. This saliva solidifies and becomes silk when it comes in contact with air.

Generally, the cocoon is spun in 2-3 days. However, some varieties of silkworm can take up to 4 days to spin their cocoons.

**Silk Reeling:**

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 luster.



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.

**Forest, Wildlife & Fisheries Department (FWF)**

Forest, Wildlife and Fisheries department of Government of Punjab supports sericulture and provide following facilities to the farmers:

- Silkworms and Eggs availability
- Extension & Educational Services
- Raising of Mulberry Plantation
- Fodder for Livestock
- Facilitation for timber sale to sports industry from mulberry trees

Following are the contact numbers of Deputy Director Sericulture and Senior Research Officer respectively.

- +92 42 37721702, 37728043

**Pakistan Forest Institute (PFI), Peshawar**

A sericulture unit was established at PFI, Peshawar in 1984 under a development project funded by FAO / UNDP with the objectives to conduct research studies in sericulture and moriculture and train people at various professional levels to promote sericulture industry in the country. Korean and Chinese experts provided technical know-how in silkworm rearing and silk seed technology.

Following facilities are provided at PFI:

- Availability of Silkworms / eggs
- Training of the farmers
- Testing laboratory
- Establishment of Mulberry Gene Bank
- Research garden
- Synthesis of hybrid silkworm strains and heterotic assessment
- Outreach activities

**Useful Links:**

https://fwf.punjab.gov.pk/sericulture_detail

http://www.pfi.gov.pk/contact.php

www.parc.gov.pk

www.agripunjab.gov.pk

http://managementjournal.usamv.ro/pdf/vol.17_3/Art49.pdf

www.uaf.edu.pk

www.smeda.org.pk

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