Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 05, Issue: 06 (NOV-DEC, 2025)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Seri Suvarna Technology: A Pathway to Eco-Friendly Sericulture

*Pavithra M R[1], Ashrith S[2] and Ramya V S[3]
[1]Central Office-Central Silk Board, Bangalore
[2]Indian Pesticide Limited, Mandya
[3]CSB-Regional Sericultural Research Station, Anantapura
*Corresponding Author's email: pavithramrgowda1999@gmail.com

Sericulture in India is primarily sustained by small and marginal farmers, with nearly 60 per cent of the mulberry area dependent on rainfed conditions. Erratic rainfall patterns, prolonged dry spells and declining soil fertility have emerged as key challenges limiting the productivity of mulberry and the profitability of silkworm rearing. To overcome these constraints, Seri Suvarna Technology, conceptualized and validated by Dr. K. P. Chinnaswamy, at the University of Agricultural Sciences (UAS), GKVK, Bengaluru, has been developed as a climate-smart cultivation package. The technology integrates contour trenching and organic mulching, along with protective irrigation and optimized canopy management, conserve moisture, reduce erosion, enhance soil fertility and sustain mulberry yield under drought-prone environments. Result from UAS field trials demonstrate significant improvements in leaf yield, biochemical quality and silkworm performance under rainfed conditions. Soil health indicators, including organic carbon, microbial activity and aggregate stability, were also enhanced in Seri Suvarna plots compared to conventional practices. Beyond biophysical outcomes, the technology contributes to socio-economic resilience by reducing dependence on external inputs, lowering production risks and stabilizing cocoon income for smallholders. Seri Suvarna thus represents a holistic approach to sustainable sericulture, aligning with the national goals of climate-resilient agriculture and rural livelihood security. Its wide-scale adoption can transform rainfed sericulture into an ecologically viable and economically rewarding enterprise.

Components of Seri Suvarna Technology

It includes converting mulberry garden into sub-plots by using contour bunds

1. Contour Trenching

- Trenches of suitable dimension of 2 feet width, 1.5 feet depth are dug along field contours with 10-12 feet space should be prepared in between every alternative row after pruning or across the slope
- These trenches will harvest rainwater, minimize surface runoff and also reduce soil erosion.
- Water stored in these trenches will infiltrates into the soil profile, ensuring prolonged moisture availability to mulberry roots.

2. Organic Mulching

- The above made trenches and inter-row spaces are covered with locally available organic biomass-mulberry pruning, green leave manure and green maunring crops.
- Mulching suppresses weeds, reduces evaporation and enriches soil carbon upon decomposition.
- Organic matter from mulch enhances microbial activity and nutrient cycling.
- After filling trenches with crop residue it will be covered with soil.

3. Nutrient Management

- Application of recommended fertilizers is synchronized with mulching to maximize nutrient use efficiency.
- Decomposed mulch gradually releases nutrients, reducing external input dependency.
- Mulberry plant pruning height and shoot harvest interval are adjusted based on moisture conditions.
- Moderate pruning combined with mulching optimizes regrowth and leaf biomass.

Advantages of Seri Suvarna Technology

1. Soil Moisture Dynamics

Trenches act as micro-catchments, increasing water infiltration and storage in the root zone. Mulching minimizes evaporative losses and maintains soil moisture for extended periods. Together, these practices buffer mulberry against intra-seasonal dry spells.

2. Increases Soil Fertility and Microbial Activity

Decomposition of organic mulch improves soil organic carbon content, cation exchange capacity and microbial biomass. Enhanced microbial activity accelerates nutrient mineralization, improving nitrogen, phosphorus and potassium availability to plants.

3. Reduces Soil Erosion and Improves Soil Structure

Contour trenching reduces slope length and runoff velocity, thus minimizing sheet and rill erosion. Mulch protects the soil surface from raindrop impact, preserving aggregates and porosity.

4. Improves Biodiversity

Mulching provides habitat for earthworm population and organic matter for soil fauna, enhancing biodiversity and ecosystem stability in mulberry fields. Such biodiversity contributes to nutrient cycling and natural pest regulation.

5. Increases Mulberry Yield and Leaf Quality

Improved soil moisture and fertility support better leaf succulence, chlorophyll content and biochemical quality of mulberry. Field trials at UAS, Bengaluru, demonstrated 20–30% higher leaf yield under Seri Suvarna compared to conventional rainfed plots. Leaves exhibited higher moisture content, improved nitrogen and protein levels and balanced carbohydrate-protein ratio.

6. Silkworm Performance

Silkworms reared on Mulberry leaves grown under Seri Suvarna Technology showed improved growth rate, higher larval weight and increased cocoon yield. Cocoon shell ratio and filament length were superior, indicating enhanced economic returns.

7. Soil Health Improvements

Long-term application of mulching increased soil organic carbon by 0.2-0.3% annually. Microbial populations, particularly actinomycetes and beneficial fungi, were more abundant in mulched soils. Soil aggregates exhibited greater stability, reducing erosion risks.

8. Socio-economic Benefits

Mulching reduces weeding costs due to suppression of weeds. And also leads to lower dependence on chemical fertilizers due to organic matter addition. This enables farmer stable cocoon income during drought years, enhancing farmer resilience.

Adoption and Farmer Perspectives

This technology has been widely demonstrated across Karnataka and adopted by farmers in drought-prone districts. Farmers appreciate its low cost, reliance on locally available biomass and visible benefits in terms of leaf availability during dry spells. Women farmers especially benefit due to reduced labor requirements for weeding. Cost-benefit analyses indicate that Seri Suvarna plots achieve 15-20% higher net returns compared to conventional rainfed mulberry. Its compatibility with existing farm operations and minimal additional investment make it suitable for smallholder adoption.

Conclusion

Seri Suvarna Technology emerges as a comprehensive and climate-resilient model for strengthening rainfed sericulture systems. By addressing the critical challenges of moisture stress, soil fertility depletion and yield instability, it integrates water harvesting, organic resource recycling and sustainable soil management practices into a holistic package. The future scope of this innovation lies in its convergence with drought-tolerant mulberry varieties, biofertilizers and mechanized operations such as trenching and mulching, making it suitable for larger sericulture holdings. Further, carbon sequestration assessments can provide valuable insights into its role in mitigating climate change. Scaling up the adoption of Seri Suvarna across semi-arid sericulture clusters, supported by effective extension services, will enhance ecological sustainability, improve resource-use efficiency and strengthen rural livelihood security. Ultimately, Seri Suvarna has the potential to serve as a replicable model of sustainable intensification, ensuring the resilience and prosperity of sericulture in climate-vulnerable regions.