



Development of sericulture – Dryland farming of mulberry in low tree cultivation

Dr. RAVINDRA SINGH TEOTIA*

Director, Central Sericultural Research and Training Institute, Mysore - 570 008

Central Silk Board, Ministry of Textiles, Govt. of India, Bangalore (Karnataka)

E-mail : ravi_1960@rediffmail.com, teotia.csb@nic.in

India has about 108 million hectares of rainfed area which constitutes nearly 75 per cent of the total 143 million hectares of arable land. In such areas crop production becomes relatively difficult as it mainly depends upon the intensity and frequency of rainfall. The crop production under such rainfed farming has no scope to give any irrigation, even protective or life saving irrigation. In certain areas the total annual rainfall does not exceed 500 mm. The crop production, depending upon this rain, is technically called dryland farming. India has about 47 million hectares of dryland out of 108 million hectares of total rainfed area. Dry lands contribute 42 per cent of the total food grain production of the country. These areas produce 75 per cent of pulses and more than 90 per cent of sorghum, millet, groundnut and pulses from arid and semi-arid regions. The key factors impacting sustainability and environmental protection in rainfed production systems are climate change/variability and poor operational resources. Though many improvements are made in agriculture but has not been able to solve the problems fully under dryland farming.

Sericulture is an agro-based cottage industry in India provides better scope for a high remuneration to the farmers especially from rural India and also act as a potential tool in economic development of our country holding tremendous scope of earning valuable foreign exchange through foreign trade. Mulberry (*Morus alba* L.) is cultivated as one of the main activity in Sericulture as its foliage is the sole food for the silkworm *Bombyx mori*. It is a perennial plant that can be cultivated in different mode in accordance with our requirement so as to produce the highest quantity of foliage to undertake the silkworm rearing in higher rate. Technological innovations are facilitating the farmer to produce higher quantity of quality leaf in irrigated/rainfed conditions.

Presently, mulberry is cultivated in India in 2.45 lakh hectares and generated 25213 MT of raw silk. It is cultivated in different forms for its quality leaf throughout the year. It's grown as tree in temperate regions where as low bush form in most of the tropical regions in varied spacing (plant geometries) such as 60cm x 60cm; 90cm x 90cm and paired row spacing [150+90 x 60cm] by accommodating (approx) 4800 to 10000 plants/acre. Accordingly 250 to 300 DFLs of silkworms can be reared with an estimated raw silk production ranging from 28 to 34 kg. Mulberry leaf production and productivity is limited by the moisture and nutrients. It is known that irrigation increases leaf yield of mulberry plants by about 68%. Leaf mulberry requires 1.5-2.0 litre of water to obtain optimum growth and desired nutritious quality. The gap between water demand and supply is increasing year after year and declining in availability causing a major threat to Sericulture farming.

The climatic changes in the recent years like global warming causes a great concern in Agriculture as it takes away the air moisture and causes poor/erratic rainfall. Due to the prolonged drought stricken atmosphere is prevailing in the country compelling the sericulturists in shrinking the mulberry cultivation and either preventing or reducing the silkworm rearing in summer seasons. The reasons are irregular and inadequate rainfall, down pouring >50% annual rainfall in single or multiple days incurring loss of rain water drowning leading to inadequate groundwater recharge and leaving the recurrence of drought condition for prolonged period. Due to above, it is imperative to develop an alternate system of mulberry cultivation for the sustainability.

Research and developments yielded many technologies to address the water scarcity and farmers are sustained with rainfed sericulture. Many mulberry varieties like, RC1, RC2, S13 S34 are exclusive varieties developed for rainfed cultivation. Tree mulberry cultivation with single stem with 5 feet crown are grown in wider spacing for higher yield in less water. Drip irrigation with controlled water supply and Affordable Micro-Irrigation Technologies (AMITs) etc., are promising technologies for dryland cultivation of mulberry. Slowly the farmers are changing to partial rainfed mulberry adopting either single or multi-stemmed tree farms in wider spacing using the above technologies. Basing on the problems faced by the Sericulturists in the tropical region of Southern India such as water scarcity, non-availability of manpower, high pest incidents due to climatic change, inadequate and poor quality leaf production due to conventional cultivation practices etc. and farmers are either skipping or minimizing the rearing of silkworms.

Under the prevailing above depicted circumstances Tree mulberry cultivation in wider spacing facilitating such as it withstands drought conditions due to its firm tree form and deep root system. Perform well in all seasons even under limited water availability and low rainfall circumstances. Tree mulberry cultivation minimizes manpower drudgery on irrigation and cultivation due to mechanization. It provides uniform quality mulberry leaf ideal for Bivoltine rearing leading to uniform quality cocoon and enhanced market rate. In tree habitat, occurrence of minimum pest & diseases incidence is due to sufficient aeration and resistant. Tree mulberry economises plant wise fertilizers & manure application avoiding wastage. Last but not the least under tree mulberry limited number of plants were planted, maintained will with less water, less drudgery, generated uniform quality of nutritious leaves and more than ten times more biomass per tree compared to the low bush plants. Therefore in the present scenario tree form of mulberry cultivation is going to become the future of sericulture to sustain with the prevailing drought stricken atmosphere and practice the Bivoltine sericulture.

*Currently Director, CSRTI, Mysore - Overall supervision of Research & Development for the development of improved high yielding mulberry and silkworms using conventional and biotechnological approaches. Also leading a team of scientists for developing technologies to enhance silk productivity in the country. He was responsible for transfer of technologies through formulation, appraisal, monitoring and evaluation of developmental projects and schemes. He worked with many projects worked an Investigator and Principal Investigator. He was monitoring Implementation of CDP, SGSY, CSS, North East Action Plan in NE, North East Region Textile Promotion Scheme (NERTPS), Externally funded projects of JICA, Special SGSY, MGNREGS, RKVY and UNDP pertaining to mulberry and non-mulberry sector. He was monitoring World Bank assisted National Sericulture Project (NSP) for development of Mulberry Sericulture in Eastern India. He has 25 National and 21 International research publications apart from he has 10 books/edited books to his credit. He has published 30 popular articles and presented 10 Abstracts. He has published four volumes of Vanya Silk Compendium.