SERICULTURE FOR RURAL DEVELOPMENT STUDIES ON MULBERRY, TASAR AND ERI

By

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Dedicated to
my children Prateek and Saumya
who ungrudgingly bore my absence
and my husband Sanjeev
who contributed through his absence!

CERTIFICATE

This is to certify that the thesis entitled "SERICULTURE FOR RURAL DEVELOPMENT - STUDIES ON MULBERRY, TASAR AND ERI", submitted by Neeru Saluja to the Indian Institute of Technology, Delhi, for the award of the degree of Doctor of Philosophy, is a record of bonafide research work carried out by her. Neeru Saluja has worked under our guidance and supervision and has fulfilled the requirements for the submission of the thesis which, to our knowledge, has reached the requisite standard.

The results contained in this thesis have not been submitted, in part or full, to any other University or Institute for the award of any degree or diploma.

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ABSTRACT

According to an FAO Survey there is a minimum 5 % annual increase at the global level in the demand for silk. Further the value addition in sericulture and silk industry is higher than any other natural fibre. Being a labour intensive industry, sericulture is ideally suited for creating employment in developing countries. The increasing demands in the world market could hence be profitably exploited by the under-developed countries bringing benefits especially to rural areas and help in creating employment for rural women.

In view of this sericulture is being given much attention as an important rural industry in India. Although our country produces four varieties of silk namely mulberry, tasar, eri and muga, most of the work is focussed on mulberry in traditional sectors. Hence, scope exists for propagating sericulture in non-traditional areas choosing the kind of worms and races suitable for a given locality. This also calls for use of non-conventional food plants which may be growing abundantly in an area under consideration. Modifications would also be needed in rearing techniques and equipments such that these can be fabricated from locally available materials.

With this in view, the present study had taken up rearing of mulberry, tasar and eri on a number of alternate biomass as well as conventional biomass as control.

Some new techniques which were tried include bed cleaning of trays with punched polythene sheets and use of polythene bag-method for domesticating the wild tasar silkworm.Use of egg trays and other new types of mountages from local materials proved successful.

To evaluate the effect of rearing conditions and modifications introduced the cocoon characteriatics like cocoon weight, shell ratio, cocoon yield etc. and the physico-chemical studies of fibres were determined based on elemental composition, density, denier, mechanical properties, x-ray studies and Infra-red spectroscopy.

It is concluded that most of the alternate biomass when used as a feed led to slightly poorer quality of fibre as compared to control. However, alternating some of these with primary plant proved useful. A positive impact on fibre properties were seen when the primary food plants were fortified with additives like Vitamin A and metanil yellow.

In recommending any technology it is also of interest to consider the waste utilisation aspect so that better returns are obtained and the pollution of environment by waste is minimised.

The unused biomass plus litter after rearing was used as fertiliser for growing radish (Raphanus sativus L). The production of radish in random plots with waste as fertiliser were compared with plots fertilised with biogas slurry, inorganic fertiliser and control (without any fertiliser). The yield with silkworm waste was better than biogas slurry and significantly higher than that of control. The sericulture waste was also used as substrate for mushroom cultivation. The species used was oyster mushroom (Pleurotus sajor-caju). The yields with different treatments were compared with those on substrate like paddy straw.

Water obtained after degumming of cocoons was used as a binder in soil block making for housing. The blocks were made with diferent compactive efforts. The investigation indicated that when compared to control i.e. water, the addition of degumming water improved the strength of soil blocks.

A techno-economic analysis and time scheduling of operations has indicated that rearing of silkworms could be a home-based industry where women

can find convenient employment. A crucial issue is that the introduction of new technology without imparting training to women results in displacing them even from their traditional employment avenues. Hence, trials on technology transfer was also conducted with a limited number of women to ensure that with some training women can handle all the techniques.

Also, besides giving technical know-how it is important to evaluate the technology in terms of socio-cultural and environmental impacts. In traditional areas where sericulture is already in practice such as Karnataka, Jammu & Kashmir, Orissa etc. the viability as well as compatibility with life style has been established. If only remains to exploit the resources for better returns. However, introducing sericulture in non-traditional areas poses the problem of accessibility and viability. Hence, a field sector in Rajasthan where sericulture started four years ago was taken up for a socio-economic survey on the basis of a detailed questionnaire designed.

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