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STUDY ON THE FEASIBILITY OF ADDITIONAL SILKWORM CROP IN PUNJAB

Shashi Kanta*

S.S.M. College Dinanagar, India

**Author for Correspondence*

ABSTRACT

Silkworm is one of the most important domesticated insects, which produces luxuriant silk thread in the form of cocoon by consuming mulberry leaves during larval period. The growth and development of silkworm is greatly influenced by environmental conditions like temperature and relative humidity. At present only two silkworm crops are being reared in Dhar Block of Punjab. Out of which 65% rearing is being conducted during spring season and remaining 35% in autumn season. The average productivity of spring crop in this area of Punjab. It is about 30K.G. /ozs. In spring season while it is only 20-25 K.G.ozs. In autumn. Keeping above facts in mind it was decided to introduce an additional supplementary crop during summer season in Dhar Block of Punjab. To evaluate the feasibility of this summer crop, a study was undertaken in this area. Different newly evolved silkworm hybrids developed for summer season were used along with the conventional ruling hybrid.

The study reveals the encouraging results with an average productivity range from 30-68K.G.of cocoons /ozs. In this crop, besides, the better productivity than autumn crop, an additional advantage of this crop is automatic pruning of mulberry trees/plants during the month of June at the time of shoot harvest during rearing as brushing date for this crop was in May. It results in the production of quality leaf during autumn season.

The above results indicate that there is a feasibility of an additional silkworm crop in this sericulture zone of Punjab, which needs to exploit it on commercially on large scale.

Keywords: *Summer Silkworm Crop, Pruning, Mulberry Leaf, Hybrid*

INTRODUCTION

Silkworm is one of the most important domesticated insects, which produces luxuriant silk thread in the form of cocoon by consuming mulberry leaves during larval period. The growth and development of silkworm is greatly influenced by environmental conditions (Gowada and Reddy, 2007). The variations in the environmental conditions day to day and season to season emphasize the need of management of temperature and relative humidity for sustainable cocoon production (Siddiqui *et al.*, 2005).

Punjab is predominantly bivoltine silk producing state. The sericulture is being practiced in 7seri Division, Covering 10 Districts in Punjab. At present above 1700 villages covering 8000 farmers are engaged in sericulture activities. The total dui consumption is approximately 4000 ozs. The production is 1.38 lake Kg cocoons and Raw Silk production in 16 MT (2005-06) (Pillai and Krishnaswami, 1980). Dhar block has great potential for development of sericulture. But now in fact Dhar Block alone accounts for above 20% cocoon production of the state contributed by Dhar block. At present the mulberry wealth is in the form of trees of local varieties scattering around the dwelling units, on tanks bunds and along the periphery of agriculture flitted.

At present only two S.W. crops are being reared in this area of Punjab, out of which 65% rearing is being conducted during spring season and remaining 35% in autumn. The farmers are having less agriculture activities during summer in this area which is the last edge of Punjab, at the foothills of Chivalric. It is nearby Himachal and also only way to Dalhousie and Chambal it has environmental conditions similar with the hilly area and suitable for the crop. So it is important to play attention to the additional summer S.W. crop. It is found that after the completion of spring crop up to April new foliage will be available in same mulberry tree/plant by mid of May (Pillai and Krishnaswami, 1980).

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The rearing conditions are congenial for S.W. rearing during May & June. Some hardy adversity tolerant S.W. races showed encouraging results during summer experimental rearing. In general, the early instars larvae are resistant to high temperature which also helps in improving survival rate and cocoon characters (Vijaya *et al.*, 2001). The larval period during summer crop is short in spring & autumn crop. It is found that disease incidence is less during this season because the humidity is always from 30 to 55% which is increased to optimum level by artificial methods (Lakshmi and Chandershekaraiyah, 2007). On commercial scale to exploit the available mulberry foliage and rearing condition which will enhance the total income of the rears and will be helpful to sustain the sericulture contribution in Punjab (Lakshmi and Chandershekaraiyah, 2007). Temperature plays a vital role on the growth of the silkworms. As silkworms are cold-blooded animals, temperature will have a direct effect on various physiological activities (Begum *et al.*, 2008). The additional summer crop may be introduced in this area of Punjab.

MATERIALS AND METHODS

The rears were selected on the bases of rearing houses condition and availability of the leaf. Preparation of chalky rearing at REC level was done as per appropriate technology. Through and proper disinfection was done with recommended disinfectants before commencement of the crop (Begum *et al.*, 2008). The chalky and late age rearing were conducted following the summer rearing practices (Begum *et al.*, 2008). The brushing date for summer rearing was selected on the basis of previous experiments. The rearing was conducted on shelves by giving shoot feeding. To check the diseases infestation appropriate use of bed disinfectant was done (Reddy *et al.*, 2002). The summer specific hybrids with conventional hybrids as control were reared. The local available materials were used for mounting. Sorting of the cocoons was done at the time of harvesting after 5 days (Mishra and Upadhyay, 2002). Factors mainly influence the physiology of insects are temperature and humidity. Despite wide fluctuations in their surroundings, insects show a remarkable range of adaptations to fluctuating environmental conditions and maintain their internal temperature and water content within tolerable limits.

RESULTS AND DISCUSSION

The summer rearing in Dhar Block of Punjab, showed a good productivity ranges from 30 to 60 kg per oz with an average of 43.5 kg per oz [Table no 2]. The cocoons were sold as a green cocoon and the rate of cocoon was at per the rate of spring crop. Visually, the characters of the cocoons were almost same to the cocoon produced during spring season (Deb *et al.*, 2000). The l.p. was shorter than soaring and autumn rearing. The many days utilized during late age rearing were less than that of spring & autumn (Rahmathulla *et al.*, 2006). The overall performance of the rearing was encouraging & satisfactory.

The need of an additional crop was being felt in Dhar block of Punjab to sustain the sericulture and make this culture more remunerative. It was decided to have an additional summer crop by analyzing previous experiments and discussion with state sericulture department. The optimum temperature for normal growth of silkworms is between 20°C and 28°C and the desirable temperature for maximum productivity ranges from 23°C to 28°C (Rahmathulla *et al.*, 2004). These conditions are very much available for this third crop. The temperature requirements during the early instars (I, II, III) are high and the worms feed actively, grow very vigorously, and lead to high growth rate (Kumar *et al.*, 2002; Singh *et al.*, 2009). The additional benefit of this is to utilize the newly sprouted leaf available after spring crop completed on April, which is of use to the sericulture's. The harvesting of the shoots during this crop also helps in automatic pruning of the tree/brushes which gives the better foliage in the autumn rearing (Hussain *et al.*, 2011).

The farmers of this area are having very less agriculture work during this period so that they can attend this crop property (Tyagi *et al.*, 1996). It has been observed that by practicing this crop the farmer will get better remuneration which will make this culture more lucrative and sustainable. It improves farmers economic conditions and generate employment for whole year (Tyagi *et al.*, 1996).

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Table 1: Temperature & R.H. Range during Summer Rearing in Dhar Block Region of Punjab

Year	Temperture Range c	R.H. Range%	Location
2010-11	25°c-30°c (Room) 24°c-38°c(o/s)	30-77%	Bathwan
2011-12	26°c-34c(Room) 24°c-40°c(o/s) °	29-76% 32-50%	Sarti
2012-13	26°c-33°c(Room) 24°c-39°c(O/s)	38-83%	Langera

Table 2

Hybrid CSR ₄ x CSR ₂	Qty Yeild (Oz)	of Seed	Date of Location Brushing	No. of farmers (nos.)	Cocoon of Harvested (KG)	Yield/OZ (KG)
RSJ ₃ X RSJ ₁	3.0		10.05.2011	8	117.0	39.0
ATR ₁₆ X ATR ₂₉	2.0		10.05.2011	5	79.0	35.5
NB ₄ D ₂ X SH ₆	1.0		10.05.2011	2	35.0	35.0
RSJ ₃ X RSJ ₁	2.0		10.05.2012	9	70.55	35.27
ATR ₁₆ X ATR ₂₉	1.0		10.05.2012	5	35.05	35.05
NB ₄ D ₂ X SH ₆	1.0		10.05.2012	4	27.40	27.40
RSJ ₃ X RSJ ₁	2.0		10.05.2013	6	74.0	37.0
NB ₄ D ₂ X SH ₆	1.0		10.05.2013	2	30.0	30.0
ATR ₁₆ X ATR ₂₉	13.0		10.05.2013	4	27.0	32.68
Total	13.0		10.05.2013	41	468.0	36.00

Conclusion

In the present scenario, sericulture is not an attractive occupation in Dhar Block Punjab. Due to practicing 2 crops only with low returns. The addition of one more crops will help to sustain this culture and make this more profitable. The need of the hour is to make this crops popularize on commercial scale through implementing agencies as the period of this crop will not affect the other agriculture crop schedule of the farmer and it will force the reares to take care of the existing mulberry, wealth and increase it by planting the new improved varieties of mulberry. So new crops introduction play very important role.

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