

SILK SEED PRODUCTION IN PAKISTAN

BY

K. M. Siddiqui*

Introduction

Sericulture has been practised profitably in Pakistan for a long time by a large number of rural people. It has, however, not gone beyond a minor cottage industry due to lack of knowledge of modern and scientific techniques for production of commercial silk seed, absence of adequate mulberry plantations, non-existence of local training facilities and constraints in processing and marketing of silk cocoons and raw silk. The prices of cocoons also fluctuate considerably from year to year, thus adversely affecting economic returns to the farmers.

Punjab was the first province to start sericulture in 1947, Azad Jammu and Kashmir in 1951, NWFP in 1952, Balochistan in 1959 (now quiescent) and Sindh in 1976. Major portion of cocoon production comes from the Punjab where silkworm rearing is carried out largely around irrigated plantations on mulberry leaves obtained from full height trees grown for timber.

A number of silk seed grainages were established at hill stations at various places in Pakistan over the years, such as Murree in the Punjab in 1948, Rawalakot in Azad Jammu and Kashmir in 1952 and Parachinar and Khanaspur in NWFP in 1953 and 1962 respectively. But it was not possible to produce hybrid silk seed free from pebrine disease upto now because the practice of silk seed production consisted of production of F₂ seed from the imported F₁ hybrid silk seed. This was not only an improper method but rearing of F₂ silk seed was also contaminating the entire rearing areas resulting in high mortality of silkworms every year. The extent of disease was more than 6 percent which is far higher than international standard which is less than 1 percent.

Silk Seed Production

Silk seed is the basic requirement for development of sericulture industry in the country. In fact the quality of silk seed determines the success of rearing silk worms. Silk seed is highly perishable commodity. Its production, handling and supply, therefore, needs planning and professional competence. In almost every country where sericulture is practised supply of silk seed is controlled by government agencies. At present, almost entire requirement of silk seed in Pakistan is met through imports and the supply of silk seed to the farmers is the responsibility of sericulture wings of provincial government departments of forests. In Azad Jammu and Kashmir, this is done by the Industries Department, (Sericulture Wing). As import of silk seed has been placed on free list, some

*The author is Director General, Pakistan Forest Institute, Peshawar.

private parties are also engaged in importing sub-standard seed and its distribution. The annual requirements of silk seed in the country is 30,000 to 40,000 boxes. The departments were also earlier producing F2 seed locally and meeting the local requirements partially. The local production has however, been totally stopped for the reason mentioned earlier. The following other factors were also responsible for stopping F2 seed production:

- a) Lack of technical know-how
- b) Absence of parent stock
- c) Non-availability of mulberry leaves
- d) High humidity
- e) Too low temperature during night
- f) Power and water shortage at certain places

Research and Training

Considering the importance of research and training, a project on sericulture was started in 1984 in the Pakistan Forest Institute, Peshawar, with the assistance of FAO/UNDP. During the project period of Phase-I, research was conducted and selection of four pure races was successfully carried out to produce F1 hybrid disease free silk seed for the first time in the history of this country. In order to utilize the above research findings, it was considered necessary to formulate a pilot project. For the proper implementation of this project, two sub-stations in Azad Jammu and Kashmir area, one at Pateka for multiplication of parent stock and the other at Chenari for production of seed cocoons and disease free F1 silk seed as well as preservation of all silk seed under natural climatic conditions, were established.

To increase the competence and improve the technical knowledge of local staff especially in the field of silk seed production, several in-service training courses were organized in the Pakistan Forest Institute, Peshawar, and about 44 staff of government agencies and 210 farmers were given special training in parental stock rearing, discrimination of males and females and egg raising.

No silkworm rearing operations had been undertaken at Pateka before April, 1988. The area is free from silkworm disease and is isolated from possible sources of disease infection. Climatically, it is an ideal location in dry zone for parent silkworm rearing and the soil is suitable for mulberry cultivation to obtain quality leaves.

Chenari sub-station was also established in 1988 for production of commercial silk seed. The rearing hall already available were utilized for silkworm rearing of parental



S I L K S E E D P R O D U C T I O N



Moth laying eggs



Silk Cocoon

stock and 10 days old young silkworms were distributed among farmers living around the sub-station. It is estimated that about 300 boxes of parental silk seed can be reared and 2,000 to 3,000 kgs of seed cocoons produced by the farmers in the locality.

Hybrid silk seed production

For the production of the F1 hybrid silk eggs, three steps are necessary. Firstly, breeder stock eggs (P2 eggs or grand parent eggs of F1 hybrids) should be maintained in an active state of productivity and tree breeding so as to retain genetic characteristics. These eggs are normally produced and distributed by the Pakistan Forest Institute, Peshawar. Secondly, parental eggs (P1 eggs or parental eggs of F1 hybrids) are reproduced and distributed by Pateka sub-stations to the farmers in Chenari area. The farmers rear silkworms and produce seed cocoons that are sold to licensed seed producers or to provincial departments. Thirdly, commercial hybrid eggs (F1 hybrids) are produced by the department and/or farmers and sold to the farmers.

Accordingly, every year, Pateka sub-station receives grand parental stock from the Pakistan Forest Institute, Peshawar and multiplies and distributes it among the farmers around Chenari area. In spring 1988, first mass production of parent stock was carried out and to start with 250 Egg Cards of PFI-1 and PFI-2 varieties were produced from the 300 egg layings of each of Japanese and Chinese grand parents received from the Institute. Similarly, in spring 1989, 600 Egg Cards were also produced from 600 egg layings.

At Chenari sub-station, about 250 Egg Cards of parental stock received from Pateka sub-station were incubated and worms fed until 2nd molting in 1988. Thereafter, these worms were distributed among 70 farmers for getting seed cocoons. The farmers produced 860 kgs of seed cocoons which were purchased at the rate of Rs.80/- per kg from which 1,250 boxes of disease free F1 hybrid silk seed was produced and supplied to other provincial departments for distributions among the farmers of the provinces.

In the same manner, in spring 1989, 120 Egg Cards were incubated and worms reared by departmental staff. 360 Egg Cards were also incubated and worms fed until second molting by the departmental staff and distributed amongst 100 farmers. The total production of seed cocoons was to 1,800 kgs from which 2,100 packets of F1 hybrid disease free silk seed were produced during this period.

Future Programme

The above strategy has worked well during 1988 and 1989 and hybrid silk seed of desired quality was produced. Therefore, in future the procedure for seed production is proposed to be as follows:-

Pakistan Forest
Institute, Peshawar

Production of breeder's stock
P3 (germ plasm) and P2 seed. Multiplication of P2 seed and
supply to the provinces.

- Provinces
- Multiplication of P1 seed and its distribution among farmers for production of seed cocoons.
 - Production of disease free F1 hybrid silk seed according to their requirements.

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Accordingly, every year Pakistan sub-station receives grand parental stock from the Pakistan Forest Institute, Peshawar and multiplies and distributes it among the farmers around Chaman area. In spring 1988, first mass production of parent stock was carried out and to start with 250 Egg Cards of PFI-1 and PFI-2 varieties were produced from the 300 egg layings of each of Japanese and Chinese grand parents received from the Institute. Similarly, in spring 1989, 600 Egg Cards were also produced from 600 egg layings.

At Chaman sub-station, about 250 Egg Cards of parental stock received from Pakistan sub-station were incubated and worms fed until 2nd molting in 1988. Thereafter, these worms were distributed among 70 farmers for getting seed cocoons. The farmers produced 800 kgs of seed cocoons which were purchased at the rate of Rs.80/- per kg from which 1,250 boxes of disease free F1 hybrid silk seed was produced and supplied to other provincial departments for distributions among the farmers of the provinces.

In the same manner, in spring 1989, 120 Egg Cards were incubated and worms reared by departmental staff. 300 Egg Cards were also incubated and worms fed until second molting by the departmental staff and distributed amongst 100 farmers. The total production of seed cocoons was to 1,800 kgs from which 2,100 packets of F1 hybrid disease free silk seed were produced during this period.

Future Programme

The above strategy has worked well during 1983 and 1989 and hybrid silk seed of desired quality was produced. Therefore, in future the procedure for seed production is proposed to be as follows:-

1. Production of breeder's stock
2. P3 (germ plasma) and P2 seed multiplication of P2 seed and supply to the provinces.