LIST OF RESEARCH PROJECTS / PROGRAMMES WITH VARIOUS DoT (Seri.) and DoS:

1. Mulberry silkworm race authorization programme (Phase VIII) (All India Coordination Prog. of C.O., Bangalore).
2. Popularization of Authorized Silkworm Hybrids.
3. Field level testing of new hybrids.
4. Post authorization trials of silkworm hybrids in Eastern and North-Eastern India.
5. Improvement of silkworm seed cocoon production at farmers' level with special reference to bivoltine seed cocoon in West Bengal (An extra mural project funded by DST, West Bengal).
6. Validation trial on the superiority of paired row plantation in chawki mulberry garden with regard to leaf yield and cocoon productivity.
7. All India coordinated experimental trial on mulberry (AICEM, Phase – III) (A prog. of C.O., Bangalore).
8. Field evaluation of plant growth regulator combination for improvement of quality leaf yield of mulberry especially under cold stress condition.
9. Studies on the field efficacy of selected dose of insecticide for whitefly management.
10. Study on the efficacy of newly developed bed disinfectant (Sericillin) in hot spot areas for the control of Muscardine disease of silkworm, *Bombyx mori* L.
11. Institute Village Linkage Programme (IVLP) – Phase III.
12. Silkworm Disease Monitoring
13. Monitoring of post cluster activities.
14. Consultancy to DoT (Seri), West Bengal in crisis management.
15. Integrated Skill Development Scheme (ISDS).

I. Mulberry silkworm race authorization programme (Phase VIII)

(All India Co- ordination prog. of C.O., Bangalore).

Duration: January, 2011 – December, 2012

Objective: To evaluate the hybrids developed by various Institutes by testing in 34 test centers (17 Multi x Bi & 17 Bi x Bi) through out India.

DoS involved: West Bengal, Odisha, Jharkhand, Assam, Meghalaya and Mizoram.

Progress made: Co-ordinating, supply of layings, collection and compilation of performance data of eight test centers.

All 30 crops were conducted in case of Multi x Bi crops, where as all 16 crops have been completed in case of Bi x Bi crops.

- The interim analysis indicated that among the multi x bi hybrids tested, M6DPC x SK4C ranked first followed by N x (SK6 x SK7) in West Bengal, Jharkhand, Odisha and Assam
- Among the bi x bi hybrids, (CSR50xCSR52)x(CSR51xCSR53) ranked first in all the states
- Final analysis is in progress.

Test centers:

Kalitha DoT(Seri), Birbhum	RSRS, Kalimpong
Piasbari, DoT (Seri), Malda	RSRS, Koraput
STI, Aizawl, Mizoram	RSRS, Jorhat
Govt. Silk Farm, Shillong	RSRS, Ranchi

Hybrids tested:

Sl. No.	*Multi x Bi hybrids*	*Bi x Bi hybrids*
1	FVB1 x FVB12	AP71 x AP72
2	NDV6 x CSR2	PO3 x ND5
3	ND7 x CSR2	NK2 x HND
4	PM x FC2	CSR50 x CSR51
5	PM x NK2	(AP71.AP9) x (AP72 x AP8)
6	N x (SK6 x SK7	(CSR52.CSR50) x (CSR51.CSR53)
7	M6DPC x SK4C	CSR21DR x CSR28DR
C	PM x CSR2	CSR2 x CSR4
C	N x NB4D2	(CSR2.CSR26) x (CSR2 x CSR27)
Tested	Four times per year	Twice per year

II. BAI (P)-010: Popularization of Authorized Silkworm Hybrids

Duration: September, 2010 – August, 2012

Objective: To popularize the authorized hybrid at farms and farmers' level to increase the productivity with quality silk.

DoS involved: West Bengal, Jharkhand, Meghalaya, Assam and Uttaranchal.

No. of farmers involved: 2600 (12000 dfls)

Progress made:
Achievement:

- As P1 seed 8,150 dfls of M. Con. 1, M. Con.4, B. Con.1, B. Con. 4 were provided to to DoT(Seri), LSP and NGOs.
- From the above, 2, 50, 269 dfls of hybrids viz., N x M. Con.4, M. Con.1 x M. Con.4, M. Con.4 x B. Con.4 and B. Con. 1 x B. Con.4 were prepared and supplied for commercial rearers.
- In addition to the above, from this Institute Multi. x Bi. (3400 dfls) and Bi. x Bi. (450dfls) were directly supplied to the farmers through RSRS and RECs

- **As P1 seed, the yield performance:**
  M. Con.1 : 28-48 kg/100dfls,
  M. Con.4 : 35-50 kg/ 100dfls,
  B. Con.1 : 40-60 kg/ 100dfls and
  B.Con.4 : 45-62 kg/ 100 dfls

- **As commercial hybrids :**
  M.Con.1 x M.Con.4: 35-45 kg/100 dfls,
  M. Con.4 x B. Con.4: 36-45 kg/100dfls,
  N x M. Con.4 : 34-40 kg/100dfls,
  B. Con.1 x B. Con.4 : 52-64 kg/100 dfls**.**

III. BAI (P) 009: Field level testing of new hybrids

Duration: January, 2011 – December, 2012

Objective: To evaluate the performance of two new Multi x Bi hybrids and one Bi x Bi hybrid in the field.

DoS involved: West Bengal, Odisha, Assam, Mizoram, Manipur, Meghalaya and Sikkim.

No.of farmers involved: 100 (4605 dfls)

Technology:

1. M6DPC x D6PN, (Multi x Bi hybrid)
2. M6DPC x (D6PN x SK4C) (Multi x Bi hybrid)
3. D6PN x SK4C (Bi x Bi hybrid)

Progress made:

Two Multi x Bi hybrids viz., M6DPC x D6PN and M6DPC x (D6PN x SK4C) along with Nistari x NB4D2 (control) were tested. In addition, the Bi x Bi hybrid D6PN x SK4C along with NB18 x P5 (control) was also tested. The rearing was conducted during June – September, 2012.

- The hybrids were the outcome of the project AIB 3237.

- The new hybrids recorded more cocoon yield than the control hybrids.

Performance of hybrids tested at farmers' level under test centers namely RSRS, Kalimpong, Koraput, Jorhat, RECs, Imphal, Nabagram, Shillong, M.P.Raj, Bagmara, Rangpo, and Aizawl was compiled.

- M6DPC x D6PN (Multi x Bi.) recorded maximum cocoon yield of 60.5 kg/100 dfls against 51.91 kg of N x NB4D2 (Control)

- M6DPC x (D6PN x SK4C) (Multi x (Bi x Bi.FC) recorded a maximum cocoon yield of 63.50 kg/100 dfls against 51.91 kg of N x NB4D2 (Control)

- D6PN x SK4C (Bi. x Bi.) recorded a maximum cocoon yield of 62.12 kg/100 dfls against 57.13 kg of NB18x P5 (Control)

- The study was conducted at ten test centers (Multi. x Bi. hybrid) and five centers (Bi. x Bi. hybrid).

IV. Post Authorization Trials of silkworm hybrids in Eastern & North Eastern India.

[A prog. in collaboration with NSSO & various DoS(Seri)]

Duration: November, 2012 – December, 2014

Objective:

- To evaluate and popularize the authorized hybrids at the farmers' level in Eastern and North-Eastern India.
- To identify the suitable authorized hybrids for the Eastern and North-Eastern India.
- To recommend the hybrids for the Eastern and North-Eastern zone for commercial exploitation.

DoS involved: **West Bengal, Odisha, Jharkhand, Chattisgarh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim.**

Scheme: II (for testing of Multi x Bi hybrids)

In this scheme, M.Con.1 x B.Con.4, M.Con.4 x B.Con.4 along with the control hybrid, Nistari x NB4D2 will be tested with **1120 farmers** coming under the jurisdiction of 14 test centers.

Scheme: III (for testing of Multi x Multi hybrids)

In this scheme, M.Con.1 x M.Con.4, Nistari x M.Con.4 along with the control hybrid, Nistari x M12(W) will be tested with **970 farmers** coming under the jurisdiction of 9 test centers of West Bengal.

Quantum of dfls required for the programme: 9,76,000 dfls.

No. of farmers involved: 2930 nos.

Budget involved: 80 lakh.

PROGRESS MADE:

- The first trial was initiated with around 75,000 dfls of M.Con.1 x B.Con.4, M.Con.4 x B.Con.4 along with the control hybrid, N x NB4D2 were distributed to **750 farmers** of West Bengal and Jharkhand during Agrahayani, 2012 with date of brushing during first week of November, 2012.

- **The yield performance was:**

  M.Con1 x B.Con4: 63.49 kg/100 dfls
  M.Con4 x B.Con4: 67.20 kg/100 dfls
  N x NB4D2 : 55.15 kg/ 100 dfls

- The second trial is in progress during Spring crop, 2013 with 83,500 dfls of M.Con.1 x B.Con.4, M.Con.4 x B.Con.4 along with the control hybrid, N x NB4D2 with 835 farmers and 41,000 Gen3 x Gen2, SLD4 x SLD8 and NB18 x P5 with 410 farmers during Feb. – Apr., 2013. The collection of yield data is in progress.

V. Improvement of silkworm seed cocoon production at farmers' level with special reference to bivoltine seed cocoon in West Bengal.

Funded by*:* Department of Science & Technology, Govt. of West Bengal, Kolkata (*In Collaboration with:* DoT(Seri) in West Bengal and ZSSO, Malda).

Budget: Rs. 5.29 lakh.

Duration: November, 2011 – October, 2012

Objective: Stabilization and improvement of Bivoltine & Multivoltine seed cocoon crops especially during adverse crop seasons of West Bengal and establishment of model seed rearers.

DoS involved: West Bengal (Seed farmers of 3 villages in Murshidabad district)
No. of farmers involved: 50 nos. (Dfls consumption: 38,275 dfls (10,450 BxB & 27,825 Multi))

Progress made:

1. The project has been completed within the stipulated period utilizing the DST (West Bengal) fund of Rs 5,29,260/-, fully.
2. Compilation of pooled data of five crops each from the three villages i.e. Banjetia, Kalitaladiar and Kiriteswari revealed an average gain of 7kg cocoon/100 dfls over the control. At Banjetia village, the cocoon yield gain was 7.4 kg/ 100 dfls whereas, it was 7.3 kg / 100 dfls at Kalitala Diar village. At Kiriteswari village, 8.4 and 5.2 kg/ 100 dfls cocoon yield gain was in bivoltine and multivoltine respectively.
3. Nine Model Seed Rearers have been selected from 3 villages which will act as motivators to the others.
4. Rearing inputs were distributed as per the Project schedule.
5. All the stakeholders were trained in two batches at this Institute on modern technical know how of silkworm seed rearing.
6. An awareness programme was arranged at Banjetia village during the most crucial Agrahayani seed crop to make the farmers aware about the measures to be taken during high temperature and high humid seasons for successful cocoon crop
7. .
8. One workshop was arranged on 18th October, 2012 at the Institute to get feedback information from the stake holders with participation from D0T(S) & NSSO. The outcome of the project has been highly appreciated by the dignitaries as well as by the farmers.

VI. BPP (VP) 003: Validation trial on the superiority of paired row plantation in chawki mulberry garden with regard to leaf yield and cocoon productivity (In collaboration with: DOT(S) Govt. of WB & ZSSO, Malda)

Duration: October 2010 – September 2012

Importance of the Programme:

- ❖ Chawki rearing is a vital aspect of sericulture industry which in turn decides the survival of worms in late age, their health, robustness and ultimately productivity of quality cocoon crop. The nutritive value of mulberry leaf is a key factor for better cocoon crop.

- ❖ Tender, succulent and nutritious leaves are known to augment the growth and development of young age silkworm which may be achieved by providing necessary agronomic input so as to allow the mulberry plant to express their full genetic potential in the form of both qualitatively and quantitatively superior chawki leaf productions.

- ❖ However, such specific quality leaf production is not possible from a general mulberry garden, as the leaves contain less moisture% and are also poor in nutritional constituents.

- ❖ Keeping this in view, a project PPA 3366 was undertaken to develop a suitable package of practices for chawki garden through paired row system and spaced plantation with a goal to quality and productivity improvement of chawki mulberry leaf which ultimately leads to superior cocoon production.

- ❖ The project depicted the superiority of paired row plantation in terms of both mulberry leaf and cocoon production.

- ❖ The finding of the project is needed to be validated before recommendation, for which the present programme has been taken up.

Objective: Validation of the findings of the project PPA 3366 *i.e* superiority of paired row plantation for chawki mulberry garden.

DoS involved: West Bengal (Akherighata farm, Murshidabad district).

NSSO units involved: P2 BSF, Karnasubarna and P1 BSF Banguria.

Progress:

i. The programme has been concluded during Sept., 12 as per the milestone.

ii. Analysis of pooled data revealed that validation trial conducted at three test centers i.e. P1 BSF, Banguria, Nadia; P2 BSF Karnasubarna, Murshidabad and DoT(Seri) Farm Akherighata, Murshidabad confirmed the findings of the Project PPA 3366 i.e. superiority of paired row plantation [(150 cm + 90 cm) x 60 cm spacing] in chawki mulberry garden with regard to leaf yield and cocoon production in comparison to 60 cm x 60 cm plantation (control).

iii. Leaf yield/ ha/year was recorded *at par* in paired row plantation [(150 cm + 90 cm) x 60 cm] and 60 cm x 60 cm plantation (control) in all the three test centres (16.2 &16.8 mt;

14.5 & 14.9 mt and 15.2 &15.7 mt at P2 BSF Karnasubarna, DoT(Seri) Farm Akherighata and P1 BSF Banguria respectively, although the number of plants/ha was double in 60 cm x 60 cm spacing (27777) against (13888) in paired row system .

iv. Cocoon yield / 100 dfls [32.3 & 28.6 kg (multi); 30.5 & 27.3 kg (multi) and 32.3 & 27.0 (multi) and 53.8 & 48.1 kg (Bi)] was also found significantly higher with paired row plantation [(150 cm + 90 cm) x 60 cm] in comparison to 60cm x 60cm plantation (control) at P2 BSF Karnasubarna, DoT(Seri) Farm Akherighata and P1 BSF Banguria respectively which clearly indicated the superiority of paired row plantation in chawki mulberry garden in comparison to control (60 cm x 60 cm plantation).

VII. All India Coordinated Experimental trial on Mulberry (Phase – III) (A prog. of C.O., Bangalore)

Duration: August, 2011 – December, 2015

Objective: To identify and authorize suitable mulberry variety for commercial use in different agro-climatic mulberry cultivation zones of India.

DoS Involved: West Bengal, Assam, Manipur, Odisha and Jharkhand.

Number of varieties selected by MVAC for the trial: 5

MV1 – C 2038 (CSR&TI, Berhampore)
MV2 - FYT/99-G4 (CSR&TI, Mysore)
MV3 – Suvarna-2 (KSSRDI)
MV4 – Vishala (NC-KSSRDI)
MV5 – V-1 (Mysore) for South and S1635 (Berhampore) for East and North Zones (RC)

For RSRS, Kalimpong and Sahaspur

MV1 – C2038 (CSR&TI, Berhampore)
MV2 - FYT/99-G4 (CSR&TI, Mysore)
MV3 – Suvarna-2 (KSSRDI)
MV4 – Tr-23 (CSR&TI, Berhampore)
MV5 - Vishala (NC-KSSRDI)
MV6-S–146 (Berhampore)

Progress:

- Supply of planting materials of mulberry varieties *viz*., C - 2038, Tr-23 and S-1635 (cuttings) to 22 test centers has been completed.
- Plants are in establishment stage
- Gap filling has been made at RSRS, Koraput, DoT (S.) farm, Ambari Falkata and Boswa
- First pruning has been given at RSRS, Jorhat and survivability study has been initiated

VIII. Field evaluation of plant growth regulator combination for improvement of quality leaf yield of mulberry especially under cold stress condition (outcome of the prog.‘‘**Impact of plant growth regulators to promote photosynthetic activity, leaf productivity and quality in mulberry especially under cold conditions”** conducted during Oct., 09 – Sept., 10).

Duration: December, 2011 – November, 2012

Objective: To confirm the effect of plant growth regulator combination in respect to increase leaf yield and quality of mulberry under cold stress condition.

DoS involved: West Bengal (DoT(S.) farms : Kumarpur and Koshbag in Murshidabad, Kotasur in Birbhum, Sadullapur in Malda and Ranaghat in Nadia).

Technology:

Foliar application of Benzyl adenine (kinetin) + KCl @ 5mg/litre showed best result by increasing mulberry leaf yield to the tune of 40% more over control (water spray) during winter. By foliar application of Benzyl adenine + KCl an extra income of Rs. 5060/- per ha per crop (BC 6:1) can be generated through selling of additional quantity leaf (2.53 mt/ha/crop). With this 300 additional dfls can be reared.

Progress made:

During Feb. and Nov., 12 crops, after 20 days of pruning of mulberry variety S-1635 at 5 DoT(Seri) farms, 1st foliar spray of Benzyl adenine + KCl combination was done and subsequently 2nd spray was given after 20 days of 1st spray. Leaf yield data was recorded. The perusal of data indicated that the increase of mulberry leaf yield was found significant over control, irrespective of locations. The increase in leaf yield was found to the tune of 29.2% (control-3909 kg/ha.,Tr.- 5050 kg/ha.).

IX. Studies on the field efficacy of selected dose of insecticide in whitefly management

Duration: July, 2011 – June, 2013

Objective: To validate the efficacy of selected dose of pesticide in regulating the population of whitefly (Findings emanated from PRE – 3394, "**Studies on the efficacy of some insecticides for management of whitefly and their bio-safety to silkworm, *Bombyx mori* L."**).

DoS involved: West Bengal (Farms at Madhughat, Murshidabad and Nadia districts and 105 farmers of three districts).

Farmers involved : 105 nos. (coverage : 35 acres)

Technology:

From the findings emanated from PRE–3394, "Studies on the efficacy of some insecticides for management of whitefly and their bio-safety to silkworm, *Bombyx mori*", it was found that among three new pesticides tested against whitefly, 0.015% thiamethoxam was found to be effective in suppressing the whitefly population upto 96% till 7th day of spray. The safe period for silkworm rearing was observed as 14 days. The Benefit cost ratio of the technology was 3:1. As whitefly is a serious problem in many parts of West Bengal, a validation programme was taken up to confirm the finding in collaboration with DoT(Seri), West Bengal in their farms and farmers under their command area. Accordingly the study was initiated at DoS farms of Madhughat, Murshidabad and Nadia districts and farmers' fields (105 Nos.).

Progress made:

The study conducted during Bhaduri /Ashwina, 2012 (July – Sept.) and Agrahayani, 2012 (Sept.– Nov.) crop have revealed that during July–Sept., 12, thiamethoxam (0.015%) has reduced the whitefly population to an extent of 93% by 15th day of spray. The yield gain was 27% over untreated plots. In the control plot (0.1% dichlorvos spray) the yield gain was 16%.

X. Study on the efficacy of newly developed bed disinfectant (Sericillin) in hot spot areas for the control of muscardine disease of silkworm, *Bombyx mori* L.

Duration: August, 2010 – July, 2012

Objective: To study the incidence of Muscardine disease of silkworm, *Bombyx mori* in hot spot areas and efficacy of newly developed bed disinfectant (Sericillin) in hot spot areas for the control of muscardine disease of silkworm, *Bombyx mori.*

DoT (Seri) involved: West Bengal, Jharkhand, Chhattisgarh and Manipur

Farmers involved : 488 nos. (Dfls coverage: 65,000)

Technology:

Silkworm Pathology Laboratory has formulated one bed disinfectant called 'SERICILLIN'. It is a synergistic composition for disinfecting silkworm body and silkworm bed, is a mixture of three chemicals. This powder formulation is found effective against Muscardine as well as it is equally effective against all common silkworm diseases such as Grasserie, Flacherie. Sericillin inactivates all types of pathogens of silkworm existing on the rearing bed and silkworm integument and thus prevent secondary contamination. Requirement of Sericillin / 100 dfls of rearing are 4 kgs (cost of 4 kg. is 120/-) ensures an economic gain of around 4 kg more cocoon yield with a Benefit Cost Ratio of 6.4:1.This technology is under process of patenting at NRDC New Delhi (Ref No. IRP/11082-L/2012 dated 18.05.2012).

Achievement:

- In the hot spot zones, for control of muscardine disease sericillin was applied by 488 farmers with around 50,000 dfls.
- Results revealed that average cocoon yield gain over control was 3.00 – 4.16 (11 – 13%) Kg / 100 dfls.
- On an average less than 1% Muscardine was reported against control (20.2%).
- The product has been filed for Patenting at NRDC (IP 650/KOL/2012 dated 11.06.12)
- The product has already been commercialized (dated 06.02.13) and 2 entrepreneurs have paid the license fees to NRDC and will start production from next season.
- Awareness campaigning is being done along with NSSO and DoT(S.) personnel at farmers level.

XI. Institute Village Linkage Programme – Phase III.

Duration: April 2010 – March 2013

Objectives:

- To identify the problems of the target group based on analyzing the existing farming situation of the given area.
- To apply participatory methodologies for solving identified problems and thereby increasing productivity and profitability in a sustained manner.
- To impart training to the target group.

DoS involved: West Bengal, Odisha, Chhattisgarh, Jharkhand, Assam, Meghalaya, Manipur, Mizoram, Tripura, Nagaland and Sikkim.

Farmers involved: 1020 nos. (Mulberry coverage : 525 acres)

Progress made (2012-13):

Irrigated zones (270 farmers under three units):

- During the year 5 crops were harvested. The leaf yield gain in treatment is 10.19 % (40.24 mt/ha) compared to control (36.14 mt/ha).
- During this period, 40000 nos. of M x M dfls were reared with a cocoon yield gain (9.28 %) (27.25 kg/100 dfls) over control (24.77 kg/100 dfls) (Race: N x M12(W)).
- Moreover, 1,15,300 Dfls of M x Bi were reared and the cocoon yield was 40.4 kg/100 Dfls against 36.3 kg (Gain: 10.16 %) (Race : N x (SK6 x SK7) & N x NB4D2).

Rainfed zones (750 farmers under 15 units):

- 3 (three) crops were harvested during the period. The leaf yield gain in treatment is 16.32 % (13.35 mt/ha) compared to control (11.17 mt/ha).
- During this period, 3 (three) commercial crops with 18100 nos. of M x M dfls were reared with a cocoon yield gain of 6.53(%) (25.88 kg/100 dfls) over control (24.19 kg/100 dfls). (Race : N x M12(W)).
- Further, 29522 dfls of M x Bi were reared with a cocoon yield gain of (9.67 %) (40 kg/100 dfls) over control (36.13 kg/100 dfls). [Race: N x (SK6 x SK7)].
- Moreover, 37107 dfls of Bi x Bi were reared with a cocoon yield gain of (13 %) (42.79 kg/100 dfls) over control (37.17 kg/100 dfls). (Race : SK6 x SK7, NB4D2 & HSP x B40*) *REC Shillong

XII. Silkworm Disease Monitoring during Seed and Commercial crop rearing in West Bengal

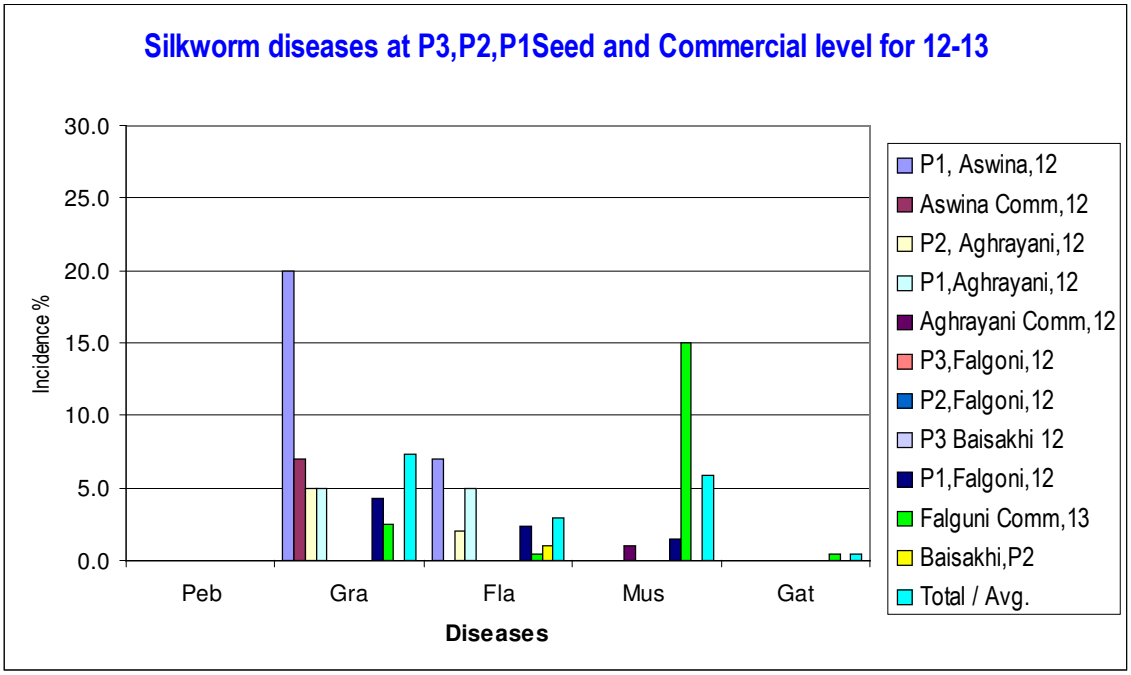
Duration : April, 2012 – March, 2013

DoS involved: West Bengal

Farmers covered: 1098 farmers (64 villages)

Progress :

- 1098 farmers /samples were tested in 64 villages / DOS farms during 8 parental (P3/P2/P1) and 3 commercial rearings throughout the West Bengal



XIII. Monitoring of cluster activities during XII Plan

Duration: April, 2012 onwards

Objective: To impart necessary technical assistance and training to improve the productivity among the 1511 beneficiaries.

DoS involved: West Bengal and Mizoram

Farmers involved: 1511 nos. (661 acres)

During XI five year plan, three cluster promotion programmes (mulberry pre-cocoon) have been implemented through Research Extension Centres under CSR&TI, Berhampore in three locations viz. Nabagram cluster (600 farmers) through REC, Nabagram and Kaliachak cluster (675 farmers) through REC, Mothabari, in West Bengal and Serchhip cluster (232 farmers) through REC, Aizawl in Mizoram in collaboration with DoT (Seri.), Govt. of West Bengal and DoS, Govt. of Mizoram. Based on the above, three separate projects have been prepared with the budget allocation of 322.22 lakh for Nabagram cluster, 314.47 lakh for Kaliachak cluster and 134.70 lakh for Serchhip cluster during XI plan period (2008-09 to 2011-12).

Regular monitoring is being done and necessary technical guidance is being provided by the Research Extension Centres (Kamnagar, Mothabari & Aizawl) in the cluster area by monitoring teams constituted involving DoS officials, lead farmers, representatives from Self Help Groups and NGOs.

XIV. Consultancy to DoS for Crisis Management

Farmers covered: 1500 nos.

Crisis: In eastern parts of India, outbreaks of major pests and diseases viz., thrips, mealy bug, whitefly, Bihar hairy caterpillar, leaf spot, root rot, grasserie, flacherie and gattine are reported during crucial crop periods. During our regular survey and surveillance programmes farmers and extension functionaries are being advised about the control measures, which have to be adopted for the effective management of these pests. But, due to climatic vagaries and leaving the pests unnoticed are the cause for outbreaks of these pests. We provide immediate assistance by visiting the affected areas, and necessary recommendations whenever outbreaks are reported by DoT (S.) and NSSO units in West Bengal.

During 2012 - 13, 40 visits were made in Malda, Murshidabad, Birbhum and Nadia districts of West Bengal covering 1500 farmers.

Villages covered: Panchgram, Alinagar, Balaspore, Budadanga, Qutubpur, Kiriteswari, Khargram and Banjetia (Murshidabad district), Bandhkhala, Bhadrapur, Roypur, Tithidanga, Kalitha, Mokrampore, Kalyanpur, Kundupara, Rameswarpur Mustafadanga, Kanupur and Anantanagar, (Birbhum district), Senpara, Harekrishnapur, Kuchaidanga, Pipulkhola, Kuchaidanga, Tokipur and Banguria (Nadia district), Mossimpore, Sujapore, Bangalgram, Alipur, Shersahi, Trimohini and Alinagar (Malda district) .

Measures suggested:

1) For prevention of disease incidence, thorough disinfection of rearing rooms and appliances, care in disposal of litter and destroy the diseased larvae immediately.
2) The faecal and litter of diseased larvae need to be piled in a manure pit for decomposition; maintenance of strict hygienic condition & proper environmental conditions.

3) Infection of flacherie disease was observed during Baisakhi, 12 crops in Senpara and Harekrishnapur villages in Nadia distrct. The farmers were advised to reduce high humidity of the rearing rooms by letting in fresh air as the silkworms are in the final instar and regular dusting with labex (a silkworm bed disinfectant).

4) For the control of thrips and mealy bug (Tukra), farmers were advised to apply 0.1% dimethoate (safe period: 14 days) and 2% Pongamia oil (Safe period: 10 days). In the initial stages of infestation clipping of tukra infested shoots and subsequent burning is recommended to prevent the spread of symptoms.

5) For the control of Bihar hairy caterpillar control measures were suggested (collection of mulberry leaves with egg masses and early stages of bihar hairy caterpillars and burning them and application of 2% dimethoate with a safe period of 14 days).

6) For the control of whitefly, application of 0.1% dichlorvos was suggested with 14 days safe period.

7) For the control of Bacterial leaf spot, 0.01% plantomycin / pusamycin was recommended (1gm/ 1 liter of water) (safe period: 7 days).

8) For the control of root rot disease, 0.1% Diathane–M (10 grams /plant) should be applied around the affected plants after removing the soil to a depth of 15 cm. (or) Application of RAKSHA (a powder based formulation of *Trichoderma harzianum*) in the soil would be able to suppress the disease.

9) Sudden mortality of silkworms during Autumn P1 seed crop rearing was reported in a farmer's rearing house at Banjetia village, Murshidabad. Reasons found for the sudden mortality of silkworms reared during autumn P1 seed crop was that the neighboring farmers had applied chemical pesticides in the paddy and vegetable fields adjoining the mulberry fields. Due to drift of pesticide, mulberry leaves of the adjoining fields got contaminated. The same leaves were fed to silkworms. As an immediate remedial measure, farmers were advised not to use the leaves of the same field for the ongoing rearing. Farmers were advised to be vigilant, about the pesticidal spray in the adjoining fields. Farmers were further advised to inform their neighbours regarding the silkworm rearing schedules, so as to avoid pesticidal spray during that particular period.

10) Awareness programmes were conducted prior to Spring crop, 2013, for Forewarning Muscardine in Hot spot areas of West Bengal. Farmers were advised to apply Sericillin, an effective bed disinfectant after every moult.

11) Awareness programmes were conducted prior to Summer crop, 2013 (Baisakhi), about Soil test based fertilizer application and Forewarning for management of mulberry and silkworm pests and diseases in collaboration with DoT (Seri.), West Bengal.

XV. Integrated Skill Development Scheme (A training initiative by Central Silk Board & Ministry of Textiles, Govt. of India)

Duration: 2011 -2014

Objectives:

1. To address the trained manpower needs of Sericulture by developing a cohesive and integrated framework of training based on the needs for enhancing the competitiveness of the industry.
2. To increase the employability of residents of the target areas through imparting of skills in the above segments.
3. To cater the range of skill required and simultaneously ensuring sufficient flexibility to meet the needs over a period of the next five years.
4. To create a trainers pool by conducting the advance training programmes.
5. To ensure training in design development programmes which is critical for artisans to help them produce diversified products with innovative uses and improved quality to meet changing market trends.

Budget: 64.27 Lakh.

Training will be imparted to: 900 trainees.

Training will be imparted: 900 trainees (5 years)

Training imparted: 2011-12: 15 nos.

2012-13: 63 nos.

DoS involved: West Bengal, Odisha, Jharkhand, Chattisgarh, Assam, Meghalaya, Mizoram, Manipur, Tripura and Sikkim.

Types of Training Components:

1. Reeling & Spinning
2. Extension Agent
3. Mulberry Cultivation
4. Silkworm Rearing
5. Silk Handicrafts

Mode of selection: Candidates are being sponsored by respective DoS and selected jointly by respective DoS and CSB units.

Progress made: So far five batches of trainings were trained involving a total of 78 (Target : 75 trainees).

1. First batch training was conducted on silk reeling & spinning during 12-3-2012 to 26-3-2012.
2. Second batch training was conducted on skill updation of Extension Agent during 14-5-2012 to 28-5-2012.
3. Third batch training was conducted on cocoon handicrafts during 13.8.2012 to 27.8.2012.

4. Fourth batch training was conducted on mulberry cultivation during 3.10.2012 to 17.10.2012.
5. Fifth batch training was conducted on commercial silkworm rearing during 19.11.2012 to 3.12.2012.
6. Of 78 trainees, 69 were employed / self employed.