

Seri-Success

Through Farmers' Innovations



Central Sericultural Research and Training Institute
Central Silk Board, Ministry of Textiles, Govt. of India
Srirampura, Mysore 570 008

Seri-Success Through Farmers' Innovations

December, 2011
English 200 copies
© CSRTI, Mysore

Published by:

Dr. S.M.H. Quadri
Director, CSRTI, Mysore
Manandavadi Road
Srirampura
Mysore 570 008

Compiled and Edited by:

Dr. Satish Verma
Dr. G.S. Vindhya
Dr. K.S. Chandrakanth
Mr. Mukund V. Kirisur
Mr. J. Justin Kumar

Book Lay-out & Cover

J. Justin Kumar

Printing Support

Mr. Bhimsen Pappu

Printed at

Mahanandikeshwara Commercial Prints,
No. 387, New Sayyajirao Road, Mysore
Ph : 2522017

Seri-Success

Through Farmers' Innovations



**Central Sericultural Research and Training Institute
Central Silk Board, Ministry of Textiles, Govt. of India
Srirampura, Mysore 570 008**

Tel: 0821-2362406, 2362440; Fax: 0821-2362845; e-mail: director@csrtimys.res.in



ईशिता रॉय, भा.प्र.से.
सदस्य - सचिव
ISHITA ROY, I.A.S.,
Member - Secretary



केन्द्रीय रेशम बोर्ड **Central Silk Board**
वस्त्र मंत्रालय **Ministry of Textiles**
भारत सरकार **Govt. of India**



Message

I am glad to note that Central Sericultural Research and Training Institute, Mysore is organizing *Innovative Sericulture Farmers' Workshop* on 16th December, 2011 to give an opportunity to innovative farmers across the southern region of the country to showcase their innovations which have emanated out of their needs while practicing sericulture. I sincerely hope that this event will provide them a very useful platform to interact among themselves and also prove beneficial to other progressive farmers, besides the scientists to come out with meaningful ideas that can help to develop sericulture and silk industry of the country.

I am also happy to know that the Institute is bringing out a publication *Seri-Success through farmers' innovations* on the occasion. I am sure, documenting all the details of these innovations would be useful to all those concerned with sericulture and silk industry.

I wish the workshop a grand success.

Dated: 05.12.2011

[Ishita Roy]

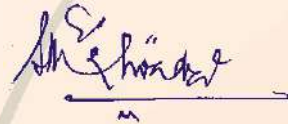
Foreword

Indian Silk industry has registered a phenomenal growth during the last five decades in spite of many a challenges. The R&D efforts leading to development of technologies and their transfer to field through extension activities of the institutes like CSRTI Mysore have played a major role in this achievement and their role becomes more critical towards sustainable production and productivity in sericulture. But more than this, the enthusiasm of sericulturists in adopting the new technologies is laudable. Above all, some of the sericulturists are innovators themselves!

To encourage such innovative sericulturists and to demonstrate, discuss, understand and replicate their innovations among other sericulture farmers across the country, CSRTI, Mysore has taken initiative to organize *Innovative Sericulture Farmers' Workshop* on 16-12-2011. As a part of it, efforts have been made to document the achievements of such innovators in the form of a publication. And here it is *Seri-Success through farmers' innovations*. However it is my sincere duty to make it clear that these innovative creations certainly need to be systematically tested and verified in order to be recommended for adoption by all other stakeholders.

In view of above, I sincerely hope that this publication would be useful for different stakeholders of sericulture and silk industry.

Dated: 09.12.2011



[Dr. S.M.H. Qadri]

Director

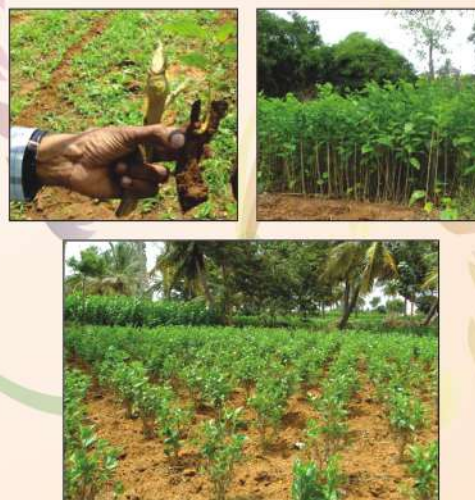
| Innovation | Innovator | Content | Reporter | Page No |
|--|--|---------|--|---------|
| 1. Raising mulberry garden using stumps | Puttegowda, Putta Basavegowda, Basavegowda, Puttaswamy, Puttaswamy | | D.S. Chandrasekhar, Sc-D & R. Gururaj, RSRS Chamarajanagar | 1 |
| 2. Bud removal and training of plant | B. Prakash | | M.T. Himantharaj, Sc-D & A. Umesha, Sc-B REC, Chitradurga | 1 |
| 3. Mulberry with coconut and areca nut | Eswari Jawaguru | | R. Gururaj & D.S. Chandrasekhar, Sc-D, RSRS Chamarajanagar | 2 |
| 4. Raingun to ward off mulberry pests | N. Balaji | | T. Thirunavukkarasu, Sc-C, REC, Gobichettipalayam | 2 |
| 5. Bio-digester | S.V. Rajashekar | | G.V. Kalpana, Sc-C, P4 BSF, Hassan K.B.Chandrashekar, Sc-C, P4 BSF, Hassan Shivanagendra Babu, DD, DOS, Hassan Sreenivasa Shetty, AD, DOS, Hassan | 3 |
| 6. Single wheeled weeder-cum-fertilizer applicator | G. Gurumurthi Setty | | G.V. Prasad, Sc-C, CDC, Palamner | 3 |
| 7. Low cost rearing house | M. Rangaswamy | | D.S. Chandrasekhar, Sc-D & R. Gururaj, RSRS Chamarajanagar | 4 |
| 8. Low cost disinfection tank | Sudam Dhondiram Pawar | | R.L. Katiyar, Sc-C, REC Sub-unit, Aurangabad | 4 |
| 9. Disinfection of the rearing house with microjet | S.V. Rajashekar | | G.V. Kalpana, Sc-C, P4 BSF, Hassan K.B.Chandrashekar, Sc-C, P4 BSF, Hassan Shivanagendra Babu, DD, DOS, Hassan Sreenivasa Shetty, AD, DOS, Hassan | 5 |
| 10. Mobile disinfection units | R. N. Hanumanthu & . Venkatramappa | | T. Mogili, Sc-C, REC, Venkatagiri Kota | 5 |
| 11. Chawki rearing stand | M. Elango Vadivel | | T. Thirunavukkarasu, Sc-C, REC, Gobichettipalayam | 6 |
| 12. Wall mounted humidifier | U. Thangarasu | | T. Thirunavukkarasu, Sc-C, REC, Gobichettipalayam | 6 |
| 13. Room heater run with LPG | R. Venkatramappa | | T. Mogili, Sc-C, REC, Venkatagiri Kota | 7 |
| 14. Chawki leaf cutting machine | Nirmal Kumar Gandhi | | Ishwar, Sc-C, REC Sub-unit, Bidar | 7 |
| 15. Mulberry leaf chopping machine | L. Ramamurthy | | P. Gunasekaran, Asst. Insp. Seri, DOS Arani, TN | 8 |
| 16. Mulberry shoot carrying cart | K. Boobal Krishnan B.K. Manje Gowda | | N.G. Selvaraju, Sc-C, REC, Udumalpet K.B.Chandrashekar, Sc-C, P4 BSF, Hassan G.V. Kalpana, Sc-C, P4 BSF, Hassan Shivanagendra Babu, DD, DOS, Hassan Sreenivasa Shetty, AD, DOS, Hassan | 8 |
| 17. Bed cleaning rods | S.V. Rajashekar | | G.V. Kalpana, Sc-C, P4 BSF, Hassan K.B.Chandrashekar, Sc-C, P4 BSF, Hassan Shivanagendra Babu, DD, DOS, Hassan Sreenivasa Shetty, AD, DOS, Hassan | 9 |
| 18. Silkworm rearing rack transportation trolley | S. Shanmuga Vadivelu | | N.G. Selvaraju, Sc-C, REC, Udumalpet | 9 |
| 19. Feeding stand with wheel | S. Kumar | | N.G. Selvaraju, Sc-C, REC, Udumalpet | 10 |
| 20. Mechanization in shoot feeding system | Shivaji Madho Deshpande | | R.L. Katiyar, Sc-C, REC Sub-unit, Aurangabad | 10 |
| 21. Large rearing house for partial mechanisation | D. R. Sathyanarayana | | T. Mogili, Sc-C, REC, Venkatagiri Kota | 11 |
| 22. Self mounting technique in silkworm rearing | Eswari Jawaguru | | R. Gururaj & D.S. Chandrasekhar, Sc-D, RSRS Chamarajanagar | 11 |
| 23. Worm mounter | C. Prakash | | K.C. Mahalingappa, REC Sub-Unit, Kinkanahalli | 12 |
| 24. Spinning worm transportation box | C. Prakash | | K.C. Mahalingappa, REC Sub-Unit, Kinkanahalli | 12 |
| 25. Gum strip for uzi control | H.G. Gopala Gowda | | DOS, Karnataka | 13 |
| 26. Trouble gum for uzi control | Aswath Narayana Reddy | | P. Samuthiravelu, Sc-C, REC, Hosur | 13 |
| 27. Improved bamboo <i>chandrike</i> | H. Chaitra | | M.V. Chandra, DD, ZP, Chikkaballapur | 14 |
| 28. <i>Netrike</i> Binding Frame | S. Shanmuga Vadivelu | | N.G. Selvaraju, Sc-C, REC, Udumalpet | 14 |
| 29. Folding and packing equipment for <i>netrike</i> | Muttappa Savadi | | DD, DOS, Belgaum | 15 |
| 30. <i>Netrike</i> cocoon harvester | Muttappa Savadi | | DD, DOS, Belgaum | 15 |
| 31. Cocoon cleaning and deflossing equipment | Muttappa Savadi | | DD, DOS, Belgaum | 16 |
| 32. Motorised cocoon deflossing machine | Ramanaidu | | K.C. Mahalingappa, REC Sub-Unit, Kinkanahalli | 16 |
| 33. Deflossing machine for <i>netrike</i> | B.K. Manje Gowda | | K.B.Chandrashekar, Sc-C, P4 BSF, Hassan G.V. Kalpana, Sc-C, P4 BSF, Hassan Shivanagendra Babu, DD, DOS, Hassan Sreenivasa Shetty, AD, DOS, Hassan | 17 |
| 34. Pump for boilers of silk reeling units | Shivaiah | | D.S. Chandrasekhar, Sc-D & R. Gururaj, RSRS Chamarajanagar | 17 |

Raising mulberry garden using stumps

Puttegowda, Devarahally, Putta Basavegowda, Devarahally, Basavegowda, D.K. Hally, Puttaswamy, D.K. Hally and Puttaswamy, Benyamanahally, Hemige, T.N. Pura Tq.



In Halagur hobli of Malavalli taluk, most of the sericulturists are practicing shoot rearing. For them, the seed material for raising mulberry plantation with 6-8 month maturation is not readily available. The non-availability of the seed material has been a limiting factor in extending mulberry acreage. However the farmers are practicing thinning of crown in mulberry garden once in 2-3 year. The stumps thus removed are utilized for raising saplings on nursery bed. This innovative method practiced by these farmers is proved to be successful. The stumps which are a waste material after thinning are effectively used for raising sapling and also bringing in additional revenue to the farmers. The saplings raised from these stumps have 100% survival rate and can be utilized for plantation after 2-3 months. The saplings thus raised are sold at the rate of Rs. 2/- per sapling.



Bud removal and training of plant

B Prakash, Nandanahosur, Holkere Taluk, Chitradurga District, Pin 577 557
Contact +91 9379039345



Sri B Prakash has 2.5 acres of mulberry with wider spacing and drip irrigation. For the purpose of maintaining and optimising the yield potential of the plants he made a novel approach of removal of unwanted buds and retaining 10-12 buds, after 15-20 days of pruning. This approach has certain advantages like –

- Easy to remove the buds than the side branches in later stages.
- Need 4-5 mandays/acre for bud removal against 8-10 mandays/acre for thinning of side branches after 30-35 days of pruning.
- Good aeration and better sunlight to the plantation.
- Wastage of inputs such as water, fertilizer, manure, etc., are minimized.
- Less incidence of pest and diseases of mulberry.
- Improvement of leaf quality.



Mulberry with coconut and areca nut

Eswari Jawaguru, Mathe Mill Thota, Dollipura Villagae, Attugulipura Post, Chamarajanagar District, Pin 571 127. Contact No. +91 9443143993



Smt Eswari Jawaguru has three acres of mulberry garden with V1 variety under 3' x 3' spacing. She had established arecanut as well as coconut plantation as intercrop in her mulberry garden. For the management of mulberry she had made long trenches of 2' depth in between the rows and applies available coconut/arecanut fronds besides dumping the sericulture wastes and allowing them for *in situ* vermi-composting. She irrigates the garden for three hours once in three days through drip system and no chemical fertilizers or FYM are applied. She utilizes mulberry shoots for silkworm rearing and harvests successful crops throughout the year. The average cocoon yield is around 70-75 Kg per 100 dfls and brushes 250-300 bivoltine pure/hybrid dfls every month.



Raingun to ward off mulberry pests

N. Balaji, Dasampalayam, Gobichettipalayam, Gobichettipalayam (Tk), Erode District

Sri N. Balaji practices sericulture in nine acres and brushes 1,200 to 1,500 bivoltine hybrids every month and records an average yield of 65 kg/100 dfls. He introduced rain gun irrigation in mulberry garden to overcome labour shortage and water scarcity. It has an added advantage of washing away dust and protects the plantation from infestation of sucking and chewing pests. When most of the mulberry gardens infested with papaya mealy bug in 2009, there was almost no infestation in his plantation. The raingun are of two types, an indigenous and an Italian make. The cost ranges from Rs. 3,000 to 13,500/-. The spraying capacity ranges from 75' to 150'. For effective irrigation/wetting of 1.00 acre mulberry garden, the rain gun has to be operated for half-an-hour per day. The cost of installation of rain gun for one acre is Rs.1.25 lakh.



Bio-digester



S.V. Rajeshekar, Yalaganahalli, Karjuvalli Post, Alur Taluk, Hassan District Pin 573 213. Contact No. +91 9844700383

Sri Rajashekar's Bio-digester comprises of 20 x 10 (L x B) and 6.5' high cement tank and partitions made in between. In the centre wall, there are square shaped holes to facilitate movement of liquid manure. These holes can be closed with an iron sheet attached to a 7 feet iron rod. These tanks are constructed near the gober gas plant. All the farm and rearing wastes are chopped finely and filled into this cement tank along with water. The slurry is also poured over this with the help of a pipe. The whole thing is left for one month to digest. After one month when the steel sheets are pulled, the liquid manure flows to the next cement tank. The undigested material is put to the manure pit and covered with soil. This liquid manure is pumped to the mulberry garden after filtering.



Single wheeled weeder-cum-fertilizer applicator



G. Gurumurthi Setty, Eduru village, Dandapalli Post, Gangavaram Mandal, Chittoor Dist (AP), Pin 517 408, Contact No. +91 9849126223



The weeding machine can be manually operated. It consists of a metallic frame to which a weeding blade (18" wide with adjustable angle) and a fertilizer applicator are attached at one end and a light weighted bicycle wheel of 50 cm diameter on the other end. The weeding unit can be push-moved on the single wheel with both hands, allowing the blade to penetrate the soil surface. Provision is also made to align a fertilizer container, which can deliver the desired quantity of fertilizer to the soil during the process. The design of this weeding unit is very simple and can be set up and assembled easily. The blade width and angle are adjustable depending on the height and strength of the person operating it. Cost of the unit is Rs. 1,500/-.

Low cost rearing house

M. Rangaswamy, Honnur Village,
Yelandur Taluk, Chamarajanagar District



Sri Rangaswamy has constructed a low cost rearing house with an area of 50' × 30' with thatched wall and roofing, using coconut leaf and bamboo poles. The rearing house provides good ventilation with bamboo construction. The rearing house is covered all around with nylon net to protect from uzi infestation. The farmer has made racks for carrying out shelf rearing. This rearing house is made of locally available raw material and can be termed eco-friendly. The entire construction of the shed including construction, materials, shelf rearing stand had cost him Rs.40,000/-.



Low cost disinfection tank

Sudam Dhondiram Pawar, Rui Dhanora, Gevari Tq, District Beed.
Contact No. +91 9823499894

Disinfection plays a key role in the successes of silkworm crop. Besides rearing house, the rearing appliances are required to be disinfected. For this a cement tank of 6' × 4' × 3' (L×W×H) is recommended. In order to minimize the cost and serve the purpose, Sri Sudam Dhondiram Pawar, a CPP farmer has made a low cost disinfection tank by digging a pit of 6' × 4' × 3' and over laying it with a plastic sheet of 20' × 20' (double fold) inside the pit. It can be filled with 1,500 litres of bleaching powder or Ashtra solution and dip *chandriks* and trays. At a time 100 plastic *chandriks* or 20 trays can be disinfected. This tank costs about Rs.300/- only, for Rs.100/- for digging and Rs.200/- for plastic sheet.



Disinfection of the rearing house with microjet



S.V. Rajeshekar, Yalaganahalli, Karjuvalli Post, Alur Taluk, Hassan District Pin 573 213. Contact No. +91 9844700383

A traditional bivoltine rearer, Sri Rajeshekar has been practicing sericulture for the last 21 years. With his 2.5 acres mulberry garden and rearing house he has been rearing bivoltine with 85 kg per 100 dfls average yield. He has two 60' x 23' rearing houses. He has fixed drip irrigation pipes below the roof and operates them through main pipe attached to a 2HP motor. This motor pumps the disinfectant solution through this pipe line and the jets in the pipe sprinkle the disinfectant solution all over the rearing house. The whole process takes about five minutes. One person can disinfect the rearing house of 60' x 23' x 15' capacity effectively. Exposure to disinfectants can be avoided. More effective disinfection when compared to motorized disinfection.



Mobile disinfection units



R. Venkatramappa,
V. Kota, D.No. 6-296, Narayanagar Chittoor Dist.,
Andhra Pradesh-517 424, Contact No. +91 944160061

R. N. Hanumanthu,
D. No. 3-1511, School Street, Mandal V. Kota, Chittoor Dist.,
Andhra Pradesh-517 424, Contact No. +91 9094928466



Non affordability of power sprayers, transportation of hired sprayers and arrangement of bigger vessels for preparation of solution were limiting factors for perfect disinfection. These progressive sericulturists made a **Mini-tractor Mobile Disinfection unit**. The innovators fixed a high capacity sprayer, 200 L container, 50 m flexible pipe on to an 18.5 HP mini-tractor. After seeing the success of it they made the **Improved Mobile Disinfection Unit** was devised. It consists of a 35 HP Jeep engine, high pressure 3 piston sprayer discharging 10-15 liters of solution per minute up to the height of 20 meters, two water containers of 200 L capacity for preparation of disinfectant, 50 meters flexible pipe, buckets and filters. The spray is powerful and hence can reach all the nooks and corners of the rearing house and appliances and kills the pathogens more effectively as compared to traditional methods. These units are available on hired basis to sericulturist for disinfection.



Chawki rearing stand

M. Elango Vadivel, Elango Seri Farm, Sellakumarapalayam, Polavakalipalayam, Gobichettipalayam Taluk, Erode District, Pin 638 476. Contact No. +91 9443940103



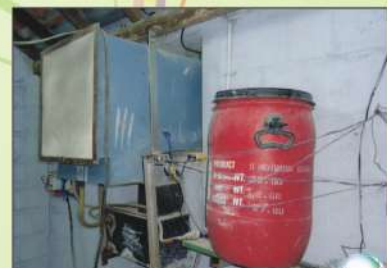
Sri M. Elango Vadivel has been taking up chawki rearing by brushing 25,000-30,000 dfls once in 10 days. The high temperature and humidity prevailing in his area has posed problems during chawki rearing. Towards finding a solution to this problem and to provide required conditions in the chawki tray and facilitate proper bed drying, the trays are kept in a suitably modified chawki rearing stand made of PVC pipes, which can accommodate adequate number of trays to brush 25 to 30 thousand dfls. The trays are kept open after feeding with mulberry leaves, without covering as in practice. The narrow distance between trays help in maintaining the quality of feed without cover. This chawki rearing stand made up of PVC pipes is user friendly, non-corrosive and easy to handle.



Wall mounted humidifier

U. Thangarasu, Sanjai Seri Farm, Thanneerpandal Pudur, Kugalur (PO), Gobichettipalayam (Tk), Erode District, Pin 638 313. Contact No. +91 9842855662

Sri U. Thangarasu runs a CRC since 2005 for supplying quality chawki worms. He has 3.5 acre of V1 mulberry garden and 50% of his rearing is CSR hybrids. The monthly brushing of the CRC ranges from 20,000 to 25,000 dfls in three batches. During summer season, due to low atmospheric humidity, high temperature and less moisture content of leaves, the leaves dry quickly and become unpalatable to silkworm, leading to unhealthy larvae. As he could not maintain optimum humidity with the existing basin type humidifiers, he devised and erected a wall mounting type humidifier which uniformly disperses water vapors in the entire rearing room. Depending up on the fluctuating atmospheric temperature and humidity, the humidifier is operated twice or thrice in a day for one hour duration. The water consumption is 4 - 5 litre per hour.



Room heater run with LPG



R. Venkatramappa, V. Kota, D.No. 6-296, Narayanagar, Mandal V. Kota, Chittoor District, Andhra Pradesh 517 424, Contact No. +91 944160061

In V. Kota area the temperature remains low for almost six to eight months in a year. Electric room heaters or smoke less charcoal furnaces are used for maintenance of temperature in rearing houses and Chawki Rearing Centres. Non-availability of charcoal and frequent power cuts necessitated for alternate methods. Sri R. Venkatramappa improved the heater working with LPG to maintain temperature in the CRC. A motor cycle rim attached to an iron rod (five feet) and a dome-shaped aluminum fitting attached is connected with a gas burner. A regulator is attached at the neck of the cylinder and another one near the dome to regulate the gas release to the burner. For a 20' x 50' building, two such heaters are needed. Temperature can be raised by 4 to 5 degrees within 15 minutes. Dependency on the electricity and charcoal is avoided. It costs around Rs. 4500/-.



Chawki leaf cutting machine



Nirmal Kumar Gandhi, Siddhanth Irrigation and Engineering Co., Sindol Complex, Opposite to water tank compound, Gandhi Gunj, Bidar 585 403, Contact No. +91



Sri Nirmal Kumar Gandhi has fabricated chawki leaf cutting machine and sells this to the needy farmers through his firm. He is supplying the machine since last five years along with suitable technical guidance to operate it. He has supplied around 500 machines so far. The cost of the machine depends on the weight, which in turn is as per the requirement of the farmers. A 4 kg machine is ideal for cutting leaf for 100 dfls chawki worms, (Cost Rs. 1650/-), 6 kg machine for 300 dfls (Cost Rs.2460/-), 10 kg machine for 800 dfls (Cost Rs. 3350/-) and 16 kg machine for 1,600 dfls (Cost Rs. 4450/-). The machine as such can be used manually or by attaching an 1 HP motor. The machine saves the time and labour.



Mulberry leaf chopping machine

L. Ramamurthy, Yogalakshmi Chakwi Centre, Chettithangal Village, Sirumur Post, Arani taluk, Thiruvannamalai District, Pin 632 314.



Fabricated by Sri L. Ramamurthy for the chawki rearing centre, this mulberry leaf chopping machine can be operated by hand or using a motor. It is being used for chopping mulberry leaves for chawki rearing. While required quantity of leaf can be chopped manually in one hour for the worms of 2,000 dfls, this machine with motor can chop the same quantity within 20 minutes thus saving time and labour. A knob is provided in the machine to adjust the cutting size of leaf as per the requirement. The total cost of the machine is around Rs. 4,300/- including the cost of an electric motor.



Mulberry shoot carrying cart

K. Boobalakashnan, Pappankulam, Madathukulam Tk, Udumalpet, Tiruppur Dt, Pin 642 204. Contact No. +91 9865646697

B.K. Manje Gowda, Beladagere grama, Dandiganahalli Hobli, Chennarayapattana Taluk, Hassan District. Contact No. +91 8971618112

Chosen as a best bivoltine rearer during 2009-10 under CPP Udumalpet, Sri K. Boobalakashnan has been practicing sericulture since 2005. He requires around 2,500 kg of mulberry shoot per day during the 5th instar. To overcome the manpower shortage and the difficulties faced by the women workers in lifting and carrying the shoot from mulberry garden to rearing house, he fabricated the leaf carrying cart, by using two old motor cycle wheels.



Similarly, Sri Manje Gowda, who is practicing sericulture for the past 10 years has devised another type of mulberry shoot carrying cart for reducing drudgery and to maintain hygiene. He moves the mulberry shoots within rearing house using this cart, thereby contact with the floor is avoided thus maintaining the hygiene in the rearing house.



Bed cleaning rods



S.V. Rajashekar, Yalaganahalli, Karjuvalli Post, Alur Taluk, Hassan District Pin 573 213. Contact No. +91 9844700383

Sri Rajashekar, cleans the rearing beds using TMT iron rods during 3rd, 4th and 5th instars. Besides he can also lift the cocoons along with the mountage and clean the bed. This saves a lot of labour. Earlier 15 labourers were required for this job and now because of this practice, only 6 labourers are required to clean the beds of 650 dfls. However, instead of iron rods, bamboo, or other sticks can also be used for this purpose.



Silkworm rearing rack transportation trolley



S. Shanmuga Vadivelu, Chinnaveeranpatty, Pukkulam PO, Udumalpet Taluk, Tiruppur District, Pin 642 154. Contact No. +91 9842361035



Sri Shanmuga Vadivelu is practicing sericulture for the last 15 years and reares around 500 Dfls per month. Carrying the rearing waste from two separate rearing houses to the pit was a problem for him. To overcome this, he devised a rack transportation trolley. It has four old scooter wheels with an iron frame of 10' × 3' size, weighing around 25 kgs, fitted on it. With a rotavator, it can be turned 360°. The cost is around Rs.8000/- and lasts for 5 years. It has the following advantages –

- Saves 6 mandays per batch, thus saving Rs. 1800/-.
- It can be brought directly and pulled under the rack.
- By dismantling the rack with waste, all the five racks in a layer can be kept in the trolley at a time.
- It can be pulled out and taken to the waste pit with power tiller/tractor/TVS 50 or manually
- After unloading, rack can be kept for sun drying.



Feeding stand with wheel

S. Kumar, Chinnaveeranpatty, Pukkulam PO, Udumalpet Taluk, Tiruppur District, Pin 642 154. Contact No. +91 9715645587



In Udumalpet area of Tamil Nadu, the sericulture farmers follow shoot rearing method with 4 to 5 tier racks. They use wooden stools to climb up and feed the worms from 3rd rack onwards. Every time the farmer has to get down and move further which has been a drudgery. To overcome this problem, Sri Kumar, who is practicing sericulture for the last 5 years, has devised a stand. The stand is made of iron and wood, fitted with four wheels with ball bearing. Four steps are made on either side. It has a total height of around 4'. The advantages are -

- It can be moved freely in the rearing house.
- Mulberry shoots can be kept in the upper step.
- At a time two persons can feed the silkworms.
- Saves 4 mandays to feed during final stages.
- It can be used for five years.



Mechanization in shoot feeding system

Shivaji Madho Deshpande, Satargaon, Akola dist, Maharashtra
Contact No. +91 7798060511

Sri Shivaji Madho Deshpande, a progressive farmer started sericulture in 2008 and has 11.50 acres of V1 mulberry plantation. He constructed a rearing house with the dimension of 105' L × 31' W. Inside he erected 20 racks in three rows of 5' W × 100' L. Though the rearing capacity is 1,000 dfls, due to labour problems he could rear only 700-800 every time. To this problem and feed the worms in time, he devised a trolley of 5' × 8' with two tiers, where shoot can be stored and a person can sit and feed worms properly on the 5th & 6th rack. The trolley with wheel moves on the steel track provided. The rubber wheels are fitted with brakes to have proper control. Similarly, a ground trolley of 3' × 5' is also used to feed 2nd, 3rd & 4th tier worms. This innovation cost about Rs.15,000/-.



Large rearing house for partial mechanisation



D. R. Sathyanarayana, Post: Dasarlapalli, Mandal -V. Kota, Chittoor District, Andhra Pradesh-517 424, Contact No. +91 9652292341

With 18 acres of V1 mulberry with paired row system, availability of CRCs to supply healthy chawki worms, mobile disinfection units to facilitate disinfection and good returns from sericulture, Sri D. R. Sathyanaraya has constructed a large rearing house to rear 1,200 to 1,400 dfls per crop with a facility to move a tractor with trolley in between the rearing stands for easy transportation of mulberry shoots and movement of tractor for removal of bed refuse. The facilities are -

| | |
|---------------------|-------------------------------|
| Rearing house | : 161' x 28' |
| Shoot rearing stand | : 1680 sq.ft (6' x 140' x 2') |
| Rearing bed area | : 10,080 sq. ft |
| Passage | : 9' |
| Cooling system | : Through pipes |
| Leaf preservation | : Two rooms |
| Mounting facility | : Veranda (9' x 120') |



Self mounting technique in silkworm rearing



Eswari Jawaguru, Mathe Mill Thota, Dollipura Villagae, Attugulipura Post, Chamarajanagar District, Pin 571 127 Contact No. +91 9443143993



Smt Eswari Jawaguru is a silkworm seed crop rearer, who rears 200-250 bivoltine pure as well as hybrids per batch. She has a separate rearing house (50' x 23') and has adopted shoot rearing. She has sufficient plastic chandrikes (*netrikes*) for mounting of mature silkworm but does not have a separate mounting hall and other devices for mounting the spinning larvae. In her innovative method, she spreads *netrikes* on rearing bed and each one is supported with two coconut frond, ensuring minimum handling of silkworm and resulting in more hygiene in the bed. When all the worms get self mounted and complete the spinning, the farmer lifts the *netrike* above the rearing bed with the sticks and ties them above the rearing bed. This method reduces the drudgery and 10-12 mandays are saved. The quality of cocoons are improved and defective cocoons is less.



Worm mounter

C. Prakash, Kamagere, Kollgal Taluk, Chamarajnagar District
Pin 571 443, Contact No. +91 9902446366



The farmers with rotary mountages have the difficulty of mounting the spinning worms on the mountages. The recommended practices are sometimes time consuming and cumbersome. To overcome this difficulty, Sri Prakash has devised a worm mounter. It is made of light wood with plastic handle which pushes the spinning worms on the rotary mountage. At a time, 150 worms can be mounted, whereas one cardboard hive contains 156 cells. It is a long lasting device that saves labour and time. The cost of the device is Rs.200/-



Spinning worm transportation box

C. Prakash, Kamagere, Kollgal Taluk, Chamarajnagar District
Pin 571 443, Contact No. +91 9902446366

There are instances, wherein the rearing house and mounting halls are situated at some distance. Usually farmers collect the spinning worms in any container and transport the same to the mounting place resulting in the loss of silk and deterioration in cocoon quality. To overcome this problem, Sri Prakash has devised a spinning worm transportation box. He joined two plastic boxes of size 1.5' x 1' x 4" and made holes on either sides of the box for aeration. It accommodates 2500-3000 worms and costs about Rs.250/-.



Gum strip for uzi control



H.G. Gopala Gowda, President Siri Raythra Koota, Hithalahally, Sidlaghatta Taluk, Chikkaballapur District, Pin 562 105. Contact No. +91 9448138397; 08158-256397

Sri Gopala Gowda has 8 acres of mulberry and rears 900-1,000 dfls. For controlling uzi menace, he has adopted a uzi trap. It consists of a cardboard strip measuring 4" x 10", smeared with rat poison and gum over it. He hangs these strips near the windows and doors of the rearing house. The uziflies trying to enter the rearing house get attracted by the yellow colour of the strip and trapped there. Once 20-25 flies are trapped, he picks them and destroys by burning in a flame or burying them in the soil. A rearing house of 15' x 20' dimension needs about two such strips. He claims that this technique controls 80-85% of uzi menace. The cost is working out to be Rs. 35/- per card board strip.



Trouble gum for uzi control



Aswath Narayana Reddy, Kodiyalam village, Hosur taluk, Krishnagiri District, Pin 635 102. Contact No. +91 9448312848



Sri Aswath Narayana Reddy has 8 acres of V1 mulberry plantation and a separate rearing house. He raises 10 silkworm crops per year and harvests 75 kg cocoon/100 dfls. For controlling uzi menace, he adopted an innovative idea of using Trouble Gum, since last two years. This technique has significantly reduced uzi menace. He obtains the trouble gum (glue) from dealers of Pest Control of India, at the rate @ Rs.35/- per tin. Each tin is sufficient to glue two round sticks or iron rods (size 8') for three feet long. Two to three such sticky rods are kept near each window of the rearing house in slanting position during the course of rearing and even after that. Uzi flies while attempting to enter or resting gets struck to the rod and are perished. By scrapping with a knife or by slight melting on flame, these rods can be reused to stick fresh gum for the next rearing.

Improved bamboo chandrike

H. Chaitra, Muddareddyhalli, Varalakonda Post, Peresandra (Via), Chikkaballapura District, Pin 562 104



To mount the larvae into the traditional *Chandrike* involves lot of labour such as picking up the larvae and mounting onto them. It needs more space and urination is a problem. When they are stacked the aeration to the spinning larvae become a problem. To avoid this the farmer has devised a *chandrike* without the support of the mat. This is supported by plastic moutage in place of bamboo mat. These mountages can be placed on the rearing stand and the ripened worms climb over this within 20 minutes. After this it can be shifted to a convenient place. The advantages are –

- Labour requirement is reduced
- Easy to handle due to low weight
- Though the size is less, it can hold the same number as that of standard *Chandrike*.
- Better aeration ensures cocoon quality
- Easy to harvest cocoons
- Costs less (Rs. 300/-) than traditional *Chandrike* (Rs. 500/-)



Netrike binding frame

S. Shanmuga Vadivelu, Chinnaveeranpatty, Pukkulam PO, Udumalpet Taluk, Tiruppur District, Pin 642 154. Contact No. +91 9842361035

For mounting 500 dfls worms Sri Shanmuga Vadivelu is using 750 *Netrike*. And for binding *Netrike* manually, he used to spend for 5 man days. Due to man-power constraint, cleaning of the *Netrike* was done just before spinning of the larvae. Due to the prolonged exposure to sunlight after the previous crop, the *Netrike* loose the tension and after cleaning and binding, they do not get to the original shape and size. Because of this, the cocoons obtained were of varying shapes. To overcome these problems he devised a *Netrike* binding frame. The advantages are -

- While binding uniform pressing is given.
- Can be tied in 2 or 3 places by thread.
- Keeps the *Netrike* in proper shape.
- Reduction in labour and cost.
- Due to good quality cocoons, better rate is realised.



Folding and packing equipment for *Netrike*



Muttappa Savadi, Khanahatti, Gokak Tq, Belgaum District
Contact No. +91 9449248814, +91 8147467154

Sri Muttappa Savadi has 2 acres of V1 mulberry plantation and separate rearing house. He is practicing sericulture for 25 years. For the mounting of larvae he uses *Netrike*. For the purpose of retaining the proper shape of the *Netrike* he devised a folding and packing equipment. The simple machine is made with locally available materials. A wooden frame is fixed on four wooden legs. A moving and adjustable frame is pressed over the plastic chandrikae after keeping on the base frame to hold it in place. With the help of a bicycle pedal connected via a thread to the frame makes the plastic *Netrike* fold in between two wooden blocks and a groove is provided in the wooden block to draw the thread to tie the plastic *Netrike*. This process keeps the *Netrike* in folded condition for any length of time. The instrument costs only Rs.1,600/-.



Netrike cocoon harvester



Muttappa Savadi, Khanahatti, Gokak Tq, Belgaum District
Contact No. +91 9449248814, +91 8147467154



Though *Netrike* is being widely used for mounting spinning larvae, harvesting of cocoons from these plastic mountages is cumbersome. As a solution to ease out harvesting of cocoons from plastic mountages, Sri Muttappa Savadi has innovated an implement, which is very simple, user friendly and cost effective. He fixed U shaped metallic rods into a wooden frame, which when rotated against the plastic moutage containing cocoons, harvests the cocoons very effectively and easily making a forward movement of the moutage. By reversing the moutage and operating once again, the cocoon harvesting is completed within a short period. It saves time, cost, and drudgery involved in manual harvesting. It takes only two hours to harvest cocoons from 100 such mountages. The cost of the equipment is Rs.1,500/-



Cocoon cleaning and deflossing equipment

Muttappa Savadi, Khanahatti, Gokak Tq, Belgaum District
Contact No. +91 9449248814, +91 8147467154



Before bivoltine cocoons are marketed, they need to be cleaned and deflossed. For this purpose, Sri Muttappa Savadi fabricated a simple device which is manually operated. A wooden frame with four legs are fixed and erected. The wooden frame is fixed with metallic wire mesh and to one end of the device a cycle wheel rim is connected to a small wheel just like a charkha. The other end is connected with the cycle pedal, which makes it to move the cocoons placed on the wire mesh towards lower end, wherein it has to pass through a metallic rod, that makes it possible to get the cocoons deflossed. The device is effective, economical and can be made locally.



Motorised cocoon deflossing machine

Ramanaidu, Hanur, Kollgal Taluk, Chamarajnar District
Pin 571 439, Contact No. +91 944858707

In order to overcome the drudgery and to minimise the cost of labour Sri Ramanaidu has developed a cocoon deflossing machine. It can defloss 100-150 kg cocoons per hour. It is a simple machine fabricated using locally available material. The machine is attached to an 1HP motor. The cost works out to be less than 10 paise per kg for deflossing cocoons. The machine costs around Rs.10,000/-.



Deflossing machine for *Netrike*



B.K. Manje Gowda, Beladagere grama, Dandiganahalli Hobli, Chennarayapattana Taluk, Hassan District. Contact No. +91 8971618112

Earlier deflossing of netrike was being done using 3% bleaching powder solution. But in this deflossing machine, a steel rod is fixed to a half HP motor. The steel rod in turn is attached with plastic threads which rotates and takes out the floss from the chandrke. About 95% of the floss is taken out with the help of this machine. The remaining 5% of floss is burnt with a flame gun. Deflossing of chandrke by this method will help them last longer.



Pump for boilers of silk reeling units

Shivaiah, Honnur Village, Chamarajanagar District, Pin 571 440, Contact No. +91



Sri Shivaiah owns a reeling unit at his native, Honnur. He had been experiencing power failure which indeed has obstructed his reeling work. To overcome this problem, he devised a hand pump by using a pulley and connecting it to the wheel of a bicycle using a rope. When the cycle is pedaled, the motor works and water is pumped to the boiler. It costs Rs.400/- and already eleven reelers have adopted this technology.

Central Sericultural Research and Training Institute, Mysore



Adding New Dimensions to Research & Development