Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 7 [6] May 2018 : 82-86
©2018 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

RESEARCH NOTE **OPEN ACCESS**

Recycling of Seri-farm residue into viable compost- Value addition to sericulture

P. Sudhakar[1*], S. K. Hanumantharayappa[2], Jalaja S Kumar[3] and V. Sivaprasad[4]
[123] Regional Sericultural Research Station, Central Silk Board (CSB), Kodathi, Bangalore - 560 035 (Karnataka).
[4] Central Sericultural Research and Training Institute, CSB, Srirampura, Mysore - 570 008 (Karnataka).

Received 10.01.2017 Revised 17.02.2018 Accepted 30.04.2018

Sericulture has been in practice since ancient times and has become a good source for economic upliftment of rural people in view of its fast income generating nature. In India, sericulture is a well developed cottage industry and the technologies developed recently have made it possible to practice sericulture intensively with concomitant higher profit than from the major agricultural crops. About 90% of the world silk production is from mulberry silk. Mulberry leaves serves as food for the mono phagous silkworm. Silkworm rearing is conducted by three methods viz., Tray rearing, shoot rearing & floor rearing. In tray rearing, individual mulberry leaves are plucked and fed to silkworm 3-4 times/day in a rearing trays and bed cleaning is done daily once. This method is labour intensive and time consuming. Last 10 years shoot rearing method is more accepted technology because of labour saving, less drudgery and for good cocoon yield. In this method, shoots are harvested, daily 2-3 feeds are given on the shoot rearing rack and bed cleaning is done only once at the end of rearing. In floor rearing also shoots are harvested, 2-3 feeds are given per day on the floor itself. Since the method requires more floor area. Hence this method is not popular in India. During silkworm rearing, lot of rearing residue is generated and this is not disposed properly. Due to its improper disposal leads to:

- ✓ Secondary contamination in turn increases the silkworm diseases, this leads to partial or complete crop loss. Because of crop loss the sericulturists put under economic loss
- ✓ Pollution, health hazard for human beings and domestic animals.

As per the information available, at present rearing residue is used for the following purpose

Burning & used as domestic fuel for cooking: Majority of the farmers (50%) are burning the rearing residue considering it as mere waste or using as fuel for cooking (Fig. 1).

Fig.1: Dumping rearing residue in vacant place & burning

Used as fodder for domestic animals: Around 20% of farmers are using rearing residue as fodder for domestic animals (Fig. 2). Time to time the residue were fed to the cattle and with same hands without washing involved in rearing operations harming their rearing.

Fig.2: Rearing residue used as fodder for domestic animals

Used as trenching and mulching material: Some progressive farmers (20%) uses rearing residue as raw material for trenching & mulching process to improve the soil nutrient and organic matter thereby improving the water absorption and moisture holding capacity (Fig. 3).

Fig. 3: Rearing residue used for trenching & mulching

Raw material for compost making: Few farmers (10%) resort to utilizing rearing residue for compost making. It clearly appears that, only few farmers are using the rearing residue as raw material for compost making and available technologies are not adopted or partially adopted. In view of this lot of resources are wasted and needs to be properly utilized for value addition from rearing residue and also avoid health hazard and environmental pollution. For generation of good quality compost from rearing residue following methods can be adopted

Windrow method (aerobic): This is done under tree shade. The rearing residue is piled up in heaps of convenient size (4 x 8'/4 x 10'/4 x 12'), watering the piled up residue, covering the heap with thin layer of soil & cow dung slurry for accelerating the decomposing by maintain 40-50% moisture in the heap. After 2-3 months compost can be harvested (Fig.4).

Fig.4: Windrow (aerobic) method of composting.

Pit method (anaerobic): In this method, 5-6 pits of 5 x 10' or 10 x 20' size are made manually or by using JCB and dumped all rearing residue in to the pits , war it, cover with soil & cow dung slurry. Leave as such for 2-3 months, after the period, compost will be ready for harvest (Fig. 5).

Fig.5: Pit (anaerobic) method of compositing

Vermicompositing: The vermicomposting technology is similar to pit compost method except using of brick wall plastered with cement pits. The pits are made of different dimensions (4'x3'x3'/4'x4'x3'/5'x4'x3') under a low cost shed to prevent the drenching of water it leads to killing of earthworms. In a pit 1kg earworms released to one MT partially decomposed raw material. Maintain 30% moisture in the pit for early decomposition. This technology is easy, effective, eco-friendly, economic and generation of nutrient rich compost within a short time of 60-90 days (Fig. 6).

Fig. 6: Recycling of rearing residue for vermicompost production

Trenching & mulching: This technology is another effective technology. In this technology, during the onset of monsoon either by manually or mechanically a furrow or trench with a depth of 8" to 1 ft is prepared in between mulberry rows near to the root zone . Seri-farm residue & any other soft leaf biomasses such as *Glyricedia* (nitrogen rich), *Acaulypha* (phosphorous rich), *Pongamia* and *Neem* leaves etc. are filled in the furrows and covered with soil & within one crop time (i.e. in 70days) due to continuous monsoon showers the trenched material will be decomposed . It will improve the soil health significantly by enhancing the organic carbon (OC %) content to a tune of > 1.0%.

Fig.7:Use of rearing residue for trenching & mulching

Rearing residue & its importance: From one acre mulberry garden, per year 40 MT of biomass is obtained (includes leaf & shoot). From this, 20 MT of rearing residue is generated & this rearing residue is properly processed, 8 MT of nutrient rich compost can be generated and this meets the demand of FYM

required for one acre of mulberry garden for one year. From this, sericulturist can easily saves Rs.16, 000/ (8 MT of FYM @ Rs.2000/MT) being the cost of FYM.

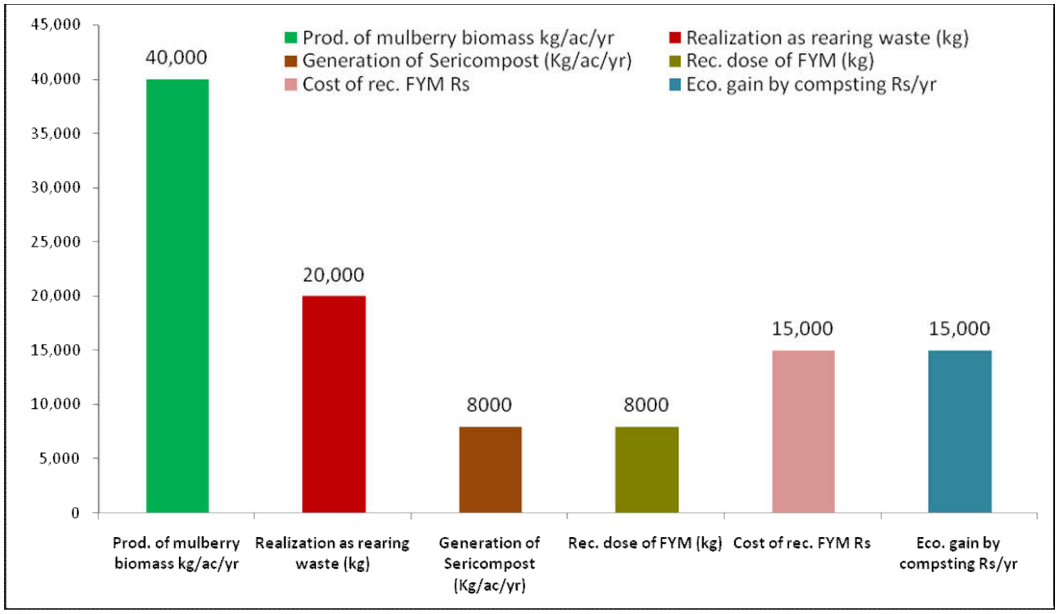

Fig. 3: Economic gain to a sericulturist due to imparting of seri-composting

Comparative nutritive status of FYM, Compost & Vermicompost compost generated from rearing residue is given below in the table:

Sl. No.	Nutrient status	FYM	Compost	Vermicompost
1	Nitrogen (N) (%)	0.3 – 0.5	1.6 – 2.24	1.88 – 2.14
2	Phosphorous (P) (%)	0.15 – 0.40	0.7 – 0.93	0.6 – 0.98
3	Potassium (K)(%)	0.3 – 0.5	0.3 – 1.5	1.0 – 1.7
4	Zinc (Zi) (ppm)	184.5	180 – 200	184.6-210
5	Calcium (Ca) (ppm)	42.8	200 – 265	61.5
6	Manganese (Mn) (ppm)	69.0	500 – 630	509.7
7	Ferrous (Fe) (ppm)	1465.0	1000 - 1330	1249.3

Perusal of the above data clearly indicates that nutrient status of Compost & Vermicompost prepared from serifarm residue is superior over FYM.

Thus, it is concluded that improper disposal of rearing residue leads to health hazard, environmental pollution & also cocoon crop loss. To avoid this, rearing residue can be recycled properly by adopting above described technologies for generating good quality nutrient rich compost and applying the same to mulberry field it will improve the fertility and health status of the soil. Further, it is economical and also eco-friendly.

CITATION OF THIS ARTICLE

P. Sudhakar, S. K. Hanumantharayappa, Jalaja S Kumar and V. Sivaprasad. Recycling of Seri-farm residue into viable compost- Value addition to sericulture. Bull. Env. Pharmacol. Life Sci., Vol 7 [6] May 2018 : 82-86