



# EFFECT OF VERMICOMPOST APPLICATION ON LEAF YIELD IN *TERMINALIA TOMENTOSA* W & A AND TASAR COCOON PRODUCTION

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## Abstract

Tasar sericulture, the production of tasar silk, is an agro-based enterprise. Its major production phase consists of two biological processes of growing/ maintaining Tasar food plants and carrying out rearing of Tasar silkworm, *Antheraea mylitta* D. Asan, *Terminalia tomentosa* W & A, is one of the primary food plants. The silk quality and quantity produced by Tasar silkworm depend upon nutritional value of their food plants. With introduction of new technologies in past few years' production and productivity levels in Tasar sericulture has gone up substantially. However, it is rare that fertilizers and manures are supplied to soil by the Tasar Sericulturists, as the Tasar silkworm rearing is done outdoor on natural forest plantation. This has led to exploitation of soils, thus affecting quality and quantity of produce. Present work was taken up to investigate the effect of soil application of vermicompost on leaf production and Tasar cocoon production.

Study was carried out at field Khapa of RTRS Bhandara, during 2011-12, on existing natural plantation of *T. tomentosa* for three crops viz., I, II and III. Freshly prepared vermicompost was supplied to Asan plants @ 2.0 kg/plant. Soil application of vermicompost resulted in 9.75, 9.09 and 8.06% improvement in leaf yield over control during I, II and III crop period, respectively. Rearing of Tasar silkworms on treated plants, that were supplied with vermicompost, resulted in 17.17, 12.34 and 5.18% increase in cocoon yield over control, during I, II and III crop period, respectively. Larval weight was also more in case of treatment as compared to control, an indication of better leaf quality in treated plants. Single cocoon weight and single shell weight increased in case of cocoons harvested from vermicompost treated plants. In case of treatment SR% increased by 2.155% over control. Based on results of present study and it is recommended that vermicompost may be supplied to Tasar food plants in order to obtain good quality leaves and better produce.

**Key words** : Tasar sericulture, vermicompost, Asan, leaf yield, Tasar silkworm, cocoon yield.

## Introduction

Tasar sericulture is a unique enterprise. Its major production phase consists of two biological processes of growing/ maintaining Tasar food plants and carrying out rearing of Tasar silkworm, *Antheraea mylitta* D. - an economically important sericogenous insect producing Tasar silk. Both of them happen to be on-farm activities. Asan, *Terminalia tomentosa* W & A, is one of the primary food plant. The silk quality and quantity produced by Tasar silkworm depend upon nutritional value of their food plants (Sahay and Kapila, 1993). The growth and development of Tasar silkworm larvae and economic characters of cocoons produced by them are greatly influenced by nutritional contents of leaves (Sinha *et al.*, 2002). Sahay *et al.* (2001) indicated that leaf quality is one of the important factors contributing to success of

Tasar crops. Subbaswamy *et al.* (2004) stated that quality of leaves depends on the balanced supply of essential nutrients from soil. Sahay and Kapila (1993) viewed that the productivity of host plant and quality of foliage depend upon a judicious management of inputs such as water, micro and macro nutrients.

During past few years' production and productivity levels in Tasar sericulture has gone up substantially, thanks to introduction of new technologies. However, this has led to exploitation of soil. As the Tasar food plants growing in forests are put to use by Tasar sericulturists, mainly the forest dependent communities, it is rare that fertilizers are supplied to soil (Singhvi *et al.*, 2012). This is established fact that such non-supplementation led to degradation of soils, thus affecting quality and quantity of produce. The rejuvenation of degraded soils by

**Table 1 :** Effect of soil application of vermicompost on leaf yield in *Terminalia tomentosa* during year 2011-12.

Parameter	Leaf yield/plant (kg)		% increase in leaf yield over control
	Control	Vermicompost soil application	
I crop	4.41	4.84	9.75
II crop	5.17	5.64	9.09
III crop	2.48	2.68	8.06

**Table 2 :** Effect of feeding DTV Tasar silkworm on plants supplied with vermicompost on cocoon yield during year 2011-12.

Parameter	Cocoon yield/DFL (No.)		% increase in cocoon yield over control
	Control	Vermicompost soil application	
I crop	35	29.87	
II crop	30.95	27.55	
III crop	90.75	86.28	

**Table 3 :** Effect of feeding DTV silkworms on Asan plants that were supplied with Vermicompost (soil application) on rearing performance and cocoon quality during yr 2011-12 (Average of three crops)

Parameter	Control	Vermicompost application
Matured larva weight (g)	28.01	29.91
Cocoon yield/dfi (No.)	47.9	52.23
Single cocoon weight (g)	9.44	9.83
Single shell weight (g)	0.925	0.983
Silk ratio (%)	9.798	10

protecting top soil and sustainability of productive soils, to obtain quantitative production of quality produce, thus, is a major concern among scientists. It is, therefore, present work was taken up to investigate the effect of soil application of vermicompost on leaf production and leaf quality in Asan, as measured by Tasar cocoon production.

### Materials and Methods

Present study was carried out at field Khapa of RTRS Bhandara on existing natural plantation of *T. tomentosa*. Freshly prepared vermicompost, produced at field Khapa of RTRS Bhandara, was supplied to Asan plants @ 2.0 kg/plant. At the time of application, it was ensured that soil has sufficient moisture. Study was conducted for one year during 2011-12 in three subsequent crops. Diseases free laying of Daba TV were reared on plants supplied with vermicompost during all the three crops, under natural conditions, following standard package of rearing (Singhvi *et al.*, 2010).

## Results and Discussion

### Effect on leaf yield

Soil application of vermicompost resulted in 9.75, 9.09 and 8.06% improvement in leaf yield over control during I, II and III crop period, respectively (table 1). It was noted that in treated plants leaves remain available for longer period, at the end of III crop, during January, as compared to control plants where leaves become yellow and leaf fall started. Also the leaves of the treated plants were dark green in colour as compared to control plants.

Rearing of Tasar silkworms on treated plants, that were supplied with vermicompost, resulted in 17.17, 12.34 and 5.18% increase in cocoon yield over control, during I, II and III crop period, respectively (table 2). Larval weight was also more in case of treatment as compared to control. Similarly, single cocoon weight and single shell weight increased in case of cocoons harvested from vermicompost treated plants. In case of treatment SR% increased by 2.155% over control.

Results vividly indicate the beneficial effect of vermicompost application on leaf quality and leaf yield, as reflected in better cocoon crop performance. Based on results of present study and it is recommended that vermicompost may be supplied to Tasar food plants in order to obtain good quality leaves and better produce.

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