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## Influence of improved muga culture technology on knowledge level of farmers

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**Abstract**

The present study was conducted during 2017-18 in Central Muga Eri Research and Training Institute Lahdoigarh, Jorhat district of Assam. The data was collected through structured interview schedule research design was used for the study with a sample of 150 from upper and lower Assam districts of Assam, India to assess the knowledge level of muga farmers on improved technologies. The study revealed that cent per cent of the farmers have of knowledge on selection of selection of seed cocoon followed by 99.30 per cent and 96.70 per cent of farmers have knowledge on pre brushing care and intercropping respectively. There is a significant relationship exist between age, Sericulture income, land holding and experience. The results showed that farmer's skill training program has a positive impact on knowledge on improved technologies of muga culture which results in increase the cocoon production and productivity.

**Keywords:** Cocoon, intercropping, productivity and sterilization

**Introduction**

Muga silkworm (*Antheraea assamensis*, Helfer) is a semi domesticated multivoltine insect reared on two primary host plants viz., Som (*Persea bombycina*) and Soalu (*Litsea monopetala*) and six crops can be reared in a year. Mainly two crops i.e., Jethua (during Apr-May) and Kotia (during Oct-Nov) are considered as commercial crops to produce golden yellow muga silk. Out of the remaining four crops, two crops i.e., Jarua (during Dec-Jan) and Aherua (during May-June) are considered as pre seed crops followed by two main seed crops i.e., Chatua (during Feb-Mar) and Bhadia (during Aug-Sep) respectively. Since time immemorial, the muga culture was being practiced by the rural folk in the Brahmaputra valley in Assam. With the congenial climate and plenty of nature grown food plants, the state alone contributes more than ninety percent of the total production of muga silk in the country.

Presently, more than 10000 ha area is covered under cultivation of muga host plantation and about 34,000 families are actively involved in muga culture in Assam. Production and productivity of muga culture mostly depends on the knowledge and adoption of the latest technologies (Singh *et al.*, 2014 and Goswami *et al.*, 2015) [14, 8]. In the recent past, various improved technologies of muga culture like cultivation and management of muga host plants, production of disease free laying (df), early and late stages silkworm rearing, prophylactic measures against pests and diseases, improved moutage for cocoon spinning, etc. were developed and recommended for the benefit of farmers (Chakravorty *et al.*, 2005) [2]. However, production of muga raw silk although increasing steadily, it is still behind the potential production of 200 MT and has been swinging from 105-158 MT during last 10 years (Choudhury, *et al.*, 2016) [3]. Barah *et al.* (2004) [1] reported that in muga culture, yield gap between demonstration centre and the farmers is 50% in seed and 30% in commercial crop. Therefore, present study was undertaken to assess the knowledge level of improved technologies of muga culture among the muga farmers. The study also focused on the relationship of personal and socioeconomic variables of the farmers with knowledge of muga culture technologies.

**Material and Methods**

The present study was conducted in 2017-18 in Central Muga Eri Research and Training institute, Lahdoigarh, Jorhat district of Assam. To assess the knowledge level of improved technology of muga culture of of trained muga farmers in the upper and lower Assam. In this view, a Survey was conducted in upper and lower Assam of muga producing districts namely, Sivsagar, Dibrugarh, Lakhimpur, Golaghat Goalpara and Kamrup respectively. a list of 25 trained farmers were selected from each selected districts, based on the based on the farmers skill training program undergone in training section of CMER&TI, Lahdoigarh from 2012-13

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and 2013-14. thus making sample size of 150. Primary data pertaining to level of knowledge on improved technologies of muga culture, socio personal characteristics such as age, education, experience, family size, operational land holding, sericulture income, etc were collected through personal interview method in a pre-tested questionnaires developed for the purpose. Knowledge level of muga farmers was studied using the knowledge test developed by Kunzru and Tripathi (1994) [9] based on the 'correct' and 'wrong' answer responded by the farmers with scoring of 'one' and 'zero' respectively. The mean was determined using the total score

and number of total questions. A total number of 16 recommended practices covered under integrated technology package of muga culture recommended by Central Muga Eri Research & Training Institute, Lahdoigarh, Jorhat were selected. In order to know the relationship between socio-economic characteristics and knowledge level of the farmers, collected data was statistically analyzed using correlation and regression coefficient.

## Results and Discussion

**Table 1:** Socio-economic characteristics of muga farmers (N=150)

Sl. N	Characters	Categories	No of farmers	Percentage
1	Age	Young (Up to 35 years)	31	20.67
		Middle (36-56 years)	111	74.0
		Old (above 56 years)	8	5.33
		Total	150	100
2	Sex	Male	135	90.0
		Female	15	10.0
		Total	150	100
3	Caste	SC	17	11.33
		ST	74	49.33
		OBC	44	29.33
		MOBC	9	6.0
		General	6	4.0
		Total	150	100
4	Marital status	Unmarried	18	12.0
		Married	132	88.0
5	Education	Illiterate	10	6.67
		Primary level	70	46.67
		Secondary	63	42.0
		Graduate and above	7	4.67
6	Family size	Small (Up to 3 members)	17	11.33
		Medium(4-5 members)	121	80.67
		Big (Above 5 members)	12	8.0
7	Land area under muga food plants	< One acre	78	52.0
		One acre	47	31.33
		> One acre	25	16.67
8	Primary occupation	Agriculture	104	69.33
		Muga culture	32	21.33
		Other	14	9.33
9	Seri income	Low (Rs. 30000 - 40000)	74	49.33
		Medium(Rs.40000-60000)	40	26.67
		High (Above Rs. 60000)	36	24.0
10	No of plants	<200	70	46.67
		200-400	50	33.33
		400-600	30	20.0
11	Rearing capacity	50-100	34	22.67
		100-200	103	68.67
		>300	13	8.67
12	Experience	0-5 years	46	30.67
		5-10 years	26	17.33
		>10years	78	52.0

It was evident from the Table 1 that majority (74.00%) of the farmers belonged to middle age group followed by young (20.67%) and old (5.33%) age group. Majority (90.00%) of the respondents were belonged to male category. Education level of majority of the farmers (46.67%) was up to primary level followed by secondary level (42.00%). Family size of most of the farmers (80.67%) consists of 4-5 members and majority of the farmers (69.33%) considered agriculture as primary occupation. Majority (52.00%) of the respondents had less than 1.0 acre of land holding under muga host plantation. As regards to the sericulture income, 49.33 per cent of the farmers had low level of income ranged from Rs.

30000.00 to 40000.00. Experience in muga culture was exhibited by majority (52.00%) of the farmers as >10 years. People of the middle age group have more work efficiency and they have gathered more experience on muga culture over the years. This may be the probable reasons for majority of the muga farmers belongs to the middle age group. Goswami *et al.*, (2015) [8] also reported that most of the muga rearers are above 35 years and the new generation are seems not to be interested to involve in the practice. Muga silkworm is reared in outdoor condition and the farmers need to have lot of skills to conduct muga silkworm rearing effectively. Male persons are highly skilled and well experienced on muga culture

hence, their involvement was also high. It is fact that education of individual determines their knowledge level and mental status and plays a key role in moulding and bringing desirable changes. Probably, the poor economic condition of the muga farmer and other social constraints made them to educate less, but as the trends are changing in the society, education level of some of the farmers are also gone up to graduate level. Mech *et al.*, (2004)<sup>[12]</sup>, Borah *et al.*, (2004)<sup>[12]</sup> and Goswami *et al.*, (2015)<sup>[8]</sup> also reported the same level of education among the muga farmers. Many of the time, the farmers are failed to harvest good crops due various climatic condition and incidence of pest and disease of silkworm. In addition to that, sometimes farmers are taking only one or two crops in a year. Probably, due to these facts, the farmers considered the muga culture as secondary source of income considering the agriculture as primary.

### Overall Knowledge level of respondents on improved technologies of muga culture:

It can be seen that in Table 2 that majority of the farmers (77.34%) belonged to high knowledge category followed by 22.67 per cent of them belonged to medium knowledge category.

**Table 2:** Overall knowledge levels of respondents on improved technologies of muga culture

Sl. No	Category	Knowledge levels	
		No of farmers	Percentage
1	Low	0	0.0
2	Medium	34	22.67
3	High	116	77.34
	N	150	100

**Table 3:** Knowledge level of farmers on improved technologies of muga culture

Sl. No	Name of technologies	No. of farmers	%
1	Spacing of host plants	139	92.67
2	Application FYM and NPK	95	63.33
3	Intercropping	145	96.70
4	Pruning schedule	118	78.67
5	Control of stem borer	88	58.67
6	Mother moth examination	38	25.30
7	Egg surface sterilization	46	30.70
8	use of dfls	140	93.33
9	Pre brushing care	149	99.30
10	Early stage rearing	131	87.30
11	Lahdoi	93	62.00
12	Biological control of uzi fly	66	44.00
13	Improved mountage	101	67.33
14	Selection of seed cocoon	150	100.00
15	Disinfection of rearing field	88	58.70
16	Disinfection of rearing appliance	110	73.33

The results in the Table 3 indicated than, cent per cent of the trained farmers have of knowledge on selection of selection of seed cocoon followed by 99.30 per cent and 96.70 per cent of farmers have knowledge on pre brushing care and intercropping respectively. Whereas 25.30 per cent of the farmers have knowledge on mother moth examination and 30.70 of them per cent of them have knowledge on egg surface sterilization Mother moth examination requires Microscope and use of chemicals to identify the pebrine disease it may be the reason for not having much knowledge after the training program.

**Table 4:** Association between socio-economic characteristics of trained farmers and their knowledge level of technologies

Sl No	Variable	Independent Variables	Corr.Coeff (r)
1	X <sub>1</sub>	Age	0.513**
2	X <sub>2</sub>	Education	0.112
3	X <sub>3</sub>	Family size	-0.085
4	X <sub>4</sub>	Seri income	0.247*
5	X <sub>5</sub>	Land holding	0.349*
6	X <sub>6</sub>	Experience	0.635**

\*\*\* Significant at the 0.01 level, \*\* Significant at the 0.05 level

It could be observed from the Table 4 that four variables such as age, land holding, experience and sericulture income showed significant relationship with knowledge level among the farmers. It indicated that higher the age higher the knowledge due to increase of experience and exposure to various improved technologies of muga culture. The results of the study are in consistency with Srinivasa *et al.*, (1996)<sup>[15]</sup>, Lakshmanan and Geethadevi (2007)<sup>[10]</sup> and Vijayakumari and Rajan (2006)<sup>[18]</sup> reported in mulberry sericulture. The Table also indicated that education had a positive relationship although it is not significant. The muga farmers with higher level of education are more exposed to different sources of information and therefore their knowledge about the improved technologies of muga culture is high. Their involvement as muga farmers' facilitated clear understanding of the problems associated with muga farming and therefore, enhanced their practical knowledge. Similarly, seri income had a positive relationship with the knowledge of farmers. Meenal and Rajan (2007)<sup>[13]</sup> reported that association between land holding, mulberry area and income obtained with knowledge was just because of the linear and positive link among them. This was proved in many studies conducted earlier for sericulture technologies (Dolli *et al.*, 1993; Geetha *et al.*, 2001; Vijaya Prakash and Dandin, 2005; Meenal and Rajan, 2007)<sup>[5, 7, 17, 13]</sup>. On the other hand, it could be observed from the Table that family size is negatively associated with the knowledge level.

**Table 5:** Multivariable relationship between socio-economic characteristics of trained farmers and their knowledge level about improved technologies of muga culture

Variable	Independent Variables	Regression Co-efficient		
		Reg. Coeff (b)	Std. Error	t-Value
	Intercept	28.85	6.051	16.594
X <sub>1</sub>	Age	0.87	0.371	6.378**
X <sub>2</sub>	Education	0.18	0.493	2.887*
X <sub>3</sub>	Family size	-0.32	0.567	-0.347
X <sub>4</sub>	Seri income	-0.008	0.0003	-0.941
X <sub>5</sub>	Land holding	0.21	0.746	0.576
X <sub>6</sub>	Experience	0.603	0.233	8.307*
	R <sup>2</sup>	0.62		
	F-ratio	1.46**		

Data presented in the Table 5, it could be observed that the regression co-efficient of the personal and socio-economic variables of the respondents namely age (X<sub>1</sub>) is found to be highly significant at 1 per cent level among muga farmers towards knowledge level about improved technologies. While the variables education (X<sub>2</sub>) and experience (X<sub>6</sub>) was found to be significant at 5 per cent level. Further, the variables like family size (X<sub>3</sub>) and sericulture income (X<sub>4</sub>) were found negative relationship while the variables land holding (X<sub>5</sub>)

were found positive relationship with the knowledge level about improved technologies.

The value of co-efficient of multiple determinations (R<sup>2</sup>) was 0.62 with significant F-ratio value at 1% level of significance (1.46). It clearly indicates the 62 per cent variation in the adoption level of the respondents was explained by all the independent variables put together.

### Conclusion

The study revealed the farmers undergone farmers skill training program under CMER&TI, lahdoigarh has a positive impact on knowledge level of muga culture farmers, the knowledge level of the respondents was significantly high. Knowledge level is one of the important aspects to the farmers for enhancing their socioeconomic status. In these study the characters like age, experience, seri income and land holding have a significant association with the farmers knowledge level. Farmers have a less knowledge on technologies which are involved in use of chemicals and some special skills to adopt the technologies. Therefore, these factors may be taken into consideration for creating more awareness about the improved technologies among the traditional muga farmers to produce the muga raw silk in to a desired level. Hence there is need to provide more number improved technology training program to the muga farmers for the enhancing there knowledge level.

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