

A NEW BRUSHING NET FOR BRUSHING OF SILKWORM LOOSE EGGS

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The newly evolved Bivoltine hybrids are available in the form of loose eggs which is having several advantages over the sheet eggs. The loose eggs are packed in small boxes. In such boxes all the eggs are not exposed properly to the required temperature, humidity and light unlike sheet eggs. Therefore, to facilitate the optimum climate conditions the eggs should be transferred to the loose egg plastic incubation frame. Brushing of loose eggs with two nylon mosquito net is to avoid the mixing of un hatched eggs with the rearing bed. The body of newly hatched larvae covered with hairy bristle like structure which do not allow the larvae to crawl freely by crossing two layers of nets and it leads to missing larval percentage, which was as high as 17%. Due to the reuse of the net the size of the net shrinks and loses its shape and elasticity. To overcome these problems the use of an alternate and improved brushing net was recommended. This method requires only one HDPE Poly fabric (30% shade net) preferably white in colour to use for brushing of newly hatched larvae. No sticking of egg shells was noticed. Re use of shade net don't alter the shape, size as there is no shrinkage, compared to control of using two mosquito nets for brushing. The economics cocoon yield by reducing the missing larvae is 5.3 kg per 100 dfls. The minimum larval percentage was reduced from 12% to 5.25% by use of new brushing net. There is a gain of 5.3 kg by cocoon weight / 100 dfls (50,000 larvae). The use of new brushing net (30% shade net) saves labour, cost on net, reduces missing larval percentage and improves cocoon yield.

Key words : Loose eggs, incubation frame, brushing net and hatched larvae.

INTRODUCTION

The silkworm having been reared under domesticated conditions since thousands of years, it has become very sensitive and delicate to the fluctuating environmental conditions. Reproductive seed is prepared in the sheet form (to retain/trace the identity), while the industrial hybrids are prepared both in the sheet form or loose form. By virtue of the advantages associated with loose egg production, in countries like China and Japan, commercial hybrids are invariably produced in loose form (Biram Saheb *et al.*, 1995). The loose eggs are packed in small boxes. In such boxes all the eggs are not exposed properly to the required temperature, humidity and light. Therefore, to facilitate the optimum climatic conditions the eggs should be transferred to the loose egg plastic incubation frame.

The first day of the rearing is the most crucial period to decide the fate of total rearing. Since, newly hatched larvae needs most succulent mulberry leaves. Selected tender leaf must be provided on the first day of rearing. The transferring of the larvae from incubation frame to the rearing tray is called the brushing of the larvae. Brushing is an important activity in the rearing. The brushing of loose egg needs more skill compared to sheet eggs. Wrong method of loose eggs brushing leads to minimize the missing larvae. To minimize the occurrence of missing larvae a new brushing net was proposed. The present communication explains the details of the new brushing net use for silkworm

loose egg brushing.

MATERIALS AND METHODS

It was recommended to apply two layers of mosquito nylon nets having mesh size 3 mm over the newly hatched larvae on the incubation frame and sprinkle the chopped tender leaf over the brushing net and cover with paraffin paper or polythene sheet (Rajan *et al.*, 2000). Allow the larvae to crawl over the net for 4 to 6 hours to eat the leaf. When all the larvae crawl over the net, gently lift the top net along with larvae and leaf and reverse the net and stretch it gently so that all the larvae and leaf fall to the rearing tray. Make the rearing bed and cover with paraffin paper or polythene sheet and put the tray back in rearing stand.

The plastic incubation frame consists of two plastic frames. Outer one is plastic checkered incubation plate (29 cm x 24 cm) and inner one is fixing (24 cm x 19 cm) frame Himanthraj *et al.*, 2001). During brushing the inner frame of plastic incubation frame taken out. Remove tissue paper gently and place by the side of incubation frame in rearing tray. The newly hatched larvae attached to the tissue paper fed directly with chopped tender mulberry leaf. However, just to separate out the newly hatched larvae from the egg shells.

A new brushing net with 30 % shade net of poly fabric was used. White colour net is preferable than the other colours because, small newly hatched larvae is easily visible with white colour net. Only one net is enough to put on newly hatched larvae. The chopped tender mulberry leaves sprinkle over the net and allows the larvae to crawl over it. The elasticity of the brushing net is very high and it is very easy to set on the frame easily. The mesh size of the new brushing net is 5 mm x 5 mm.

RESULTS AND DISCUSSION

To accommodate 5000 dfls a total of 100 incubation frames are required @ 50 dfls/ frame. It was calculated that in one square meter a total 8 brushing nets of the size of incubation frame can be cut. Time taken for crawling newly hatched larvae on the net is 2.5 hrs. The savings by adopting the 30% Poly fabric brushing net is Rs. 240.00 (Table I). Savings in recurring expenditure in the form of man days is Rs. 80.00 by adopting 30% Poly fabric net. The total savings per year will be about Rs. 2800.00 in the form of man days and cost of net (Table: II). Poly fabric 30 % only one net is required. Missing percentage ranges between 0.5 to 5.5% .To brush the 5000 dfls larvae it took 2 hour/4 persons.

Table I : Economics and requirement of the brushing net for 5000 DFLs.

S. No.	Method of brushing	Requirement of the net (m)	Rate of the net/ m	Total amount (Rs.)
1.	Old method of brushing by using two layers of mosquito net	24	20	480.00
2.	New method of brushing by using single 30 % shade net	12	20	240.00
SAVINGS				240.00

In the old method of brushing two mosquito nets are required per frame and 4 to 6 hours are required to allow the larvae to crawl. To brush 5000 dfls larvae it takes 4 hours /4 persons. Missing percentage of larvae per 100 dfls ranges between 7 to 17% (Table: III). The average missing larval percentage was 12 (Table III).

In the old method of brushing, while lifting the top brushing net the lower net should be leave as such. The purpose of keeping two mosquito net was to avoid the mixing of un hatched eggs with the rearing bed.(Rajan *et al.*, 1998; Kawakami, 2001; Himanthraj *et al.*, 2001). The lower net will take care of separating out the egg shell from the rearing bed (Biram Saheb *et al.*, 1995). The mesh size of the old brushing net is 3 mm diameter (Himanthraj *et al.*, 2001).

Old method of using double net for brushing have several disadvantages such as two sets of brushing nets are required to complete the brushing operation. It takes more time to put two layers of nets on newly hatched larvae. The body of newly hatched larvae covered with hairy bristle like structure which doesn't allow the larvae to crawl easily by crossing two layers of nets and it leads to larval missing percentage, which was as higher as 17%. The mesh size of mosquito net are small (3 mm) and when two nets placed over each other once again the holes were covered by crossing each other. All this makes the newly hatched larvae difficult to crawl easily over nets and a considerable amount of newly hatched larvae remains in the incubation frame itself and leads to missing larvae. Due to the reuse of the net the size of the net shrinks and lost its shape and elasticity. Comparatively difficult to store it properly it looses the shape and lot of wrinkles are observed due to repeated use, less durable 20 to 25 crops.

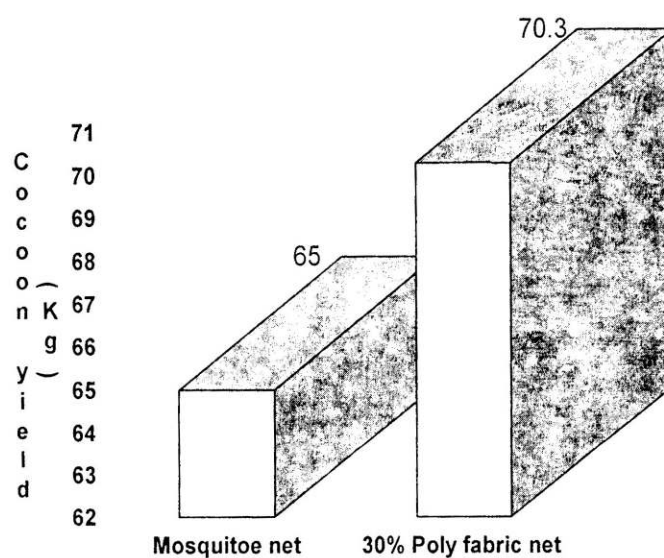
Brushing with new 30 % poly fabric the mesh size is big enough for the newly hatched larvae to crawl easily through net to eat leaf. Hence, missing percentage reduced to 0.5 to 5.5%. Since fabric used in 30% poly fabric net, it will not injure to larvae. Easier to store and does not loose the shape and no wrinkles observed even after repeated

Table II : Comparative requirement of Man days for brushing of 5000 DFLs per batch & per annum (New & Old Net method).

S. No.	Method of brushing	Requirement (Man day)	Rate / MD. (Rs)	Total amount (Rs) / Batch	Total amount per annum (32 crops) (Rs)
1	Old method of brushing by using two sets of mosquito net	2	80	160	5120.00
2	New method of brushing by using single 30 % shade net	1	80	80	2560.00
A. Total Savings for 32 crops /yr				80.00	2560.00
B. Cost of net					240.00
TOTAL SAVINGS					2800.00

Table III : Gain in larval number by reducing the missing larvae

S. No	Method of brushing	No. of eggs taken for brushing	Average hatching (90 %)	Average larval missing % during brushing	Larvae supplied to farmers (Missing @ 5%)
1	Old method of brushing by using two layers of mosquito net	50,000	45,000	12.00	39600
2	New method of brushing by using single 35 % shade net	50,000	45,000	5.25	42638
Gain in larval number					3038

**Fig. :** Cocoon yield in (Kgs)

use also. More durable can be used more than 32 times. It takes 35 % less time to spread the net over larvae. Easy to maintain and store and saves money. Time taken for brushing is reduced and also labour saved. Gain in cocoon yield by 5.30 kg per 100 dfls by reducing the missing larvae (Fig. 1).

By observing all the above merits it is advisable to all the Chawki Rearing Centres to use the 30% Poly fabric net for brushing silkworm loose eggs to save labour, cost on net, reduces missing larval percentage and improves cocoon yield, also economical but more hygienic and user friendly also.

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