Environment & Ecology 26 (3) : 1020—1022, 2008
 ISSN 0970-0420

Effect of Different Pruning Times on *Aghani* Lac Yield from Ber (*Ziziphus mauritiana*)

S. GHOSAL

Indian Institute of Natural Resins & Gums, Namkum
Ranchi 834010, India

Abstract

Studies on different pruning times of ber (*Z. mauritiana*) for *aghani* (winter season) lac cultivation revealed that May pruning was not suitable at Purulia. West Bengal. Ber trees were pruned in February and May and inoculated with *kusmi* lac in July, 2005 for raising *aghani* lac. Lac yield from February and May pruned trees was compared against that of farmers' method which included pruning operation at February but no crop protection measure was adopted. Predator population in the lac crop was found to be the lowest in lowest in February pruned trees (5.11 times lesser than farmers' method). May pruned trees showed the lowest yield ratio which was 2.17 times lesser than the farmers' method.
Key words : *Ziziphus mauritiana*, Ber, Pruning time, *Aghani*, Lac cultivation.

Ber (*Ziziphus mauritiana*) is a popular lac host among the lac growers. It is suitable for lateritic soils and drier regions (1). Even though this host is suitable for cultivation of both *rangeeni* and *kusmi* strains of *Kerria lacca,* but growers generally exploit it for *baisakhi* crop of *rageeni* strain. This crop is raised in October—November and harvested in April —May, before crop attains maturity (popularly known as *ari* harvesting). Crop harvesting, also serves as host pruning ensures availability of fresh shoots of suitable age for raising the subsequent *baisakhi* (summer season crop). It has been shown that use of ber for *kusmi* lac crop is more remunerative than *rangeeni.* Yield of *kusmi* lac during *aghani* season on ber is more than *rangeeni* lac (2). Besides, *aghani* crop on ber also produces broodlac which can be used for maintaining continuity of lac crop in alternation with other host plants. For raising *aghani* and *baisakhi* lac crop, pruning is recommended in February—March and April—May respectively, in Ranchi, (Jharkhand) conditions (3). So, farmers interested in switching over to *aghani* lac cultivation after harvesting *baisakhi* crop in May, may not be able to get shoots of proper age in July. A farmer willing to shift from traditional *ari* lac cultivation to *aghani* lac needs to inoculate either on 3 months shoots in July or, has to wait one more year. The study aims in determining the yield loss due to lac cultivation on May -pruned trees instead of February pruned ones in consecutive two seasons. Average minimum temperature and rainfall of Purulia (17.7 C and 1, 387 mm) were little higher than Ranchi (17.0 and 1,327 mm.) and range of temperature fluctuation is a little wider in Purulia (max temperature range is 21—42 C compared to 24—39 C at Ranchi). Therefore, a study was taken up on ber in Cossindih village of Purulia (West Bengal) to examine the productivity of *aghani* lac crop from trees harvested in May.

(Author is thankful to the Director for his inspiration and Head, Lac Production Division for his guidance in preparation of manuscript. K. A. Nagruar is duly acknowledged for recording data in farmers' field condition. Support of K. V. K., R. K. Mission, Purulia is acknowledged for supplying in-puts for the experimentations under their on-farm demonstration scheme).

Methods

Two sets each of eight and four ber trees were pruned in February and one set of six ber trees was pruned in May. All the sets were inoculated in August 2005 at 20 g broodlac per meter shoot length. One spray of endosulfan at 0.05% along with carbendazim 0.01% was applied, 30 days after inoculation in all the inoculated trees based on recommended package of practice except the set of four trees which served as check, adopting farmers' method. To maintain uniformity, trees in farmers' condition were also inoculated at the same brood rate.

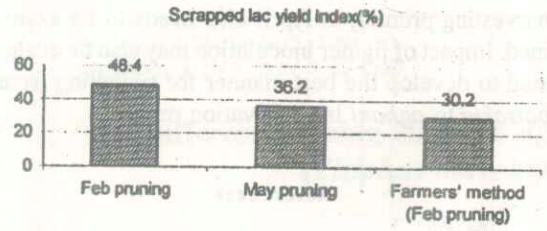

Figure 1. Scrapped lac yield index as affected by different treatments.

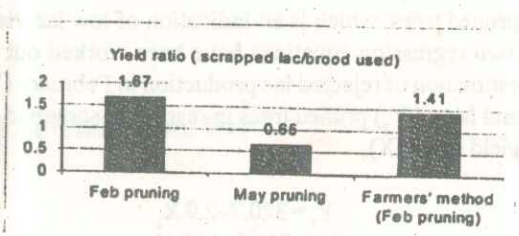

Figure 2. Yield ratio as affected by different treatments.

The experiment was conducted in a completely randomized design and critical difference was calculated at $P = 0.05$. The crop was harvested in February, 2006 and per tree yield data were recorded. The level of lac insect predators in the crop was estimateed by the number of holes on the lac sticks, formed by the emerging adult moths of two major lepidopterous lac predators, *Eublemma amabilis* and *Pseudohypotopa pulverea*. Inferior quality brood were sorted out to designate as rejected lac and scrapped lac turn over per unit brood lac produced has been termed as scrapped lac yield index. For ease in comparison, yield ratio i. e. scrapped lac yield per unit brood used was worked out.

Results and Discussion

The scrapped lac yield index (on fresh weight basis) was high (~2$^{1}/_{2}$ times) from trees pruned in February compared to those pruned in May (Fig. 1) . The yield ratio with farmers' method was also about 2 times higher than that from May-pruned trees (Fig.2). Average values for the same were recorded to be 1.67, 0.65 and 1.41 respectively. Mean predator holes from

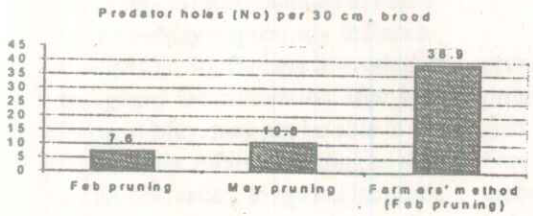

Figure 3. Predator holes (no.) per 30 cm as affected by different treatments.

May pruned trees were 10.8 per 30 cm long brood, while only 7.6 were found in February pruned trees (Fig.3). The estimated lepidopterous predator population in the crop raised on May-pruned trees was significantly higher compared to that on February pruned trees. Besides, the proportion of lac encrustations not suitable for broodlac purposes (rejected lac) was also higher in May-pruned trees compared to those pruned in February. The lepidopterous predator infestation level was high (~5 times) under farmers' method compared to other two treatments, in which pest control measure was undertaken. However, yield reduction was not proportionate to pest infestation level, as yield ratio was similar in February pruned trees and farmers' method. Yield ratio declined drastically in May-pruned trees (0.65) despite spraying. The yield reduction is much lower in the light of differences in predator populations among the treatments. Earlier studies have shown that higher predator population may not lead to proportionate scrapped lac yield reduction due to manifestation of the predators during the later phase of the lac crop. But the brood value of the crop is adversely affected due low proportion of living gravid females, which produce the larvae for raising the next crop, necessitating application of pest management measures for the crop. At maturity, the percentage of living female cells was only 14% of the existing population in farmers' method as compared to 40 and 38% in February and May pruned trees which were sprayed with insecticides.

Scrapped lac yield index and rejected lac stick production rate were inversely correlated to each other with correlation coefficients (r)–0.19 and –0.62 in February and May pruning, respectively. It indicates that rate of rejected lac stick production is more in May

pruned trees, which is an indication of low lac yield. Two regression equations have been worked out for estimation of rejected lac production in February (Y_1) and May (Y_2) pruned trees in respect to scrapped lac yield index (X).

$$Y_1 = 320.7 - 2.9 X_1$$
$$Y_2 = 768.9 - 14.7 X_2$$

These indicate that pruning in May leads to low output compared to pruning in February. Thus the intervening period of three months, between pruning and crop inoculation is insufficient for satisfactory growth of shoots in ber. The farmers should therefore be aware of the low yield ratio if they utilize the ber trees harvested/pruned in May for raising *aghani* crop in July. In the light of above findings, effect of harvesting/pruning in April also needs to be examined. Impact of lighter inoculation may also be evaluated to develop the best manner for switching from *baisakhi* to *aghani* lac cultivation on ber.

References

1. Roonwal M. L. 1962. Lac hosts. Pages 14—58 *in* B. Mukhopadhyay and M. S. Muthana, editors. Monograph on lac. Indian Lac Res. Inst., Ranchi, India.
2. Mishra Y. D., S. N. Sushil, S. Kumar and A. Bhattacharya. 2000. Variability of lac productivity and related attributes of *Kerria* spp. (Homoptera : Tachardiidae) on ber (*Ziziphus mauritiana*). J. Ent. Res. 24 : 19—26.
3. Kumar P. 2002. Host plant management for lac cultivation. Pages 86-91 *in* K. K. Kumar, R. Ramani and K. K. Sharma, editors. Recent advances in lac culture. Indian Lac Res. Inst., Ranchi, India.