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Effect of Different Pruning Times of *Ber* (*Zizyphus mauritiana*) in Relation to *Aghani* Lac Yield

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Abstract

Pruning is an important operation for lac cultivation. *Aghani* lac cultivation (winter season) on ber is a profitable enterprise, for which usual pruning time is February/March. Present paper explains consequences of lac cultivation under three different pruning times i. e. normal pruning in February, delayed pruning in April and unpruned conditions. Investigation suggested that pruning can be performed even up to mid-April without hampering lac yield. Length of encrustation per shoot in April pruning was found to be significantly higher than other two treatments. As a result, brood yield/brood used ratio was found maximum in April pruning, though difference was non-significant. Ratio were 6.87, 5.65 and 5.62 in April pruning, February pruning and under unpruned conditions (14 months old shoots).
Key words : *Kerria lacca*, Lac cultivation, Pruning times, *Z. mauritiana*.

Lac,a resin of animal origin is secreted by the insect *Kerria lacca* (Kerr). Among three major hosts, ber (*Zizyphus mauritiana*) is popular and supports both the strains of the insect. Mostly, the host is used for cultivation of *baisakhi* (summer season) crop of *rangeeni* lac,which fails to produce brood lac (propagating material of lac). Whereas, growing *kusmi* lac on ber as *aghani* (winter season) crop can produce brood lac for the next season, which provides higher returns to the growers as compared to *baisakhi* crop.

Besides, yield of *kusmi* lac on ber during *aghani* season is more than *rangeeni* lac (1). Therefore, utilization of the host is more than 50% in the major lac growing state like Jharkhand (2). In subtropical regions, the most appropriate pruning time of ber , which suits to its physiology is during summer when the trees shed their leaves and enter dormancy (3—6) and before initiation of new growth. However, for cultivation of *aghani* lac crop, pruning of the hosts is usually done in February March (7). But due to various activities in the farmstead, it is not always possible for the farmers to prune trees in time. Literature validated that pruning in May affected *aghani* lac yield adversely (8). However, no literature is available regarding suitability of April pruning for *aghani* lac cultivation. Therefore, it is important to assess, whether delayed pruning up to April, which is also a common practice for *ari* lac (immature) cultivation can give rise to suitable shoots to enable inoculation of lac in June-July. An experiment was therefore, conducted at Gosaindih village, Purulia during 2006—07 to examine the feasibility of delayed pruning up to April. The information generated from the experiment will help farmers who want to shift from *rangeeni* (*ari*) to *kusmi* (*aghani*) lac cultivation.

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Methods

For the experiments three sets of trees were taken. The first set with nine ber trees were pruned in February. Out of other two sets each with seven trees—first was pruned in April and the other remained unpruned (i. e. 14 months old shoots). All the three sets of ber trees were inoculated with *kusmi* lac insect in July (*aghani* crop) at 20 g brood/m shoot length and harvested in January 2007.

Recommended crop protection measures were adopted i. e. application of 0.05% endosulfan and 0.01% carbendazim at 30 DAI (days after inoculation)

Table 1. Predator population, lac thickness and lac yield per unit length recorded at different time intervals with different pruning times. *DAI : Days after inoculation.

Pruning time	Predator population (No. per meter brood)				Thickness of encrustation (cm)				Sticklac yield per metre lac stick (g)			
	100 DAI	120 DAI	150 DAI	At harvest	100 DAI	120 DAI	150 DAI	At harvest	100 DAI	120 DAI	150 DAI	At harvest
Feb	1.0	5.8	5.4	7.9	0.4	0.46	0.57	0.63	101	193	194	205
Apr	25.5	5.8	5.5	12.4	0.44	0.55	0.67	0.64	88	210	196	227
Un-pruned	10.6	3.2	6.9	11.2	0.43	0.47	0.61	0.67	82	166	236	195
SE±				2.2				0.32				18.5
$CD_{(0.05)}$				NS				NS				NS

and 0.03% DDVP along with 0.01% carbendazim at 60 DAI. Data collected were calculated in completely randomized design.

Soils of Purulia district in West Bengal is red lateritic. Average nutrient content of 0—90 cm depth of the soil is 0.063% organic carbon, pH 5.54, 106.9 kg N, 12.5 kg P_2O_5 and 295.8 kg K_2O per hectare. Lac samples were collected periodically for analysis of different yield attributes and predator population count. Sampling was done at 100, 120 and 150 days after inoculation for estimation of predator population to get the trend of result. Each time lac stick samples of 30—45 cm length were collected randomly from two trees of each treatment for counting average predator population, thickness of encrustation and sticklac weight. Values were finally converted into per meter. However, observations on these parameters were recorded for the samples or trees at the time of harvesting and were subjected to statistical analysis for proper inference.

Results and Discussion

Predator population per meter brood, thickness of lac encrustation and lac yield per meter (Table 1) were not influenced by the treatments, though numerical values for sticklac yield per unit shoot length was observed to be the highest in April pruned trees.

Different yield ratio and length of encrustation per shoot are presented in Table 2. All the yield ratio were in favor of April pruning, though the difference did not touch the level of significance. Significantly higher values of length of encrustation per shoot in April pruning might have favored higher yield ratio. All the treatments varied markedly among each other in holding length of lac encrustation per shoots. April pruning gave the maximum length of encrustation (46.8 cm) per shoot, with 8.7 and 26.5% lesser values in February and un-pruned trees.

April pruning gave rise to tender shoots which helped good settlement and subsequent good growth of lac insect as compared to shoots generated in other two times of pruning. The finding suggested that the lac growers who are unable to prune ber trees in february for *aghani* lac cultivation may go for pruning even up to April without any significant reduction in lac yield. With the increase in age of shoots, length of encrustation decreased significantly. Thus, least value of the trait was recorded in unpruned condition. Demand of assimilate is much in young and developing shoots. As a result, plants allocate much assimilate for young shoots and lac insects are benefited.

Table 2. Yield ratio of *aghani* lac crop on ber as influenced by pruning times.

Pruning time	Brood produced/ brood used ratio	Stick-lac/ brood used ratio	Rejected/ good brood (%)	Length of encrustation per shoot (cm)
Feb	5.62	2.85	23.33	42.7
Apr	6.87	4.00	28.28	46.8
Un-pruned	5.65	3.44	17.71	34.4
SE ±	1.18	0.73	5.96	1.87
$CD_{(0.05)}$	Ns	NS	NS	3.06

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