

Study on different lopping methods of *Litsea monopetala* in the midhills of Nepal

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Three lopping regimes were employed to see their effect on fodder production in Kutmiro (*Litsea monopetala*) for a period of 5 years. A significant difference in fodder production between years ($P=0.001$) and between the treatment ($P=0.023$) were found. Among the three treatments, pollarded at 1.5 m above the ground level with lopping at pollarded height every year, and pollarded at 1.5 m above the ground in the first year but followed by traditional lopping practice produce a mean fresh weight of 16 kg whereas the traditional farmers' lopping practice produce only a mean fresh weight of 11 kg. This shows that the pollarding of Kutmiro produced much fodder than the traditional lopping method. However, such study needs a long period of time to get more precise result.

Keywords: *Litsea monopetala*, fodder, lopping, agroforestry, midhills, Nepal

Litsea monopetala (Kutmiro) is one of the most important evergreen fodder trees. In Nepal it grows from about 100 m to 1600 m. Due to its fast growth, high foliage production, relatively light competitiveness with agricultural crop and to a lesser extent for its good nutritional value, it is one of the most used fodder trees in many mid-hill districts such as Dhading, Lamjung, Kaski, Dolkha and Lalitpur. Farmers protect the trees for fodder that are naturally growing or are planted on the edge of upland (*bariland*).

Shrestha and Pakhrin (1988) have reported that buffaloes feeding on an average of 8.5 kg/day of its fodder, in addition to their normal diet, increase milk production by an average of 0.25 litre/day. Its leaves contain 14.9-18% crude protein and 5.6-7.9 % ash (Shrestha and Tiwari, 1991) and digestibility is 12%. But its energy content is high with moderate tannin which reaches a peak in February and March (Jackson, 1994 and Wood *et al.* 1992). The nitrogen and calcium contents are 1.62% and 2.12% respectively (Singh, 1982).

The tree is commonly lopped once a year between November and March. The huge form of this tree makes it difficult to lop particularly to women who are the main collector. Trees are commonly lopped without leaving any branches.

So far, no study on lopping practices in any indigenous fodder species has been conducted in the country. However, the experience of the cattle attendants of Lumle Agriculture Research Centre have shown that the pollarded tree, in comparison to the traditional practice, was much easier for lopping with not much difference in its fodder production.

The excellent pollarding property of this species can, therefore, be a benefit to farmers in managing it in their upland with less effect on crop production due to its small size after pollarding. In addition, it can be compatible with the hill agroforestry practice.

The present paper attempts to bring out some useful information that can help for future study on various lopping regimes of some common fodder tree species in Nepal.

Methods

Eighteen trees of the same age and similar diameter at breast height were selected from the already established Kutmiro demonstration plot during 1993 at Dhab in Yampaphant (475 m asl), the former Off Station Research (OSR) site, Bandipur Village Development Committee (VDC) of Tanahun District. Three separate treatments - pollarded at 1.5 m above the ground level (T1) with lopping at pollarded height every year; pollarded at 1.5 m in the first year but followed by traditional lopping practice (T2) and traditional lopping practice (T3) were employed. There were six trees in each treatment.

Fodder biomass from each treatment was recorded annually. The first year fodder production was not considered as an observation since it was the year of implementation of different lopping regimes adopted for three separate treatments. A general regression analysis was carried out with the available data in Genstat (statistical programme) to analyse the effect of different lopping regimes on fodder production.

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Result and discussions

A significant difference in fodder production between years was found. But there was little variations (26%) between the treatments which could possibly be attributed to a couple of outlier figures. After discarding those two values for fodder production as missing values, a regression analysis was performed. A significant difference in fodder production between years ($P = 0.001$) and between the treatments ($P = 0.023$) with variance of 34% was found. This has, however, improved the result. The cause for outliers might be due to a dying back of a couple of trees in between the observational period which resprouted.

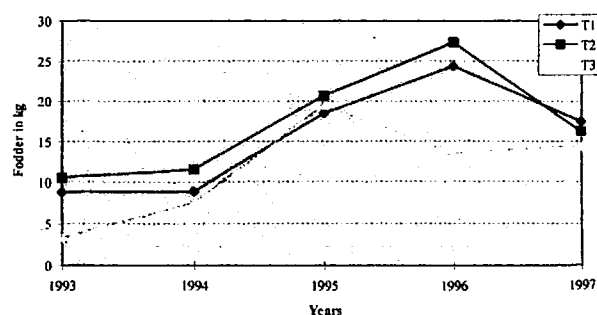
Treatments 1 and 2 were at par producing mean fresh fodder production of 15.9 and 16.0 kg respectively but significantly different from the treatment 3. The latter produced only 11.4 kg of fresh biomass (table). This clearly indicated that the pollarded regimes have advantage over the traditional lopping practice with regard to the fodder production of *Litsea monopetala*.

Table: Mean fresh fodder production in different treatments

Treatment	Mean fodder (kg)	Sd
Pollarded at 1.5 m above the ground level	15.89	1.37
Pollarded at 1.5 m in the first year but followed traditional farmers' lopping practice	16.02	1.47
Traditional lopping practice	11.43	1.40

There is a linear increasing trend of fodder production (Figure) however, the the same for treatment 3 declined in the fourth year. Similarly, at the end of the study period, the production of the treatments 1 and 2 also declined which may be due to the browsing of lower branches by buffaloes and cattle tied on the studied individual trees.

Figure : Annual fodder production of *L. monopetala* in different treatments



Conclusion

Differently pollarded and lopping regimes have shown some advantage over traditional practice. Especially the trees pollarded at 1.5 m in the first year followed by the traditional practice gave better fodder production than that of the others. This study would have given more precise results had its period been prolonged for a couple of years more. Most of the trees observed are just at their early stage of maturity. This type of research should be designed by covering many sites representing a wide range of research domains. Pollarded tree has less shading effect on crop and occupies small space in bariland systems, which could be compatible with the hill agroforestry practice. This will also provide the fodder collectors, especially the women easy access for harvesting.

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