

Assessment of fodder yield from *Artocarpus lakoocha* and *Bauhinia purpurea*) tree planting in community forests in the western midhills of Nepal

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This experiment assessed the yield and growth performance of the fodder tree planting in the community forest focusing on *Artocarpus lakoocha*, *Bahunia purpurea*. Major variables analyzing the yield and growth of the species such as dbh, height, green weight of the foliage was measured. After analyzing the data, *Artocarpus lakoocha* was found to be good yielding and growth performing species as compared to *Bahunia purpurea*. Preliminary result shows that yield of the both the species is significantly correlated with dbh and height.

Key words: *Artocarpus lakoocha*, *Bahunia purpurea*, fodder, plantation, community forest, yield

Tree fodder provides diverse needs of farmers, and contributes to the rehabilitation of degraded lands. The scarcity of fuelwood and fodder in Nepal is felt not only because the limited area under forests and the rapidly growing population (25.4 million), but also the very low productivity. We have large area shrub land of over 10.6% of total area of the country, some of which could be utilized for growing fodder cum fuelwood trees in the degraded area of the community forests. Tree fodder and green grasses contribute about 42 per cent of the total nutrients provided to the ruminants (Panday, 1991). Study that showed there is considerable fodder deficit in Nepal -as much as 20% of the present level of demand (Pandey, 1982)- has in recent years favour the planting of fodder species like *Artocarpus lakoocha* (Badahar) and *Bahunia purpurea* (Tanki) in marginal lands as well as the degraded forestlands. It was also reported that Badahar and Tanki were top ranked species by the farmers in terms of feeding value to the animals (Devkota, et al., 1995).

Badahar (*Artocarpus lakoocha*) as described by Vaidya and Gautam, 1989, it is a medium sized tree, occurring naturally from the Terai to about 1600m and grows best on deep permeable soil with a good supply of moisture. Tanki (*Bahunia purpurea*), as described by Kharel *et.al.*, 2000, a moderate light demanding tree species is found in all regions of Nepal, up to 1600m altitude. It is one of the most important native fodder trees, which increases in milk,

yield from feeding this fodder to buffalo. The main season for utilization of fodder in most places is from November to February but old trees can be lopped twice yearly, first in February-March and second in April-May from the new flush.

Because of limited private lands, farmers are bound to use the common property resources, particularly the forests to feed their livestock (Singh, 2000). In this context, fodder trees planting in the community forest could be a viable option for fulfilling the green forage requirement for livestock. All the land available for planting fodder trees is marginal and abandoned farm or rangeland (Karki and Gold, 1992). Planting, managing and utilizing of fodder trees in community forest are common practice by forest users in western region of Nepal.

There is lack of information about fodder yield planting in the degraded land of community forestry, which is necessary to determine its optimal use as a cultivated fodder tree. Therefore, the study 'Assessment of fodder (*Artocarpus lakoocha* and *Bahunia purpurea*) yield planting in community forest in the hill region of western development region of Nepal is carried out. Main objectives of this experiment are to assess fodder production or yield from planting fodder tree in community forest and assess the role of fodder for the livelihoods of the users. Preliminary result of this study was analyzed and interpreted in this paper.

Methodology

This study site is located in Jayakot plantation area of the Jayakot community forest, Kahun VDC ward no: 2, Kaski, which is being managed by Joshila Ama Samuha (a sub-group of the community forest user group) and lies in the eastern part of Pokhara valley having south-east aspect with 20° slopes. The site has annual rainfall 293.7cm and mean annual temperature 22°C.

The study site is located at the open land adjoining the community forest and the users of the community forest had randomly planted the different fodder species (*Artocarpus lakoocha*, *Babunia purpurea*, *Ficus cunia*, *Ficus subincisa* and *Litsea monopetala*) in 1998/99 with the assistance of Tree Improvement and Silviculture Component (TISC), Pokhara. The study was focused on *Artocarpus lakoocha*, and *Babunia purpurea* therefore, in the first year 2061 and only these species were measured. Major fodder trees of each species for the study were selected by taking criteria developed by researcher and local users, which were minimum three trees from each diameter class, should be measured. DBH and Height was measured by using measuring tape and Green Weight of the foliage was measured by harvesting the selected tree as generally the users practicing *i.e.* lopping all the foliage of the tree. Oven Dry Weight was measured taking the sample of each species and keeping into the oven at 60° for 5.6 hours to calculate the moisture content in the leaf and twigs.

Simple statistical tools-mean, percentage, standard deviation, correlation coefficient and coefficient of variation were computed to assess the growth performance variables viz. yield, diameter at breast height and height growth of the tree.

Results and discussion

Study variables relationship

Correlation coefficient is a measure of linear association between two variables. The correlation between dbh and yield of fodder twigs and height and yield of fodder twigs was calculated for each species. The Table:1 shows that a significant, strong and positive correlation exists between dbh and yield and height and yield in case of both the species.

Yield and growth performance

As described by Vaidya and Gautam, 1989, *Artocarpus lakoocha* can be lopped for fodder after it is about four years old. Estimation of fodder yields vary considerably from 36 to 270 kg of fresh matter per year for a mature tree; an average of 128 kg /tree/year. The *Babunia purpurea* has the average yield from mature trees is in the range of 21 to 111kg and the crude protein content of its fodder is approximately 12.6 percent (Kharel et.al., 2000).

At the age of five years, yield and growth performance of *Artocarpus lakoocha* was found better than that of *Babunia purpurea* (Table 2). *Artocarpus lakoocha* attained 4.5 cm mean dbh and 3.5 m height but *Babunia purpurea* attained 2.5cm mean dbh and 2.4m mean height. Mean yield (green twigs) of *Artocarpus lakoocha* is 5.14 kg, which is two times more than that of *Babunia purpurea* 1.94 kg. Moisture content percentage of fodder with small twigs of *Artocarpus lakoocha* was found 52.09% and fodder with small twigs of *Babunia purpurea* was found 51.12%.

The result shows that the variability in both the species is high. The sources of variation, due to the inherent variability of the species and micro-environmental effect for growth and development

Table 1 : Correlation between height and dbh with yield (freshly cut twigs).

S.N.	Species	DBH and yield	Height and yield	Remarks
1	<i>Artocarpus lakoocha</i>	0.9373	0.9260	All values showed significant relationships.
2	<i>Babunia purpurea</i>	0.9656	0.9762	

Table:2, Growth performance and variation in total green weight of twigs(kg), at the age of five years, Jan-2005, n=30 for each species.

S.N.	Species	Mean DBH (cm)	Mean Height (m)	Mean yield of twigs (green wt. in kg)	Coefficient of variation	Moisture content	Remarks
1	<i>Artocarpus lakoocha</i>	4.5	3.5	5.14	32.60	52.09%	
2	<i>Babunia purpurea</i>	2.5	2.4	1.94	44.02	51.12%	

of the fodder tree should be examined. Within inherent variability could break down as seed source, nursery stage and planting stage and similarly within the micro-environmental effect could break down as inherent soil properties, moisture level and configuration of the land.

Conclusion

Artocarpus lakoocha was found better performer than *Bahunia purpurea*. Correlation between dbh and yield and height and yield was significant for both the species. Between height or diameter at breast height, any variable could be used for assessing the yield of the fodder. Co-efficient of variation was found wide-ranging due to inherent variability of the species and micro-environmental effect and these types of sources of variation should examine more in detail for this study.

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