(II)

DEVELOPMENT OF RHIZOME BANKS FOR BAMBOO MULTIPLICATION

Introduction

The gregarious flowering nature of bamboos is often a limitation for the availability of bamboo seeds for propagation. Propagation from rhizomes of unknown age is also dangerous as the plants may flower and dry before their economic use starts. In order to have certified rhizome source with known age from seed germination, there is necessity to have dedicated permanent high density plantation nurseries. These nurseries would be known as 'rhizome banks', which would ensure regular supply of rhizomes for further plantation and nursery raising and multiplication. The rhizome banks can be maintained at least up to half flowering age and later for seed production. The rhizome banks can also be used for economic harvest of bamboo culms and bamboo shoots.

Establishment

The rhizome banks should be developed by planting seedlings in close spacing of 1 m x 1 m in case of 'ringaals' (montane bamboos like *Arundinaria falcata*) and 2 m x 2 m or 1 m x 2 m in case of *Dendrocalamus strictus* and other bamboos with small clump diameter. For other species of sympodial bamboos with larger clump diameter and for monopodial species 2 m x 2 m spacing can be adopted. Thus a rhizome bank would have plants upto 2,500 to 10,000 per hectare depending on the species. The plants should be planted in pits of 30 cm^3 in case of ringaals and 45 cm^3 in case of other bamboos. The pits should be filled with top soil and decomposed manure or compost before planting for better growth of rhizomes. The seedlings should be at least six months old while planting. The interspaces should be scrapped of weeds for the first year and the dried weeds should be put on the planted pits for adequate moisture conservation. The interspaces should not be ploughed or harrowed as this activity may destroy the growing rhizomes. The plantation may be irrigated in case of extreme drought in the first year. The leaf litter should not be removed from the rhizome bank. The rhizome bank should be protected from herbivores for the first few years.

Utilization

The rhizome bank should be maintained for at least two years before it can be used for separation of rhizomes. The rhizome extraction should be done in a three year interval. Every third row can be uprooted for separation of the rhizomes. One plant can give on an average ten rhizomes for field planting and many more for nursery purposes. One of the rhizomes should be replanted in the rhizome bank, while the others are taken for field planting or nursery purposes. The adjacent rows should be used the next year and so on so that the rhizome that has been planted back in the bank is again available for rhizome extraction after three years.

The rhizomes separated should contain one mother culm and at least two buds for field planting. The culm should not be cut in case of field planting in elephant rich areas. The mother culm will cater to the needs of the elephant, thus protecting the underground rhizomes. The culms can also be used for flute method of vegetative propagation. Rhizome banks also save high investment and space on traditional annual nursery techniques. Further, these banks ultimately can become high density commercial plantation and finally could end up as a certified seed source. Rhizome banks created from different provenances can ensure steady supply of seeds also without waiting for one gregarious flowering regime.

Rhizome banks developed so far in Uttarakhand

The research wing of the Uttarakhand Forest Department has established rhizome banks at different places all over the State. Details are as given in Table 1.

Fig. 1

One year old high density rhizome bank of *Dendrocalamus membranaceus* at Shyampur, Haridwar.

Table 1

Rhizome banks at different places in Uttarakhand State

Sl. No.	Species	Place	No. of plants
1.	*Arundinaria falcata*	Deoban (Chakarata Forest Division)	30000
2.	*Dendrocalamus strictus*	Binhar, Kalsi Soil Conservation Division	3000
2a.	*Dendrocalamus strictus*	Fatehpur, Dehra Dun Forest Division	250000 (proposed)
3.	*Dendrocalamus hamiltonii*	Bhujiaghat, Nainital Forest Division	100
4.	*Bambusa bambos*	Shyampur, Haridwar Forest Division	100
5.	*Melocanna baccifera*	Shyampur, Haridwar Forest Division and Gaza (Jeolikote), Nainital Forest Division	1000
6.	*Dendrocalamus membranaceus*	Tanda and Lalkuan, Terai Central Forest Division	20000
7.	*Thrysostachys siamensis*	Tanda, Terai Central Forest Division	25000
8.	*Dendrocalamus asper*	Shyampur and Lalkuan	1000

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