

Plantation Research in Jharkhand, India

1. Growth performance of Multipurpose species

To study growth performance multipurpose species were planted in 1978 and 1979 at a spacing of 2m x 2m at Maheshpur and Gamharia Research Centres and it was observed that Eucalyptus got maximum height and average height. Gmelina arborea had lowest mortality. In Gamharia Research Centre Bauhinia purpurea got the maximum height and average height while Terminalia belarica had lowest mortality.

This experiment was also conducted during 1981 at Kushabija Research Centre by changing the spacing. The spacing of 2m x 3m was taken in place of 2m x 2m and it was observed that prosopis juliflora got the maximum height and average height while zizyphus jujuba had the lowest mortality.

The above experiment was again conducted during 1988 in all four Research Centres i.e Maheshpur , Gamharia , Motileda and Kushabija as per decision of Research committee held in May' 1988 and observed that Holoptela integrifodia got the maximum and average height in Maheshpur while phyllanthus emblics in Kushabija as well as Gamharia and Terminalia chebula got the maximum average height.

2. Weeding & hoeing experiment

To study the effect of the different number of weeding & hoeing on the plantation an experiment was conducted at Gamharia Research Centre on Eucalyptus taking two different frequency of weeding & hoeing operation i.e. two weeding & hoeing operation and three weeding & hoeing operation. It was concluded that two weeding & hoeing operation was more effective compared to three weeding hoeing operation.

3. Pit size experiment

In 1979 Gamharia Research Center acacia auriculiformis was planted in the pit's sizes of 30 cm x 30cm x 30cm and 45 cm x 45 cm x 45cm. The pit's size of 45 cm x 45 cm x 45 cm was found more effective.

Acacia Catechu was planted at spacing of 2m x 2m in different pit's sizes i.e (a) 30cm x 30cm x 30cm and (b) 45cm x 45cm x 45cm in 1979 at Kushabija Research Center. The pit size of 45cm x 45cm x 45cm was found significantly better but the economics did not permit it for future use due to the cost.

4. Different height of seedlings experiment

To observe the growth performance of seedlings having different heights, Eucalyptus hybrid seedlings having different heights : (i) 30 cm to 38 cm and (ii) 60 cm and above were planted during 1979 at Gamharia Research Center at a spacing of 2m x 2m and it was conducted that seedlings having height 30 cm to 38 cm were found better in all respect.

5. Provenance Trial of Eucalyptus toreti cornis and Eucalyptus camadulenses

For provenances of Eucalyptus toreti cornis named as S.Lawra , Mount poverty, Cook tork, W.N.Morreba , Mt. molly and Eucalyptus hybrid trials were undertaken at Gamharia Research Centre at a spacing of 2m x 2m and it resulted that W.N.morreba was found better in volume production. Similarly in case of provenance trial for provenances of Eucalyptus camaldulensis Katherine gave the best result.

6. Age-spacing volume relationship

As per decision of Research committee held in May' 1988 SEAC species (Sissoo , Eucalyptus , Acacia auriculiformis and Casia siamea) were planted during 1988 in R.B.D. at all the four Research Centre at different spacing i.e. 1m x 1m , 1m x 2m , 2m x 2m , 2m x 3m and 3m x 3m respectively.

It was observed that Acacia auriculiformis planted at a spacing of 1m x1m was found statistically better at all four Research Centres. Sissoo at a spacing of 2m x 2m in Maheshpur , 1m x 1m in Gamharia , 1m x 2m in Kushabija was found better while there was cent per cent mortality in Motileda Research Centre due to biotic pressure.Eucalyptus at a spacing of 1m x1m in Maheshpur, Gamharia and Kushabija was found better while spcing of 1m x 2m was found better in Motileda. Cassia siamea at spacing 1m x 1m in Maheshpur and Gamharia and at the spacing of 1m x 2m in Kushabija showed better result while in Motileda mortality was cent per cent due to biotic pressure.

7. Trial plantation of Prosopis juliflora

Prosopis juliflora was planted in 30 cm cubes and 45 cm cubes at different spacings i.e. 2m x 2m , 2m x 3m , m x 3m , 4m x 1m , 6m x 1m and 9m x 1m respectively at Maheshpur , Motileda and Kushabija and prosopis juliflora was not found satisfactory. It was observed that P.juliflora was suitable for natural and alkaline soil.

8. Observation of growth statistics of main species-Acacia , Eucalyptus, Sissoo an Cassia siamea mixed other indigenous multipurpose species

To compare the growth performance main species were planted mixed with other species in all four Research Centres and it was observed that Acacia , Eucalyptus, Sissoo and Cassia siamea in Maheshpur , Acacia , Prosopis juliflora , Bauninia variegata and Eucalyptus in Gamharia , Acacia , Sissoo and Eucalyptus in Kushabija while Acacia, Khair, Kachnar and Eucalyptus did better in Motileda.

9. Tissue culture experiment

To observe that the growth performance plantlets of Bambusa arundinacea and Dendrocalamus strictus raised by the method of Tissue culture planted in all four Research Centres and the height of clumps as well as no. of culms were recorded. Correlation coefficient between the no. of culms and the height of the culms was calculated and found that the no. of culms and the height of the culms were directly proportional to each other while indirectly proportional in case of Bambusa arundinacea at Maheshpur Centre.

1.No	Research Center	Species	
		Bambus arundinacea	Dendro calamus
1	2	3	4
1.	Maheshpur	The no. of culms and height Of the clump were indirectly proportional to each other	Dendro calamus strictus directly proportional to each other
2.	Kushabija	Directly proportional to each other	- do -
3.	Motileda	- do -	- do -
4.	Gamharia	- do -	- do -

10. Research for hetenozygosity

To achieve a tree of superior genetic quality heterozygosity experiment were carried out in a no. of Afforestation Division during 1990-91, 200 seedlings having best height & health, having straight stem and which showed no sign of any distress/disease, , were singled out from the rest of the nursery plants and planted in the afforestation block usually a Central place at a same spacing at which the plantation has been done. They were subjected to same cultural operation as the rest of the plantation Block. The plants in the hetenozygosity block achieved decidedly a better height growth.

11. Efeffect of micro-nutrients on the growth of slow growing species.

To watch the growth of slow growing plants micro nutrients were applied at Maheshpur , Gamharia and Kushabija Research Centre and observed a little affect of nutrients on Jamuan and Siris.

12. Comparative study of Acacia sieberiana and Acacia auriculiformis

Some seed of Acacia sieberiana were sent by F.R.I. Dehradun during 1969-70. The seedlings were transplanted in the field of Mahilong Forester's Training School at a spacing of 3m x 3m in the pits of 30cm x 30cm x 30cm. During 1986-87 seedling of the same species were raised in the nursery at a spacing of 2m x 2m in the pits of 45cm x 45cm x 45cm size. The yield of Acacia siberiana and Acacia auriculiformis was compared and concluded that Acacia siberiana was preferable to Acacia auriculiformis in terms of yield per hectare and yield per tree per year. The plantation of Acacia sieberiana was found advantageous as well since leaves are not palatable to the cattle and even goat. The presene of thorn is another protective feature against grazing and pollarding. It can grow in acidic soil as well as yields gum also. Desi Babul (*Acacia nilotica*) does not thrive well in acidic soil.

13. Trial of exotic species simaruba glauca

During 1988, the trial was conducted in Motileda, Gamharia and Maheshpur Research Centres and it was concluded that *S.glauca* can be used as a bio-barrier for grazing prone timber species , Bamboos and other medicinal plants. This species is ever green and oil yielding.

14. J.F.M study

This study was carried out in 1995 on saiding Reserve Forests considering under J.F.M. and Dundum Reserve Forests considering under usual departmental protection. The Forest was divided in two groups i.e. (i) of to years (ii) more than 5 years. The volume of *Shorea robusta* was calculated and it was found that the area under J.F.M. was better.

15. Growth performance of multipurpose indigenous species

Multipurpose indigenous species were planted during 1988 at all four Research Center, the result was as follows. In Maheshpur *Holoptelea integrifolia* had maximum average height and lowest mortality. In Gamharia & Kushabija *phyllanthus emblica* got maximum average and lowest mortality , while in Motileda *Terminalia chebula* got maximum average height.

16. Biomass study

Biomass study of *Acacia auriculiformis* planted during 1978, 1979 and 1980 at the spacing of 2m x 2m and 3m x 3m at Motileda was carried out. The total standing biomass (Kg / ha) and productivity (Kg / ha / year) at the spacing of 2m x 2m were better while rate of Accumulation of dry matter (Kg / tree / year) at the spacing of 3m x 3m was the highest