

## NEW TECHNICAL PROGRAMME

### Department of Forest Biology and Tree Improvement

#### Experiment No. 21.5.3.7

01.	Experiment No. and Title	:	<b>Tree selection and progeny evaluation of Khati Chamol (<i>Bauhinia malabarica</i> Roxb.) at Nursery stage</b>
02.	Budget Head	:	12065 and 12036
03.	Collaborative department, if any	:	SAF & FPU
04.	Background information	:	<p>Khati Chamol, <i>Bauhinia malabarica</i> Roxb. (Family: Fabaceae), is an evergreen tree distributed in different parts of India including Gujarat. <i>B. malabarica</i> occurs in the middle story of South and North Indian moist deciduous forests as well as Northern tropical dry deciduous forests. It is recorded to be, Species is considered as lesser known and categorized as vulnerable. During field visits, it is noticed that few trees were tall and round in stem structure and such trees can be utilized for production, conservation and further utilization. Information about improvement and utilization of this species is scanty and there is a need to work out tree improvement of this species. Tree selection and evaluation is main objective of tree improvement. Further, production of quality seedling is also essential for plantation purpose. Therefore, the present study is proposed to select and evaluate the candidate plus trees of <i>B. malabarica</i> through progeny trial at nursery stages. Later, good quality planting materials raised from selected CPTs will be field planted in the Farm of College of Forestry, NAU, Navsari for their preservation and growth attributes. Study will be carried out with following objectives:</p>
	Hypothesis	:	Is there any variation among Candidate Plus Trees (CPTs) of Khati Chamol ( <i>Bauhinia malabarica</i> Roxb.) for seed germination and seedling growth and vigour under nursery condition?
05.	Objectives	:	<ol style="list-style-type: none"><li>1. To select Candidate Plus Trees (CPTs) of Khati Chamol (<i>Bauhinia malabarica</i> Roxb.)</li><li>2. To understand the seed germination pattern among selected CPTs</li><li>3. To evaluate progenies for early growth and vigour under nursery condition</li></ol>
06.	Principal investigator and associates	:	<b>PI:</b> Dr. R.P. Gunaga, Professor (Forest Biology) <b>Co-PI:</b> 1) Dr. L.K. Behera, Associate Professor (Silviculture)

			2) Dr. S.A. Huse, Associate Professor (Tree Improvement) <b>Associate Scientist:</b> 1. Dr. M.S. Sankanur, Associate Professor (Tree Improvement)
	SRFs		1. Dr. Minal H. Patel 2. Mr. Chinatan A. Dholariya
07.	Location and Agro-climatic sub-region	:	South Gujarat (Heavy rainfall zone, AES- III)
08.	Year and Season	:	Commencement Year - 2025-26
09.	Crop and Variety	:	Khadi Chamol ( <i>Bauhinia malabarica</i> Roxb.)
10.	Experimental details	:	
	(a) Treatments	:	Individual Candidate Plus Trees (CPTs) will be considered as Treatments Minimum 15 CPTs will be selected from study area
	(b) Experimental Design	:	CRD
	(c) Repetition	:	3
	(d) Plot size (if applicable)	:	Gross - _____ m x _____ m
		:	Net - _____ m x _____ m
	(e) Spacing	:	NA
	(f) Seed rate (kg/ha)	:	NA
	(g) Manures and fertilizer	:	NA
	(h) Any other detail, if required	:	NA
11.	Observations to be recorded	:	<p>➤ <b>Tree observation</b></p> <ol style="list-style-type: none"> <li>1. Tree height (m)</li> <li>2. GBH (cm)</li> <li>3. Clear Bole Height (m)</li> <li>4. Commercial Bole Height (m)</li> <li>5. Crown length (m)</li> <li>6. Crown height (m)</li> <li>7. Crown diameter (m)</li> <li>8. Branch angle (°)</li> <li>9. Stem form (Straightness and Roundness)</li> <li>10. Mid diameter (cm)</li> <li>11. Form quotient</li> <li>12. Bark thickness (mm)</li> </ol> <p><b>Yield parameters</b></p> <ol style="list-style-type: none"> <li>13. Volume (m<sup>3</sup>)</li> <li>14. Biomass (kg per tree)</li> <li>15. Carbon content (kg per tree)</li> </ol> <p>➤ <b>Pod and Seed traits</b></p> <ol style="list-style-type: none"> <li>16. Pod length (mm)</li> <li>17. Pod width (mm)</li> </ol>

			<ul style="list-style-type: none"> <li>18. Pod thickness (mm)</li> <li>19. Seed length (mm)</li> <li>20. Seed thickness (mm)</li> <li>21. Seed width (mm)</li> <li>➤ <b>Germination attributes</b> <ul style="list-style-type: none"> <li>22. Germination percentage</li> <li>23. Mean Daily Germination (MDG)</li> <li>24. Peak Value of Germination (PV)</li> <li>25. Germination Value (GV)</li> <li>26. Mean Germination Time (MGT)</li> <li>27. Germination Rate Index (GRI)</li> </ul> </li> <li>➤ <b>Seedling growth and vigour parameters</b> <ul style="list-style-type: none"> <li>28. Shoot height (cm)</li> <li>29. Basal diameter (cm)</li> <li>30. Number of leaves per plant</li> <li>31. Fresh weight of shoot and root (g)</li> <li>32. Dry weight of shoot and root (g)</li> <li>33. Root: Shoot ratio</li> <li>34. Sturdiness quotient</li> <li>35. Seedling quality index</li> </ul> </li> </ul> <p>Seedling growth and vigour parameters should be taken after 6 months of transplanting</p>
12.	Methodology	:	
	<p>Minimum 15 trees will be selected in different Khati Chamol (<i>Bauhinia malabarica</i> Roxb.) populations located at Amania, Ambapani, Dabdhar, Sadarpani, Medha, Chunavadi and surrounded forest area of south Gujarat will be explored. Based on selective sampling technique, superior individuals (CPTs) will be marked and biometric observation of marked trees will be measured using different instruments viz., Tree Calliper, Electronic Clinometer, and Criterion Dendrometer including measuring tape, by following tree improvement guidelines. Pods will be collected from these selected CPTs. Healthy pod &amp; seed will be used for observation. Germination experiment will be carried out in the LKTs project forest nursery of College of Forestry, NAU, Navsari. Common seed treatment-Soaking seed in concentrated sulphuric acid (98%) for 30 min followed by soaking in normal water for 24 hrs will be used. Germination trial will be conducted in germination tray using Soil: Sand: FYM mixture in 2:1:1 ratio and trays will be arranged in CRD. For each CPTs, 300 seeds (100 seeds per repetition) will be used depends upon the seed availability. Daily germination count will be made and later, two leaves stage seedlings will be transplanted into polybag of size 6" x 8" containing Soil+ Sand + FYM (2:1:1) for growth experiment (progeny trial). For each CPTs, 60 seedlings (20 seedlings per repetition) will be used for growth observations. Further, data will be analysed statistically using CRD with the help of statistical softwares and data will be arranged in tabular form for data presentation.</p>		