

NEW TECHNICAL PROGRAMME

Department of Natural Resource Management

Experiment No. 21.5.3.14

01.	Experiment No. and Title	:	Effect of different salinity levels of irrigation water on Karanj [<i>Pongamia pinnata</i> (L.) Pierre] seedlings
02.	Budget Head	:	12101
03.	Collaborative department, if any	:	-
04.	Background information	:	
	<p>Salinity impacts the availability of nutrients to plants, which can influence metabolism and osmoregulation of plant cells. Furthermore, it regulates the absorption and delivery of nutrients among various plant parts. Due to its limiting influence on plant photochemistry, salt inhibits the synthesis of chlorophyll, which hinders photosynthesis and reduces growth. Some tree species maintain a high osmotic potential by accumulating a compatible solute (Proline) in their cytoplasm to deal with the saline environment. <i>Pongamia pinnata</i> is a fast-growing multipurpose tree species that can be found in slightly salty to moderately saline conditions in coastal areas. This species has received a lot of attention for its nitrogen fixing capacity, good coppicing ability, and ability to endure water logging. For plantations on the salt-affected marginal land and coastal embankments, choosing the right plant species is crucial. <i>P. pinnata</i> may be a suitable species for planting in salt-affected areas. However, research on the survival and growth of this species at various salinity levels is currently limited. Therefore, the current study was aimed to examine the influence of salinity on survival, growth, and nutrient content in <i>P. Pinnata</i> seedlings.</p>		
	Hypothesis	:	The present study is proposed with the null hypothesis (H ₀) that different salinity levels of irrigation water will not affect the growth and nutrient content of <i>P. pinnata</i> seedlings
05.	Objectives	:	<ol style="list-style-type: none">1. To study the effect of different salinity levels of irrigation water on growth performance of <i>P. pinnata</i> seedlings2. To study the effect of different salinity levels of irrigation water on nutrient content of <i>P. pinnata</i> seedlings
06.	Principal investigator and associates	:	PI: Dr. A. A. Mehta, Assoc. Professor (FPU) Co-PIs: Dr. D. P. Patel, Assoc. Professor (NRM) Dr. L.K. Behera, Assoc. Professor (Silviculture) Associate scientist: Dr. R. P. Gunaga, Assoc. Professor (AF/FBTI) SRF: Dr. Govind
07.	Location and Agro-climatic sub-region	:	Poly house, College of Forestry, NAU, Navsari South Gujarat Heavy Rainfall Zone (AES –III)
08.	Year of commencement	:	2025

09.	Tree species	:	<i>Pongamia pinnata</i>
10.	Experimental details	:	
	(a) Treatments	:	Water salinity levels: T ₁ : Available water T ₂ : 4.0 dS/m T ₃ : 8.0 dS/m T ₄ : 12.0 dS/m T ₅ : 16.0 dS/m T ₆ : 20.0 dS/m T ₇ : 24.0 dS/m
	(b) Experimental Design	:	CRD
	(c) Replications	:	3
	(d) Plot size (if applicable)	:	NA
	(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	:	Soil properties (Initial and after completion of the experiment) <ol style="list-style-type: none"> pH EC (dS/m) Organic Carbon (%) ESP Available NPK (Kg/ha) Growth parameters (at 6 months interval): <ol style="list-style-type: none"> Plant height (cm) No. of leaves per plant Survival (%) Collar diameter (mm) Shoot biomass (g) (At end of experiment) Root biomass (g) (At end of experiment) Nutrient content <ol style="list-style-type: none"> N, P, K, Ca and Na content (%) in leaves, stem and root of <i>P. pinnata</i> seedlings
12.	Methodology Experiment will be carried out in polythene bag having capacity of 5 kg soil. Seeds will be directly sown in polythene bags and after establishment of seedling, different salinity treatments will be imposed on uniform and healthy seedlings (at the time when seedling would be ready to plant in field). 5 plants will be taken per repetition for observation at 6 months after imposition.		