Theme 1: Sustainable Developments & Green Economy
Sub-theme 1.1: Bamboo forest management

Impact of moisture content of branch cuttings on rooting behaviour in genotypes of *Dendrocalamus strictus*

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INTRODUCTION

- Important non-timber forest products
- Carbon sequestration and climate change mitigation
- Bamboo forest management
- Bamboo propagation

INTRODUCTION

Dendrocalamus strictus **is a drought resistant tropical bamboo.**

It has economic and ecological importance.

Fig 1: D. strictus clump in germplasm

a) Node with multiple branches

b) Flowers of D. strictus

c) Seeds of D. strictus

Fig 2: Different parts of D. strictus

Moisture is one of the most important resources necessary to bamboo's growth during early growth and development.

Moisture content of bamboo is a critical factor for its use as a structural element.

Fig 3: Young shoot of D. strictus

WHY?

Due to challenges related to its propagation and cultivation.

The ability of bamboo genotypes to root effectively can significantly impact their adaptability to different ecological niches and their overall health and vitality.

Study of rooting behavior with respect to its moisture content is of high importance.

METHODOLOGY

Study Site

Fig 4: Germplasm of *Dendrocalamus strictus* at FRI, Dehradun, India

Selection of plant material

Genotype	Code No.	Source	Place of Collection
G1	71	Haryana	Pinjor, Panchkula
G2	107	Uttarakhand	Kalshi
G3	159	Rajasthan	Udaipur
G4	59	Tamil Nadu	Amravathi
G5	170	Uttar Pradesh	Mirzapur

Table 1: Details of the selected genotypes of *D. strictus*

Fig 5: Map of India showing the geographical distribution of the selected genotypes.

Moisture content estimation

Fig 6: Moisture content of branch cuttings by oven drying at 80 °C

$$\text{Moisture Content \%} = \frac{\textit{Weight of moist Bamboo shoot} - \textit{Weight of oven dried bamboo shoot}}{\textit{Weight of moist bamboo shoot}} \times 100$$

Ex vitro Propagation

a) Collected branch cuttings from Germplasm

b) Fungicidal treatment

c) Planting of binodal branch cuttings

Fig 7: Macropropagation of the binodal branch cuttings in glasshouse

RESULT- Moisture Content

Genotype	Moisture Content %
G1	$54.85^{a}\pm0.26$
G2	$56.05^{a}\pm2.19$
G3	$70.40^{b}\pm1.94$
G4	$63.97^{ab}\pm3.24$
G5	$55.18^{a}\pm1.77$
F value	9.56
p value	< 0.05
S/NS	S

Table 2. Moisture content in branch cuttings of the selected genotypes

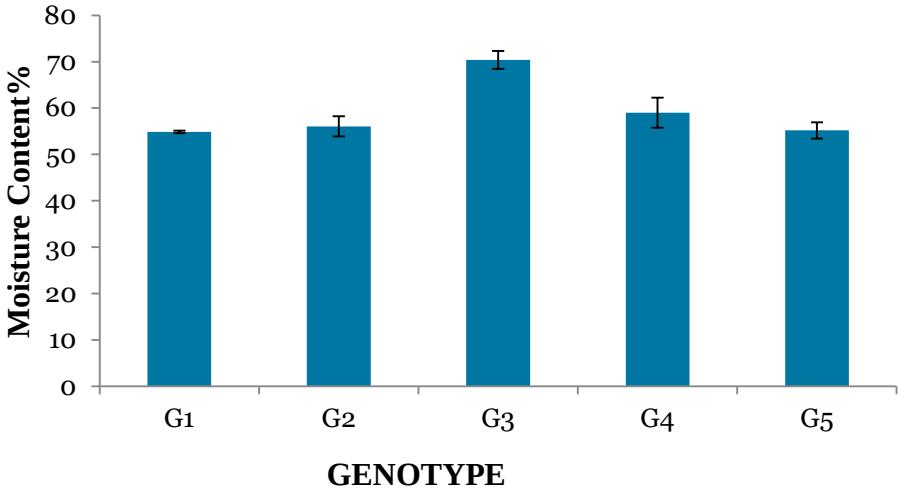

Fig 8: Moisture content% in the branch cuttings of genotypes of *D. strictus*

Rooting behaviour of *D. strictus*

Genotype	Rooting %	No. of Roots	Root length (cm)
G1	43.33^{b}±1.34	2.07±0.10	13.64^{a}±0.86
G2	40.00^{ab}±1.61	1.03±0.10	18.26^{b}±0.70
G3	53.33^{c}±2.42	2.33±0.11	40.31^{c}±1.53
G4	53.33^{c}±2.00	1.70±0.11	34.17^{bc}±1.10
G5	36.66^{a}±1.58	2.90±0.12	16.53^{b}±1.12
F value	10.199	0.753	18.516
P value	< 0.05	0.557	< 0.05
S/NS	S	NS	S

Table 3: Rooting behaviour of the selected genotypes of *D. strictus*

Correlation between moisture content and rooting behaviour of the genotypes

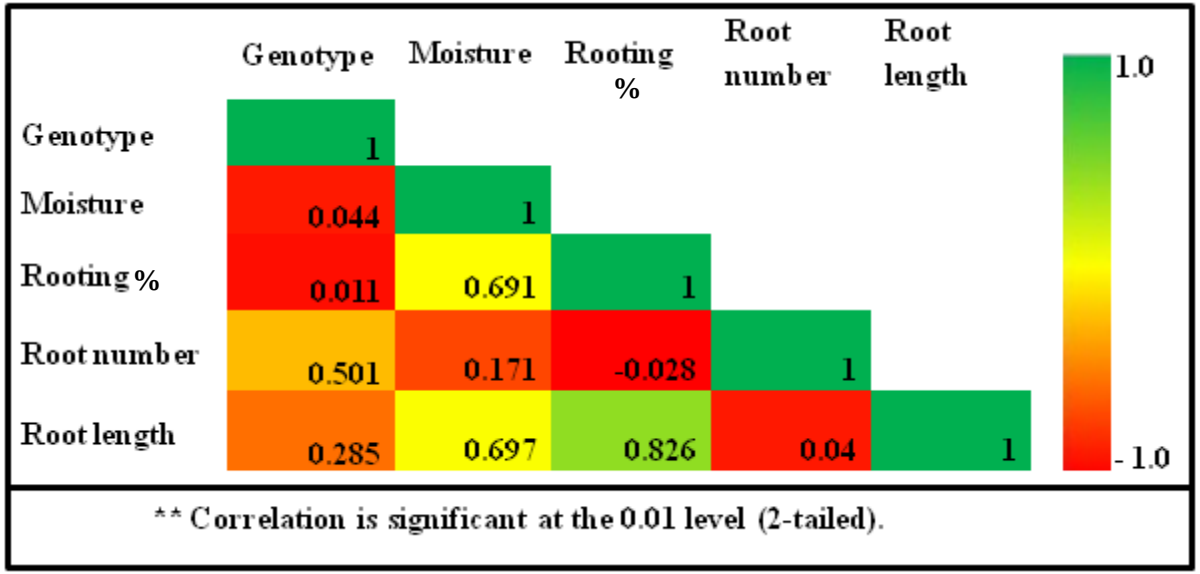

Fig 9: Correlation matrix depicting relation among various factors

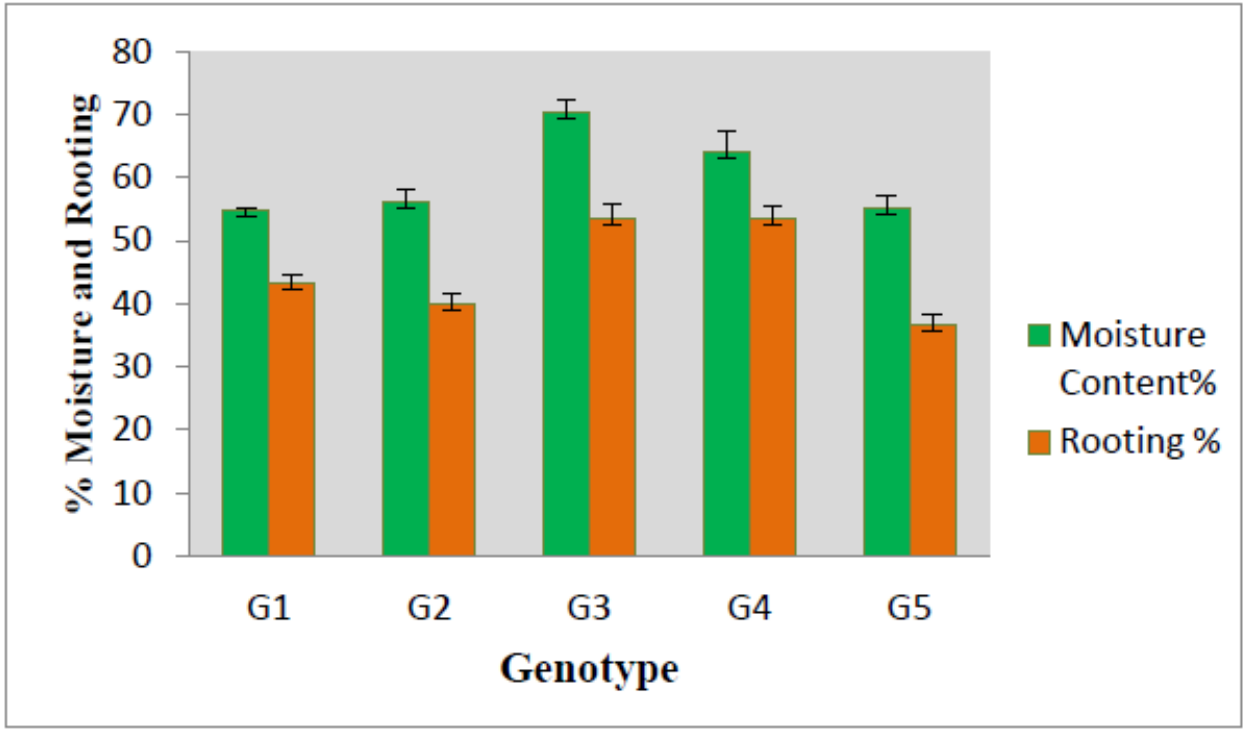

Fig 10: Effect of moisture content on rooting percentage of *D. strictus genotypes*

Conclusion

Response to varying moisture content is of paramount importance.

It can develop an understanding on how *D. strictus* genotypes respond to different moisture levels, and help identify genotypes that are well-suited to specific ecological conditions.

Bamboo forest management should be adapted to local conditions and objectives, as bamboo ecosystems vary significantly across regions and climates.

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