

RESEARCH REPORT - SYNOPSIS



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Studies on standardization of elite nursery technique in papaya (*Carica papaya* L.)

DISSERTATION -II REPORT

BY

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CERTIFICATE

Certified that this synopsis of Sukhjiwan Kaur Kadoll registration no. 11712116 entitled '**Studies on standardization of elite nursery technique in papaya (*Carica papaya* L.)**' has been formulated and finalized by the student herself on the subject.

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Introduction

Papaya (*Carica papaya* L.), an important fruit crop of tropics and subtropics belongs to family Caricaceae. It is the 7th consequential crop that observed to be grown commercially after mango, citrus, banana, apple, guava, sapota in accordance with the prevailing eco-physiological conditions of India. The crop tends to have its commercial method of propagation via seeds, both for dioecious and gynodioecious cultivars.

Usually, during seedling production, seed sowing taken up in polybags filled with media. So, on germination seedling vigour tends to be influenced with certain factors *viz.*, quality of seed, substrates and eco-physiological traits. In nursery production, the routine problems of less vigour, erratic nature, mortality of seedlings etc remain commonly observed, which have impact over germination rate and seedling vigour. Therefore, attention is to be rendered on such point, in promoting the production of quality planting material, especially with nursery stage.

Potting media also tends to have a vital role in enhancing the vigour and germination of seed on accordance with the growth and developmental pattern of nursery saplings, particularly with papaya. Generally, the regular potting media of soil: FYM: river sand (2:1:1 ratio) incorporated in filling of polybags in saplings production of papaya, but the affinity of media intact to root system and root proliferation activities remain a constraint forever during transplanting at main field. Moreover, size of polybags also influencing the developmental pattern of root system that have direct impact over the production of elite papaya saplings.

With this background, the present investigation has been formulated to overcome such issues in alleviating the constraints and to identify a standardized nursery technique for production of papaya saplings.

Problem Background

- Deficient systemic and accurate selection of growth media
- Dearth usage of nursery materials
- Inadequacy in knowledge on the production of elite and quality papaya saplings for planting

Review of Literature

Dayeswari *et al.* (2017) conducted an experiment to analyze the impact of various potting media on seed germination, seedling growth and vigour in TNAU Papaya CO.8 with different treatments and evaluated for its performance for crop growth and developmental phenomenon. The results of the study revealed that the treatment combination of cocopeat + vermicompost + azospirillum + phosphobacteria + *pseudomonas fluorescens* registered maximum value on seed germination percentage, seedling height, seedling girth, leaf nutrient contents, chlorophyll content and leaf soluble protein content.

According to Bhardwaj (2014), treatments with the medium combination of vermicompost + sand + pond soil (1:1:1) with 2cm cocopeat in top of the poly bags (T₉) gave maximum speed of emergence, highest germination percent (95.27 and 90.15%), highest seed vigour (91.97 and 86.69), maximum germination index (7.15 and 7.22), germination value (17.33 and 33.83) and least time required for imbibition (9.45 and 9.30 days) and minimum germination period (3.70 and 2.75 days), respectively in both years of experimentation. This medium retained superiority over the phenological performance of papaya seedlings.

Kumar *et al.* (2016) made a study to find out the impact of growing media on germination and establishment of seedlings of papaya (*Carica papaya* L.) under net house conditions. The experimental result revealed that the treatment T8 took significantly minimum days (7.00 days) for initiation of germination with considerably soared germination count (34.33 and 37.33), vigour index-I (1007.08 and 2114.42) at 15 and 30 DAS, respectively and vigour index-II (1.04) at 15 DAS. On the basis of experimental outcome, it can be concluded that the treatment containing cocopeat as a part of growing media i.e. T8, T11, T13 and T15 found to be most suitable for raising the papaya seedlings as it gives greater germination, vigour and survival of seedlings in field.

Meena *et al.* (2017) conducted an experiment to assess the “Effect of different growing media on seedling growth parameters and economics of papaya (*Carica papaya* L) cv. Pusa Delicious”. The treatments were prepared in combination between types of media with level of cocopeat having 50 polybags in each treatment and replication. The results showed that the medium of soil + vermicompost + vermiculite (1:1:1) with 2 cm cocopeat layer at top portion of polybags (T5) found to be the best and significantly superior medium for the growth of papaya.

Proposed Research Objectives

- To observe the impact of various growing media on seedling emergence
- To study the effect of various sized polybags on growth and development of elite nursery plants
- To formulate a strategy for lowering the cost in nursery raising to upsurge the farmer on high net return
- To prompt explicit evaluation of herbaceous perennial regarding growth parameters.

Proposed Research Methodology

An investigation on “**Studies on standardization of elite nursery technique in papaya (*Carica papaya* L.)**” planned for the study in shade net area of LPU farm during 2018-19.

The enumeration of materials and methodologies included for the course of study are covered below,

Treatment Details

Location	: LPU shade net (63% shade provision)
Crop	: Papaya (<i>Carica papaya</i> L.)
Varieties	: Pusa Dwarf (Dioecious), Red Lady (Gynodioecious)
Sowing months	: May - October (2018), March – April (2019)
No. of factors	: 2
Factor 1	: Size of polybags (4 types)
Factor 2	: Potting media (3 types)
Total treatments	: 12
Total replication	: 03
Experimental design	: FCRD

Observation parameters to be recorded [Phenological, physiological parameters]

- Seed germination percentage
- Seedling height
- Stem girth
- Root length
- Root thickness
- Photosynthetic activity of leaves
- Physiological performance of crop
- Nutrient uptake analysis

Semester wise work plan

1st semester

- Collection of literatures
- Finalization of research crop

2nd semester

- Preparation of project proposal
- Commencement of work plan
- Sowing of seeds
- Analysis of crop parameters

3rd semester

- Sowing of seeds
- Analysis of cropping parameters

4th semester

- Sowing of seeds
- Analysis of cropping parameters
- Statistical analysis of data
- Thesis submission

Expected Research Outcomes

- Identification of right sized polybag for nursery production of papaya
- Detection of suitable potting media for elite papaya sapling production
- Role of ecophysiological factors in successful crop production programme in papaya

References

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