

RESEARCH PROGRAMME

**Effect Of Growing Media Mixtures On Seed Germination
And Seedling Growth Of Different Mangoes(*Mangifera
indica L.*)**

DISSERTATION REPORT - 1

Submitted to the
**LOVELY PROFESSIONAL UNIVERSITY,
PHAGWARA, PUNJAB, INDIA**

in partial fulfillment of the requirements for the award of degree of

MASTER OF SCIENCE
IN
(HORTICULTURE)

BY

S. Nandini

Registration Number:

11719339

Under the supervision of

Dr. Saurabh Kumar Singh



L OVELY
P ROFESSIONAL
U NIVERSITY

**Department of Horticulture, School of Agriculture,
Lovely Professional University, Phagwara, India.**

MAY, 2018

CERTIFICATE

I hereby declare that the synopsis entitled “**Efect Of Growing Media Mixture On Seed Germination And Seedling Growth Of Different Mango (Mangifera indica L.)** is an authentic record of my work and carried out at Lovely Professional University as requirement for the degree of **Master of science** in the discipline of **Horticulture**, under the guidance of Dr. Saurabh Kumar Singh Assistant Proffessor, Department of Horticulture, School of Agriculture and no part of this synopsis has been submitted for any other degree and diploma.

S. Nandini

(Registration No. 11719339)

M. sc Horticulture

Fruit Science

CERTIFICATE

This is to certify that synopsis title “**Effect of growing Media mixtures on seed germination and seedling growth of different mangoes (Mangifera indica L.)** submitted in partial fulfilment of the requirement for the award of degree of **Master of Science** in the discipline of **Horticulture**, is a research work carried out by **S.NANDINI [Registration No:11719339]** under my supervision and that no part of this synopsis has been submitted for any other degree or diploma.

Signature of Supervisor

Dr. Saurabh kumar (21061)

Asst. Professor

School Of Agriculture

Lovely Professional University

Jalandhar,Punjab.

Signature of Co-advisor

Dr. Manish Bakshi (22187)

Asst. Professor

School Of Agriculture

Lovely Professional University

Jalandhar,Punjab.

1. INTRODUCTION

Mango (*Mangifera indica* L.) is a tropical fruit and also known as „king of fruits“ belongs to genus *Mangifera*, family *Anacardiaceae* which is grown almost all parts of the world. This genus had its origin in the continental region of Burma, Thailand, Indo-China and Malaysia peninsula as reported by. In India, it is cultivated at sub-continent for well over 4000 years. Mangoes possessing the pride position in tropical and subtropical region, between 23° North and South latitude. It is a national fruit of India because of its delicious taste, excellent flavour/aroma, attractive colour and its fruit contains 0.6% protein, fair amount of carbohydrates (11.8%), minerals like calcium, phosphorous and iron (0.3%). Its fruit is richest source of vitamin A (4800units), B1andB2 (90mg) and vitamin C (13mg) per 100gm of pulp. India is the largest producer of mango and occupying an area of 2516 thousand hectares with an annual production of 18431 thousand metric tonnes. It is extensively cultivated in Punjab, Haryana, Uttar Pradesh, Gujarat, Rajasthan, West Bengal, Maharashtra, Orissa, Andhra Pradesh, Karnataka and Tamil Nadu states of India. In Punjab, it is mainly growing in sub mountaineous zones with an area of 6744 hactares with 119322 metric tonnes production (PHB 2017-18).

2. PROBLEM BACKGROUND

Nursery potting medium is most important input for healthy, uniform and quality rootstock seedling production. Apart from the selection of proper ingredients, it is also necessary to maintain the porosity of the potting mixture so that proper development of roots takes place. Growing media is the important input for the containerized seedling production. It is characterized by light weight, friable, good water holding capacity, drainage, porosity and low bulk density etc. The production of planting stock of superior quality is the pre-requisite for plantation of an orchard. Therefore, the seedlings raised on good quality nursery media will ensure better establishment and growth when planted to the main field. The potting mixture should have enough nutrients, good water holding capacity and drainage to ensure better growth of seedlings. Now a days, there is necessity of reducing the production cost of planting stock by utilizing locally available material for raising quality nursery plants. Vermicompost is commonly used as plant growth media and soil amendments. Vermicompost is a product of a non-thermophilic bio-degradation of organic materials through interactions between earthworms and microorganisms. As compared to conventional compost, vermicompost have accelerated bio-oxidation of organic matter which is achieved mostly by high density earthworms populations and Vermicomposts are finely divided peat-like materials with high porosity, aeration, drainage and water holding capacity. Vermicompost significantly reduced bulk density and increased porosity of soils. Vermicompost can be used as a potting mixture for horticultural crops.

3. PROPOSED RESEARCH OBJECTIVE

The present study was conducted to ascertain the effect of growing media mixtures on seed germination and seedling growth of different mango (*Mangifera indica* L.) cultivars under submountaineous conditions of Punjab. Following are the objectives which are proposed in this research:

1. To examine the effect of different concentrations of growing media on seed germination mango.
2. To study the effect of different concentrations of growing media on seedling growth in mango.

4. REVIEW OF LITERATURE

Germination media played a vital role in seed germination, Said(1966) reported rapid germination of citrus seeds characterized with bench root in sphagnum when compared to sand medium .Mango seeds, on the other hand , showed best germination in leaf mould followed by sand, soil , sawdust and farmyard manure (Teaotia and Singh 1971).

The period needed for germination and the germination percentage of mango seeds c v . “Sensation” in different media varied between 14–29 days and 60 – 100% respectively , with best results obtained in sand + sawdust , topsoil , or sand + compost (Snyman, 1981) .

Gadalla .M .B (1993) found that the data of “kitchener” mango seed germination and germination percentages indicated no significant differences in seeds germination similar results were obtained by Teaotia and Singh (1971) and Snyman (1981) who found that The germination of mango seeds in sand , sand + sawdust and topsoil was about the same and only preceeded by leaf mould .

Leaf mould tested in a separate experiment for only one season indicates that there were no significant differences in germination of “kitchener” and Alphonso seeds when grown in sand leaf mould , river silt and river silt + sand combination; however , the latter three media had a profound effect on germination in comparison with sand . This is consistent with Chaudhri (1980) and Teaotia and Singh (1971) results which showed that inferior germination was obtained in sand , where as leaf mould resulted in highest germination percentages of mango seed . It was also clear that differences between cultivars were minimal.

Abed elatef . Nagla (2003) found that there was no Significant difference between Kitchener and Alphonso mango cultivars with respect to germination seed using different seed orientation except 35for seeds that were planted with their basal end facing downward. In this particular orientation the germination percentage of kitchener seeds were highly significant than that of Alphonso.

5. MATERIALS AND METHODOLOGY

The present study entitled “Effect Of Growing Media Mixtures On Seed Germination And Seedling Growth Of Different Mangoes(*Mangifera indica L.*)” will be conducted at V.P.O. Maheru, Tehsil Phagwara, District Kapurthala, Punjab under the Department of Horticulture, Lovely Professional University, Phagwara, Jalandhar, Punjab during the year 2018-19.

5.1 Materials required

Fully ripened mango fruits from healthy and disease free plants of Dusehri, Amrapali and Alphonso cultivar were collected and their stones were extracted and sown in the month of August in polythene bags (40cmx25cm size and 150-200gauge thickness).

5.2 Materials required

1. Plant cultivar: Dusehri, Amrapali and Alphonso
2. Media used – Soil, FYM, Sand, Vermicompost
3. Number of Treatments - 9
4. Number of Replications - 3
5. Total number of Plants - 27
6. Design Randomized Block Design (RBD)

5.3 Proposed Treatments:

- T1 Soil+ Sand+ Farmyard manure (FYM) (1:1:1)
- T2 Soil + Sand + Vermicompost (1:1:1)
- T3 Soil + Sand + FYM (2:1:1)
- T4 Soil + Sand + Vermicompost (2:1:1)
- T5 Soil+ Sand + FYM (1:2:1)
- T6 Soil + Sand + Vermicompost (1:2:1)
- T7 Soil + Sand + FYM (1:1:2)
- T8 Soil + Sand + Vermicompost (1:1:2)
- T9 Soil (control)

6. OBSERVATIONS TO BE RECORDED

1. Seed germination
2. Germination percentage
3. Survival percentage
4. Seedling height (cm)
5. Number of leaves
6. Seedling girth (mm)
7. Number of roots
8. Tap root length (cm)
9. Root girth (mm)
10. Fresh weight of seedling (gm)
11. Dry weight of seedling (gm)
12. Root fresh weight (gm)
13. Root dry weight (gm)

7. PROPOSED EXPECTED OUCTOME

Nursery potting medium is most important input for healthy, uniform and quality rootstock seedling production. Growing media is the important input for the containerized seedling production. It is characterized by light weight, friable, good water holding capacity, drainage, porosity and low bulk density etc. From this experiment we expect that by giving different concentrations of media to the seeds of mango cultivars, their germination percentage and growth of seedlings will be better in every aspect.

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