

## **RESEARCH PROGRAMME**

**Standardization of optimum time and condition for Wedge and Omega grafting of guava in Doaba region of Punjab.**

### **DISSERTATION REPORT- 1**

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

*In partial fulfillment of the requirements for the award of degree of*

**MASTER OF SCIENCE  
IN  
(HORTICULTURE)  
BY**

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## CERTIFICATE

This is to certify that synopsis titled “Standardization of optimum time and condition for Wedge and Omega grafting of guava in Doaba region of Punjab” 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 **Maninder deep (Registration No. 11719580)** under my supervision and that no part of this synopsis has been submitted for any other degree or diploma.

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## **Introduction**

Guava (*Psidium guajava* L.) belongs to family Myrtaceae, native to tropical America, it also known as the apple of the tropics, is one of the most common fruits in India. It claims to be the fourth most important fruit in area and production after mango, banana and citrus. It covers around 3.3% of the total area under fruit crops and contributes 3.3 % of the total fruit production in India (Anon). In India, Uttar Pradesh leads in production, while Allahabad region of U. P. produces best quality of guava in India as well as in the world. **Guava** is an important fruit crop of Punjab and ranks third after citrus and mango. It occupies an area of 8183 hectares with an annual production of 155526 tonnes. It is highly nutritious fruit and constitutes vitamin C from 150-200 mg/100 g of pulp. Guava fruit consists of antioxidants and is helps to maintain the systolic blood pressure. It is good source of dietary fibre and pectin. It can be processed into a various number of products like jelly ,nectar, juice, jam, juice, cake and puree etc. Its roots, bark, leaves and fruits has great medicinal value.It has great demand as a table fruit and raw material for the processing industries, and to earn good foreign exchange. Being very hardly, it gives an assured crop even with very little care. Its cost of production is also low because its requirements for fertilizer, irrigation and plant protection are comparatively low. Therefore, it is an ideal fruit for high yield, nutritional security and economic boost as well as.

Guava is successfully grown under tropical and sub-tropical climatic conditions owing to its wider adaptability. Being a hardy fruit plant, it can be grown in poor, alkaline and ill drained soils. Preferably it should be grown on soils with pH ranging from 6.5 to 7.5, however, it can withstand soil pH upto 8.7. For successful cultivation, the soils for guava should be deep, well-drained, friable, sandy loam to clay loam.

## **Problem Background**

Guava is commercially propagated by seeds. Sexual propagation does not produce true to type plants as it shows great variation due to unpreventable heterozygosity. Vegetatively it is propagated by Air layering , Wedge grafting, Omega grafting, root cutting, Stooling. Vegetatively propagated plants bears earlier than the sexually propagated plants. Healthy planting material is required for optimum growth and development in plants. These propagation techniques have been tried with varying success rate to increase productivity and gains done by clonal propagation and selection. Wedge grafting, Air layering and omega grafting is practiced as it has assured to produce true to type plants.

Omega grafting is done with the help of a specific grafting guillotine tool which is beneficial in formation of omega type shape in the scion and rootstock of the plant. This tool is having a structure and incision like omega which provides the significant shape to the scion and rootstock in desired type of grafting. It helps in serving the purpose of all type of grafting such as wedge grafting, veneer grafting, tongue grafting etc. Major advantage of this tool is that it saves time and labour.

Wedge grafting plays an important role particularly in multiplication of guava plants rapidly throughout the year either in polyhouse or in open field conditions in varied climatic conditions of Punjab and guava plants are required throughout the year. For proper growth and development of grafted plant suitable and growing season and their interaction with wedge grafting of guava to ensure availability of superior planting material for guava for large commercial scale of cultivation.

## **Review of Literature**

Visen et al. (2010) initiated wedge grafting which was completed in September month. It took less no of days for graft sprouting (13 days) under protected condition with respect to to grafting done in October month under open farm condition (27 days).

Mir and Kumar (2011) recorded that the wedge grafting completed on 4th week of February consumed less no of days (27.66) for graft sprouting as compared to grafting completed on 4th week of September (29.00 days) in walnut

Mulla et al. (2011) initiated that the softwood grafting completed in January month took less no of days for sprouting graft (16.60 days) as compared to grafting completed in the March month(28.75 days) under controlled conditions in jamun.

Angadi and Karadi (2012) described that the softwood grafting completed in the June month took less no of days for graft sprouting (16.67 days) than grafting done in December month (20.43 days) under poly mist house condition in jamun.

Syamal et al. (2012) described that the wedge grafting completed in August month took less no of days (9.03) for graft sprouting under protected condition than grafting completed in October month (14.97 days) under open field condition in guava.

Abbas et al. (2013) revealed that cleft grafting completed in January month took fewer no of days for graft sprouting (26.80 days) when compared to grafting completed in September month (46.50 days) under protective condition in guava.

Beer et al. (2013) described that the wedge grafting completed on 15th April under controlled condition took less no of days for graft sprouting (13.62 days) than grafting on 15th December in open field condition (46.90 days) in guava.

Joshi et al. (2014) organized an experiment to examine the comparative efficacy of various propagation techniques in guava and revealed that the combination of treatments of local guava root stock + wedge grafting with poly cap in poly house condition during February month took less number of days regarding sprouting (9.17 days ) than open conditions.

### **Proposed Research Objectives**

1. To study the optimum time of grafted plant in guava.
2. To study the suitable condition for wedge and omega grafting.
3. To identify significant methods of grafting.

### **Proposed Research Methodology**

**Study Site:** This experiment will be conducted in agricultural farm of Lovely Professional University during session of 2018 – 19 in Doaba region of punjab which lies under tropical and subtropical belt.

#### **NAME OF VARIETY(SCION):**

Scion Shoots will be attained from the shoot of 1 to 2 year old plant of Allahabad Safeda and L 49.

#### **Name of Rootstock:**

Rootstock seedling is to be selected as a rootstock for grafting.

## **Methods Of Grafting:**

Two methods of grafting are selected.

1. Wedge Grafting
2. Omega grafting

## **Date of Grafting:**

Date of Grafting will be initiated from 1st june to completed upto 31st of august.

D1 - 1st june

D2 - 15th june

D3 - 1st july

D4 - 15th july

D5 - 1st august

D6 - 15th august to 31st august.

The experiment will be organized to check out the best month out of 3 months for wedge and omega grafting of guava. June, July and August are selected and grafting will be done in 15 days interval. Wedge grafting will be done in august in terms time taken for sprouting, grafting percentage, No of leaves per new shoots, height of graft, girth of graft, graft survival percentage.

## **Conditions of Grafting:**

1. Number of replications - 3.
2. Number of Grafted plants in each replication - 5 to 10

## **Observation To be Recorded:**

1. Internodal length(cm)
2. Girth size(cm)
3. Number of shoots
4. Number of leaves on new shoots
5. Girth of Graft(cm)
6. Height of Graft(cm)
7. Graft survival percentage.
8. Number of days for sprouting
9. Height of plant(cm)

## **Expected Research Outcomes**

- 1..We will be able to find out about the optimum time of grafting method in guava during rainy season.
- 2.We will be able to know the appropriate and suitable conditions for wedge and omega grafting.
- 3.We will be able to identify the best & easy methods of grafting with respect to its success percentage.



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