To Study the suitable period of wedge grafting in guava under different condition of Chitrakoot Region

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Abstract: Guava (Psidum guajava L.) is one of the most promising fruit crops of India and is considered to be one of the exquisite nutritionally valuable and remunerative crops. In recent years, guava is getting popularity in the international trade due to its nutritional value and processed products. The scenario is changing from traditional propagation with incorporation of science and technology in nursery management and trade. Proper care is not exercised in the selection of scion material from really outstanding and disease-free mother plant. These trees become a permanent liability to the growers as no amount of wedge grafting, fertilization and care can change their genetic qualities. Wedge grafting has a tremendous potential for multiplying guava plants rapidly throughout the year either in green house as well as in open field conditions. In this paper to study the suitable period of wedge grafting in guava under different condition of Chitrakoot Region in India. The most suitable period for wedge grafting obtained at poly house condition from 20th November to 5th January and in open field condition most suitable period obtained from 5th January to 5th February at Chitrakoot region.

Keywords: Wedge grafting, guava, open & poly house condition.

I. Introduction

Guava (Psidum guajava L.) family Myrtaceae guava is one of the most promising fruit crop of India and is considered to be one of the exquisite nutritionally valuable and remunerative crops (Singh et al. 2000). Flower the area, production and productivity in India were estimated to be 1.55 lakh ha, 17.93 million tones and 11.56 t/ha respectively (Indian Horticulture Base 2012-13). In M.P. the area of Guava was obtained 2763 ha, production 55,260 tones and productivity 20 t/ha (commissioner, land record M.P. 2012-13). In recent years, guava is getting popularity in the international trade due to its nutritional value and processed products (Singh et al., 2005). However, the greatest handicap in guava plantation is indiscriminate multiplication of plants from unreliable sources by nurserymen (Singh et al., 2005). Proper care is not exercised in the selection of scion material from really outstanding and disease-free mother plant. The result is that large number of low grade guava plants are distributed and planted in the field every year. These trees become a permanent liability to the growers as no amount of wedge grafting, fertilization and care can change their genetic qualities. Non-availability of quality of planting materials and consequent substation of poor quality seedling has adversely affected the guava production and productivity levels. Although a large number of nurseries have been established there is an acute shortage of quality planting materials. The scenario is changing from traditional propagation with incorporation of science and technology in nursery management and trade (Singh and Bajpai, 2003).

There is tremendous scope for bringing substantial additional area under guava crop in India. So rapid and successful propagation technique is required as the area under crop is expanding and there is a demand to prepare the guava sampling throughout the year raising planting material through rapid multiplication technique. Guava plants have been propagated through seeds for a long time. Propagation from seeds results in considerable variation in the size shape and quality of fruits. Vegetative propagation in guava results in true-to-type crop with short juvenile phase. Though guava propagated through budding (Gupta and Malhotra 1985; Kaundal et al. 1987, air layering (Singh and Singh 1970), Sharma et al., 1978; Manna et al., 2004, stocking (Rathore, 1984, Pathak and Saroj, 1988) and inarching (Mukherjee and Majumder, 1983).

These are still not commercially viable due to varying rate of success absence of tap root system and cumbersome process. Therefore, there is need to produce healthy planting material of important commercial varieties. While choosing a particular technique for propagating guava, time of grafting operation and climatic conditions should be taken into consideration. Now Government of India has given focused attention on establishing the model nurseries for full-filling the requirements genuine planting material to the Indian farmers.
under National Horticulture Mission (N.H.M.). Therefore, a technique of rapid multiplication (wedge grafting) has been developed at Central Institute of Sub-tropical Horticulture (CISH), Lucknow (U.P.). Wedge grafting has a tremendous potential for multiplying guava plants rapidly throughout the year either in green house as well as in open field conditions. In view of varied climatic conditions of our country, guava plants are required round the year; presently the institute is producing raising quality materials of guava through wedge grafting technique round the year in green house as well as in open field conditions.

II. Materials and Methods

Study site
The study was conducted in Agricultural Farm Razaula at M.G.C.G.V. Chitrakoot (M.P.) in India during the session of 2012-13. The region of Chitrakoot comes under sub-tropical belt in the North-east part of Madhya Pradesh, which experiences extremely hot summer and fairly cold winter. During the winter months (December-February) temperature falls 5°C-8°C or even low, while in summer months (May-June) it reaches as high as 45°C- 47°C. The experiment was laid out in Allahabad Safeda variety of Guava.

Raising of rootstock seedling
Guava seeds were sown in nursery bed, after germination when seedlings near 3-4 foliage then the seedling were shifted in poly bag (12 x 25 cm) with potting mixture (3:1:1) proportion. The seedling was used for propagation after age 6 to 8 month old.

Preparation of scion stick
Shoot with growing optical portion (apical growth) which is 3 to 4 months old is selected for wedge grafting selected scion shoots are defoliated on the mother plant, about 6-8 days prior to detaching. At the same time, the apical growing portion of selected shoot also beheaded. This helps in forcing the dormant bud to swell. In this way the bud on the scion will be ready to start sprouting at the time of grafting this treatment is essential for high success of grafts.

Data collection and statistical analyses
The age of scion, height of root stock plant, grafting height of root stock, diameter of rootstock and other growth character was recorded on the day of grafting. Data on daily temperature, humidity, solar radiation and rainfall were recorded in each month. The experiment carried out Factorial Randomized Block Design with 8 treatments (different date of grafting), two factors (polyhouse & open condition) and analyzed by using software like MS-EXCEL and Statistical Analysis System (SAS).

Graft survival (%)
Calculate survival percentage of grafted plants having sprouted bud was counted after 15 days from date of grafting was counted and percentage of graft survival was calculated by the following formula:

\[
\text{Graft survival (%) } = \frac{\text{Total number of survival grafts}}{\text{Total number of grafted plants}} \times 100
\]

III. Results & Discussion
The data on graft survival percentage presented in Table 1 showed that various dates of grafting at poly house condition and open field condition both were significant. The graft survival percentage of grafted plant varies, maximum graft survival percentage in P.H.C. was obtained (93.08%) at the month of 5th January which was at par with the (90.94%) in the month of 20th November and in O.F.C. was obtained (76.33%) at the month of 20th January which was at par with the (72.69%) in the month of 20th February minimum graft survival percentage were obtained in P.H.C. was (80.69%) at the month of 5th March and in O.F.C. was (46.33%) at the month of 20th November.

Table 1: Effect of graft survival percentage in poly house condition and open field condition different dates of grafting.

<table>
<thead>
<tr>
<th>Date of grafting D</th>
<th>Levels of Field condition</th>
<th>Interaction (C x D)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Polyhouse condition (C1)</td>
<td>Opened field condition (C2)</td>
</tr>
<tr>
<td>20th November</td>
<td>90.94</td>
<td>46.33</td>
</tr>
<tr>
<td>5th December</td>
<td>90.47</td>
<td>57.43</td>
</tr>
<tr>
<td>20th December</td>
<td>89.37</td>
<td>69.79</td>
</tr>
<tr>
<td>5th January</td>
<td>93.08</td>
<td>72.69</td>
</tr>
<tr>
<td>20th January</td>
<td>87.39</td>
<td>76.33</td>
</tr>
<tr>
<td>5th February</td>
<td>86.66</td>
<td>72.62</td>
</tr>
<tr>
<td>20th February</td>
<td>86.15</td>
<td>69.20</td>
</tr>
</tbody>
</table>
The similar trend was observed in interaction between P.H.C. and O.F.C. was significant. Maximum graft survival percentage was obtained (82.89) for the month of 5th January which was at percentage the (81.86) in the month of 20th January and minimum graft survival percentage was obtained (68.64) for the month of 20th November.

**IV. Conclusion**

The most suitable period for wedge grafting at poly house condition from 20th November to 5th January and in open field condition most suitable period was obtained from 5th January to 5th February at Chitrakoot region in India. The maximum percentage of graft survival obtained at poly house condition was (94.08 %) in the month of December and open field condition was (77.33%) in the month of January. The wedge grafting given best performance under poly house (protected) condition obtained in the month of December and open field condition the best performance was obtained in the month of January.

**References**


