



STANDARDIZATION OF OPTIMUM BUDDING TIME FOR PEACH NURSERY UNDER SOON VALLEY CONDITIONS

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ABSTRACT

A study was conducted at Horticultural Research Station, Nowshera (Soon Valley), Khushab, Pakistan during 2014-15. Scion buds of Earligrande variety of peach were budded on 20th May, 30th May, 9th June, 19th June, 1st July, 11th July, 21st July and 31st July by "T-budding" on wild peach rootstock. Higher sprouting percentages were observed in plants budded on 30th May (90.50%), 9th June (89.00%) and 19th June (93.00 %). Maximum success of sprouted buds on scions (78.21%) and plant height (134.4 cm) was recorded in plants budded on 31st July. Maximum plant height (138.4 cm) was noted in plants budded on 30th May. Minimum success (51.50%) was noted in nursery budded on 20th May, while the lowest plant height (88.82 cm) was recorded in plants budded on 31st July. Successful commercial nursery production of peach may be possible by utilization of budding season from 30th May to end June for robust nursery plants.

KEYWORDS: *Prunus persica*; peach; nursery; budding; sprouting; plant height; Pakistan.

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INTRODUCTION

Peach (*Prunus persica*) is a member of Rosaceae family and its origin is believed to be China where it was cultivated about 2000 B.C before it was taken westward to Persia and later to Greece about 350 B.C. (Hartman, 1976). Peach is common fruit crop of sub-mountainous areas of Pakistan, but due to its wide range of adaptability it is being grown in plain areas of the upper Punjab. High budding success percentage and maximum plant size are vital considerations for commercial nursery production of peach plants. Optimum budding time of peach nursery is very important for production of nursery saplings with maximum plant height and budding success.

Generally peach nursery is budded from end June to end August in different areas of Pakistan. Nursery plants produced in the said budding season remain smaller in size and poor in health during the budding year due to short growing period. Moreover, sale of one year old nursery plants is not encouraged at optimum price and nursery growers cannot get good price.

Budding and grafting techniques are usually employed in cultivars which are difficult to propagate via sexual reproduction or other vegetative methods and where desirable characteristics of some of rootstocks are to be used (Kako *et al.*, 2012). The best time for budding for deciduous fruits like plums, apricots and peaches is mid- August (Ahmad *et al.*, 2012., Sharif *et al.* 2015). Mehmet and Çekiç (2011) have stated that budding time and rootstocks have a significant

effect on the success rate of black mulberry budding. Budding compatibility is significantly influenced by time of budding, climatic and environmental conditions of the region (Barylá and Kaplan, 2012). Success of bud grafting is greatly dependant on the quality of rootstocks (Barylá and Kaplan, 2012; Barylá *et al.*, 2013; Abbas *et al.*, 2013). Early budding of cherry results in production of high quality nursery and the best time for budding is in August (Maryam *et al.*, 2015). In sweet and sour cherries the best time for budding was late August to early September, while mid-August for plums, apricots and peaches (Vasilenko, 1991). Budding on 25th June gave only 32.6-36.7% success in cherries and zero in other species. Peach cultivars Lola and Sumbuli, T-budded on the seedlings in late May to early June, grew well (Rudikova, , 1987). Budding in peach is practiced in active growing season. The time of budding is different in different species and even varieties for healthy plants of suitable height (Imran *et al.*, 2012). Barylá and Kaplan (2012) observed that the budding of Mahaleb cherry performed on 1st and 15th August had a more beneficial effect on the growth and branching of trees than budding done on 15th July and 1st September. Success of bud union and plant health is mostly dependent on budding time of rootstock in apricot and peach (Akhtar, *et al.*, 2000). Sohail *et al.*, (2015) recommended that T-budding on 31st July is the best for better growth of Guava nursery plants.

The present study was planned to find out the optimum budding time of peach nursery for production of

good quality saplings with maximum plant height and budding success.

MATERIALS AND METHODS

This study was conducted at Horticultural Research Station, Nowshera (Soon Valley), Khushab, Pakistan during the year 2014-15. Stones of wild peach commonly referred to as “Desi peach” were sown during the last week of October for raising of rootstock nursery. Selected rootstock saplings were budded with Earligrande variety of peach on uniform sized rootstock at height of ten cm from soil level by “T-budding”. Twenty buds per treatment were used and replicated four times thus total 640 buds were used for eight different budding times (20th May, 30th May, 9th June, 19th June, 1st July, 11th July, 21st July and 31st July). The experiment was carried out in RCBD with one factor (budding time interval). There were eight treatments in each replication.

Sprouting percentage

The sprouted buds in each treatment were counted 30 days after budding and sprouting percentage of bud was calculated with the following formula:

$$\text{Bud sprouting percentage} = \frac{\text{Sprouted buds}}{\text{Total buds inserted}} \times 100$$

Success percentage

The sprouted buds were counted after 60 days after budding and the success percentage was calculated by using the following formula:

$$\text{Success percentage} = \frac{\text{Total sprouted buds}}{\text{Total buds taken}} \times 100$$

Plant height (cm)

Height of plants was measured using a measuring tape. One end of the measuring tape was placed on the budded portion and the other was extended to top of the shoot in order to get actual length. The mean of the 20 plants was recorded during each experimental year and mean was calculated from the data recorded for the said period.

Statistical analysis

All the data noted on plant growth parameters were subjected to analysis of variance (ANOVA). The data were analyzed statistically using Mstat-C program. The means were compared using the LSD test at 5% level of significance (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Sprouting percentage

The data for the sprouting percentage (Fig. 1) revealed that budding done during 30th May upto 19th June (90.50, 89.00 and 93.00 % respectively) was highly significant and remained at par with each other. The next best date was 1st July (84.50 %). Budding done on all other dates had lower sprouting percentage as compared to rest of the treatments. Minimum sprouting (69.50%) was obtained by the plants budded on 31st July. Higher sprouting success in above three treatments might be due to the fact that cell sap in rootstock and scion was active during this period. Proper temperature and humidity could also facilitate the union between stock and scion. Climates of the area also supports the bud union development. Similar results have been reported by Imran (2012) and Rudikova (1987).

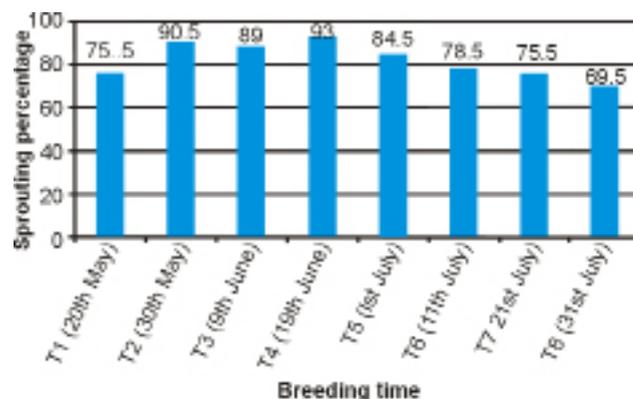


Fig. 1. Effect of budding time on sprouting percentage.

Success percentage

The data recorded for success percentage (Fig. 2) depicted that budding done during 30th May to 19th June (78.21, 76.12, 74.16 % respectively) had highly significant effect on success percentage as compared to rest of the treatments. These results are in line with Gautam et al. (1991) who reported the highest bud sprouting (65%) while practicing T-budding of peach on local peach root stocks on 25th July.

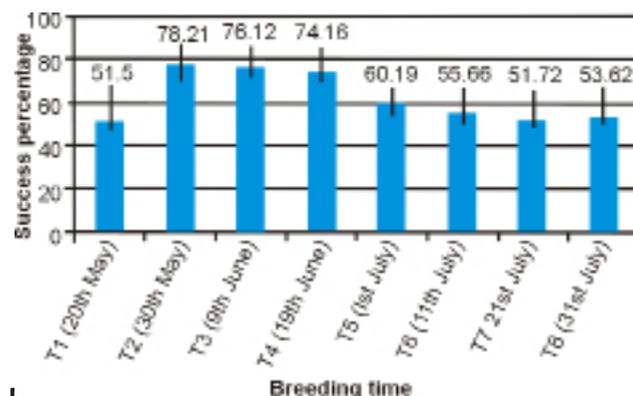


Fig. 2. Effect of budding time on success percentage.

The data (Fig. 3) show that plants budded from mid May to early June (20th May, 30th May and 9th June) had maximum plant height i.e. 135.8, 138.4 and 130.6 cm. These three treatments were at par with each other and differed significantly from rest of the treatments. Minimum plant height (88.82 cm) was recorded in 31st July budding date. This may be due to the fact that plants budded earlier had more active growing season. Rudikova (1987), Akhtar, *et al.* (2000) and Imran *et al.* (2012) have also stated that early budding had more beneficial effect on plant health.

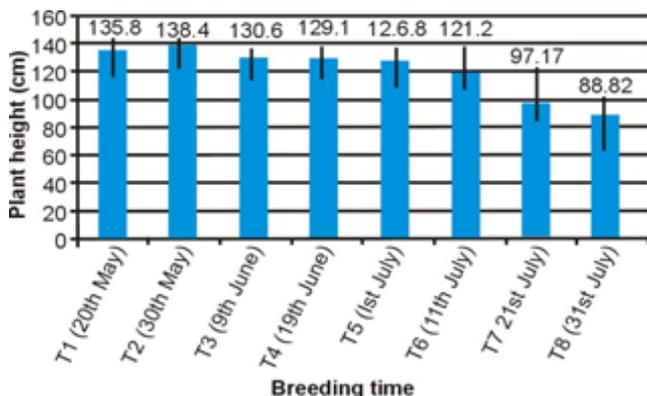


Fig. 3. Effect of budding time on plant height.

CONCLUSION

A programmatic recommendation may be given in the light of these studies that commercial nursery growers of peach can produce healthy nursery saplings which are economically saleable annually. They may use budding season from mid May to end of June for production of healthy nursery plants.

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3.	Muhammad Ashraf Sumrah	Assisted in write-up	