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Standardization of Optimum Budding Time for Peach Nursery in Soan Valley

Muhammad Ashraf Sumrah*[1], Attiq Akhtar[1], Allah Bakhsh[1] and Malik Mohsin Abbas[2]
[1]Horticultural Research Station, Nowshera (Soon Valley), District Khushab
[2]Horticultural Research Institute, Ayub Agricultural Research Institute, Faisalabad
Emails: ashrafsumrah@gmail.com (M.A.S), attiqakhtar@gmail.com (A.A), allahbakhsh64@gmail.com (A.B), malikmohsin144@gmail.com (M.A)

Abstract

High success percentage and maximum plant size is a core requirement of 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. 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 respectively by "T-budding" on wild peach rootstock. Maximum sprouting percentage was observed in plants budded on 30th May, 9th June and 19th June (90.50, 89.0 and 93.0% respectively). Budding success (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 budding success (51.50%) was noted in nursery budded on 20th May, while lowest plant height was lowest (88.82 cm) in case of 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.

INTRODUCTION

Peach (*Prunus persica*) is a member of Rosaceae family and its origin is believed to be China where it was cultivated about 2,000 B.C before it was taken West 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 adoptability it is being grown in plain areas of the upper Punjab. High budding success percentage and maximum plant size is a core requirement of 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 are techniques usually employed in cultivars which are difficult to propagate via sexual reproduction or other vegetative methods and where desirable characteristics of some of the rootstocks are to be used (*kako et al.,* 2012). The best time for budding for deciduous fruits like plum, apricots and peaches is mid-August (Ahmad *et al.*, 2012). Mehmet and Çekiç (2011) has 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 (Baryla and Kaplan, 2012.) Success of bud grafting is greatly dependant on the quality of rootstocks (*Baryla and Kaplan*, 2012; *Baryla 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 nil 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 the 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). Baryła and Kapłan (2012) observed that the budding of mahaleb cherry performed on the two August dates (1st and 15th) had a more beneficial effect on the growth and branching of trees than the budding done on 15 July and 1 September. Success of bud union and plant health is mostly dependent on budding time of the 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.

These studies were conducted at Horticultural Research Station, Nowshera (Soon Valley), District Khushab, situated in semi hilly area during 2013 – 2014. The objective of the study was to find out early initiation of nursery budding and elongation of growth period of budded peach nursery so that taller and healthy plants may be produced by utilization of active growth season. Sale of one-year old nursery plants at optimum rate may be possible due to production of healthy nursery plants for economic use of nursery growers' resources.

MATERIALS AND METHODS

Stones of wild 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 10 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 i.e. (20th May, 30th May, 9th June, 19th June, 1st July, 11th July, 21st July and 31st July). The experiment was carried out in Randomized Complete Block Design (RCBD) with one factor (budding time interval). There were eight treatments with four replications. To calculate bud sprouting percentage, the sprouted buds in each treatment were counted 30 days after budding and sprouting percentage of bud was calculated as dividing total sprouted buds/total buds inserted x 100. The sprouted buds were counted again 60 days after budding and the success percentage was calculated as total sprouted buds/ total buds taken x 100. 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 the top of the shoot to get actual length. The mean of the twenty plants was recorded during each experimental year and mean was

calculated from the data recorded for the said period. All the data noted on plant growth parameters was subjected to analysis of variance (ANOVA). The data were analyzed statistically using MstatC 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 recorded for the sprouting percentage is presented in figure 1, revealing that budding done during 30th May upto 19th June (90.50, 89.0 and 93.0% 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 success percentage as compared to rest of the treatments. The least sprouting percentage (69.50%) were obtained by the plants budded on 31stJuly. This might be because cell sap in root stock and scion is active during this period. Proper temperature and humidity could also facilitate the union between stock and scion. Climatic facts of the area also support the bud union development. Similar results have been reported by Imran (2012) and Rudikova (1987).

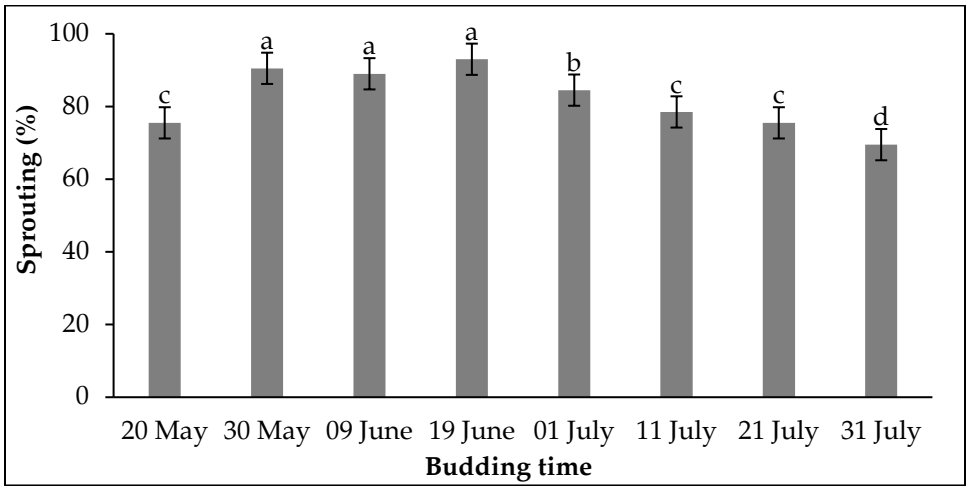

Figure 1: Effect of budding time on sprouting percentage. T_1 - 20th May; T_2 – 30th May; T_3 – 9th June; T_4 - 19th June; T_5 - 1st July; T_6 - 11th July; T_7 – 21st July; T_8 – 31st July. LSD = 4.30.

Success Percentage

The data recorded for success percentage is presented in figure 1, depicting 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 burst (65%) while practicing T-budding of peach on local peach root stocks on 25th July.

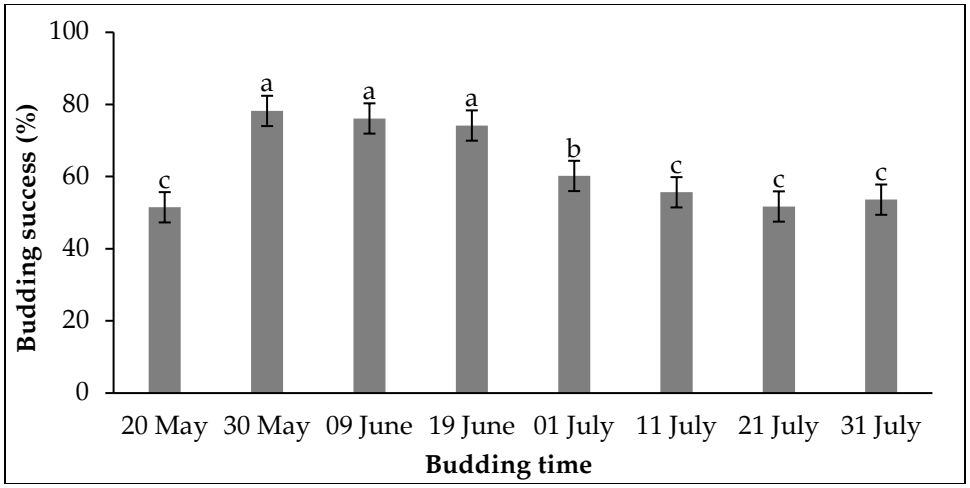

Figure 2: Effect of budding time on budding success percentage. T_1 - 20th May; T_2 – 30th May; T_3 – 9th June; T_4 - 19th June; T_5 - 1st July; T_6 - 11th July; T_7 – 21st July; T_8 – 31st July. LDS = 4.20.

Plant Height

The data regarding plant height in figure 3 shows that plants budded from mid May to Early June (T_1, T_2 and T_3) had maximum plant height. These three treatments were at par with each other and differed significantly from rest of the treatments. Minumum plant height was recorded in T8. This may be because 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.

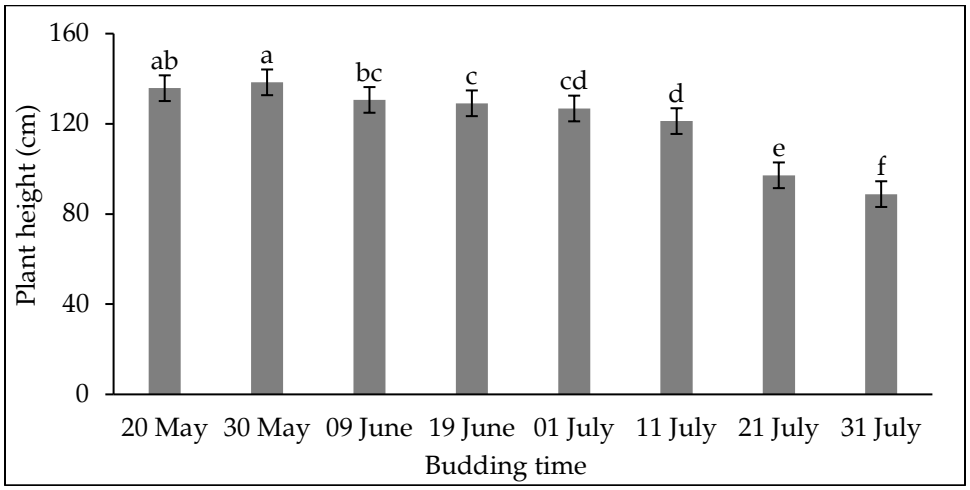

Figure 3: Effect of budding time on height of peach plants. T_1 - 20th May; T_2 – 30th May; T_3 – 9th June; T_4 - 19th June; T_5 - 1st July; T_6 - 11th July; T_7 – 21st July; T_8 – 31st July. LSD = 5.70.

CONCLUSION

A programmatic recommendation may be given in the light of these studies that commercial nursery growers of peach can produce healthly 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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