



Studies on Stenting Techniques in Plum (*Prunus salicina* Lindl.)

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ABSTRACT

Present investigations on the "Studies on stenting techniques in Plum (*Prunus Salicina* Lindl.)" were carried out on in the Fruit Research Farm of Agriculture college of Guru Kashi University, Talwandi Sabo during the year 2017-18. Long hardwood cuttings (15-20 cm) of plum rootstock Kala Amritsari were taken from 6 year old trees on December, 2017. These cuttings were tongue grafted with scions of Satluj Purple having 3-4 buds. After grafting, the 3/4 cm basal portion of the grafts were treated with different concentrations of IBA @ 100, 200 (24 hr soaking), 1000, 1500, and 2000 ppm (2 minutes dip) and were planted in the field. The best date of planting for Sprouting was 22nd January, 2018 with the highest sprouting success (56.12%) and the highest success of unsuccessful stents after T-Budding (56.14%) during August, 2018. Among the treatments grafts planted after 2000 ppm IBA had exhibited significantly higher sprouting success (75.75%) and the highest success of unsuccessful stents after T-Budding (75.41%) during August, 2018. The vegetative growth (plant height and number of leaves) of the grafts were also found to be higher in 2000 ppm and 1500 ppm IBA than other treatments. From the above facts in the plum stents of Kala Amritsari rootstock after treating with higher doses of IBA (2000, 1500 ppm) and can be inferred that planted during 3rd week of January, can be exploited commercially.

Key words: Plum, IBA, Kala Amritsari, Grafting, Sprouting

Plum is the most vital fruit crop grown commercially after apple and pear in temperate zone of the world. Two clearly dominant groups of plum are the European plum (*Prunus domestica* Linn.) and the Japanese plum (*Prunus salicina* Lindl.). It belongs to the family Rosaceae and sub family Prunoideae. It is referred as 'stone fruit' because of its hard endocarp. The Japanese group has low chilling requirement and adapted to warm winter regions of the world. Besides being cultivated in the temperate climate in the hills, it is also cultivated in the north Indian plains (subtropical climate) in the states of Punjab, Haryana, Rajasthan and Uttar Pradesh with the introduction of low chilled peaches. In Punjab, it is grown in an area of 1716

hectares with production of 30340 metric tonnes annually (Anonymous 2017). In Punjab, it is grown on an area of 234 ha with yearly production of 4169 MT (2016-17). It's cultivation is mainly concentrated in Shaheed Bhagat Singh Nagar, Patiala, Ludhiana and Gurdaspur districts. The area under plum cultivation is picking up rapidly due to higher returns on unit area basis and availability of suitable cultivars and their production technology. Plum is planted either in solid blocks at 6m x 6m distance or as a filler trees in mango, litchi and pear orchards during the first fortnight of January. The plants of Kala Amritsari are also transplanted in the orchard of Satluj Purple as pollinizer in the ratio of 25:85 plants/acre. (Package of Practices for

cultivation of Fruits 2017). The Auxin concentrations especially indole butyric acid (IBA) vary with the type of cuttings used (Couvillon 1980). Stenting is a method of rapid multiplication of plants (Van-De-Pol and Breukelaar 1982). Stenting has become an important method of fast multiplication in apple, plum and pear (Hartman *et al.* 2002).

MATERIALS AND METHODS

The present study was conducted at the Research Farm of Agriculture college of Guru Kashi University, Talwandi Sabo during the year 2017-18. From the experiment 15-20 cm long hardwood cuttings of plum rootstock Kala Amritsari were taken from 6 year old trees on December, 2017. These cuttings were tongue grafted with scions of Satluj Purple having 3-4 buds. After grafting, the 3/4 cm basal portion of the grafts were treated with different concentrations of IBA @ 100, 200 (24 hr soaking), 1000, 1500 and 2000 ppm (2 minutes dip) and were planted with two dates of planting (12th January and 22th January) in the field. After these treatments, hardwood cuttings were planted at a distance of 15 cm in rows, which are kept 30 cm apart in the well prepared nursery plots by following the recommended package of practices used for proper care of nursery plants. The data on sprouting success and different vegetative growth parameters was recorded and analyzed with split plot design by Fisher (1935).

RESULTS AND DISCUSSION

Table 1 Effect of the date of planting on sprouting success, completion of sprouting, plant height, number of leaves and success of unsuccessful stents after T-budding (%)

Date of planting	Sprouting success (%)	Height of plants (cm)	No. of leaves	Completion of sprouting	Success of unsuccessful stents after T-budding (%)
12-Jan	54.83	50.58	34.2	7-8	55.1
22-Jan	56.12	53.21	36	7-8	56.1
CD at 5%	0.58	1.4	1.91	-	1.7

Plant height

The data showed that the mean grafts height during was the maximum (53.21 cm) when the grafts were planted on 22nd January, 2018 and it was significantly higher than those planted on 12th January, 2018 (50.58 cm). Among the treatments, the mean grafts height was the highest (87.5 cm) in IBA 2000 ppm, which was significantly higher than all the other treatments. The mean grafts height was the lowest (38.12 cm) in 100 ppm which was slightly better in 200 ppm (47.37 cm) treatment. Minhas *et al.* (1993) they found that the maximum plant Height was found in stents of Florida Sun as compared to Shan-i-Punjab With 100 ppm IBA. The results are also in agreement with Rehman *et al.* (2002) they observed that the hardwood cuttings of variety Corantina treated with 3000 ppm concentration of IBA resulted in maximum shoot growth as compared to the control. Negi and Upadhyay (2016) obtained maximum stenting height in sweet cherry and Baggugosha in 5000 ppm IBA application.

Sprouting percentage, completion of sprouting ,plant height, number of leaves, the success of unsuccessful stents after T-budding Kala Amritsari (*Prunus salicina* Lindl) plants were influenced by different levels of IBA concentrations.

Sprouting success

The data (Table 1) showed that sprouting was the maximum (56.12%) in the grafts planted on 22th January, 2018, and it was significantly higher than the plants sown on 12th January 2018 (54.83%). In (Table 2) among all the treatments the maximum mean sprouting (75.75%) was recorded in IBA 2000 ppm, planted on 22nd January, 2018. While, the minimum mean sprouting success (61.75%) was recorded in IBA 100 ppm. Noor *et al.* (1995) found that IBA 3000 ppm was the highest application for maximum sprouting in M26 and M27 apple rootstock cuttings.

Completion of sprouting

The data presented in (Table 1, 2) showed that the duration of sprouting in the treatments was 7-8 days on both the planting dates. Thus IBA treatments and planting dates had no effect on duration of sprouting. The results are in agreement with Dhillon (1987) in pear but contradictory to Srivastava (2004) they reported that in Kiwi earliest sprouting was completed when cuttings were treated with 5000 IBA and maximum number of days taken to sprout was observed in control. The minor difference in these reports might be due to the genetic makeup of different species/varieties and environmental factors.

Number of leaves

The mean numbers of leaves were the maximum (36.0) when the stents were planted on 2nd date (22nd January, 2018) and it was at par with those planted on 1st date (12th January, 2018). Among the treatments, IBA 2000 ppm recorded the maximum mean number of leaves (55.6) which was significantly higher than all the other treatments. The minimum number of leaves (31.2) were recorded in IBA 100 ppm. Alam *et al.* (2007) also noted that IBA enhanced the Per cent plant survival, number of roots per plant, root length, root weight, root diameter, number of leaves and shoot diameter in Kiwi cuttings.

The success of unsuccessful stents after T-budding

The data of effect of different treatments effects on the success of unsuccessful stents after T-budding taken in August are showed that the maximum T-budding success (56.1%) of unsuccessful grafts was recorded in the treatments which were planted on 22nd January, 2018 and

which was significantly higher than the budding success rate (55.1%) of 12th January, 2018. Pathak and Srivastava (1975) obtained 80 per cent of bud take and 60 to 70 per cent budding success during July to August. Among all the treatments the highest success (75.4%) T-budding of unsuccessful grafts was found in IBA 2000 ppm, which was significantly higher than all the other treatments. The next best treatment was the 1500 ppm where T-budding success of 67.7 per cent was recorded during the last week of August

2018. The least budding success (62.5%) was recorded in 100 ppm treatment after which was significantly less than 200 and 1000 ppm. On both planting dates (12th January and 22nd January 2018), the maximum budding success (75.0 % and 75.8%) was found in 2000 ppm. In all other treatments, the mean budding success was significantly higher than control. In the present study the highest success of T-budding in 2000 ppm treatment was probably found due to more girth and height of the grafts.

Table 2 Effect of different treatments of IBA on Sprouting success, completion of sprouting, plant height, number of leaves and success of unsuccessful stents after T-budding (%)

IBA doses	Sprouting success (%)	Height of plants (cm)	No. of leaves	Completion of sprouting	Success of unsuccessful stents after T-budding (%)
100 ppm	61.75	38.12	31.2	7	62.5
200 ppm	63.75	47.37	33.4	7	64.1
1000 ppm	63.75	64.62	40.9	8	64.1
1500 ppm	67.87	73.75	49.3	8	67.7
2000 ppm	75.75	87.5	55.6	7	75.4
CD at 5%	1.45	0.87	1.24	-	0.6

From the above results of data, it may be inferred that the simultaneous grafts of Satluj purple scion on Kala Amritsari rootstock can be propagated by stenting technique

planted during 3rd week of January and treated with 2000 ppm IBA solution for 2 minutes. This practice will cut short the period of propagation by a period of one year.

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