

Original Research Article

Effect of Different Levels of Pruning on Flowering and Yield of Mogra (*Jasminum sambac* L.) Cv. Bela

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ABSTRACT

The present investigation was carried on “Effect of different levels of pruning on flowering and yield of mogra (*Jasminum sambac* L.) Cv. Bela” at the Department of Horticulture, Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani during the year 2010-11. The experiment was laid out in simple randomized block design with four replications and six treatments. Four years old mogra plants of Cv. Bela was selected for investigation. In this investigation jasmine plants were pruned at different levels viz. T₁ pruning at 20 cm from ground level, T₂ pruning at 30 cm from ground level, T₃ pruning at 40 cm from ground level, T₄ pruning at 50 cm from ground level, T₅ pruning at 60 cm from ground level and T₆ control (no pruning). The effect of these treatments was noted on flowering and yield of mogra. (*Jasminum sambac* L). The pruning at 50 cm from ground level emerged significantly superior for flowering parameters like days to initiation of first flower (49.25 days), days to 50 per cent flowering (53.48), diameter of flower (4.4 cm) and yield parameters like weight of flower (21 g), number of flowers per plant (3838.85), yield of flowers per plant (806.19 g), yield of flowers per plot (16.12 kg) and yield of flowers per hectare (55.97 q/ha) in mogra. The next best treatment was pruning at 40 cm height from ground level in respect of yield of mogra. This might be due to the accelerated mobility of photosynthetic from the source to the sink as influenced by growth hormone released or synthesized due to higher plant growth.

Keywords

Pruning,
flowering,
Mogra, yield

Introduction

Mogra (Jasmine) is one of the most important commercial flower crop widely cultivated and esteemed for its attractive fragrant flowers. Among the important species of jasmine, *Jasminum sambac* is the most common, is also known as Arabian Jasmine. Jasmine oils are used extensively in the manufacture of cosmetics, soaps, confectionary perfumes, perfumed tobacco, syrups, aerated water, ointments, disinfectants and detergents. Flowers are used for making garland, hair adornments of

woman and for medicinal purpose. The fragrance of jasmine flower cannot be imitated by any one of the known synthetic aromatic chemicals (Bhattacharjee, 1980). Mogra is an evergreen plant Usually propagated by cutting and layering. Pruning is most important practice in jasmine that can enhance the health, vigour and aesthetics of mogra plant. Pruning makes the plant strong and build up a good frame work. It is important for maintenance of floriferousness and flower quality along

with vigour of jasmine plant. Pal and Bose, (1980) observed that plants of *J. sambac* cv. Khoya pruned at 40 cm height in January produced the highest yield. Singh and Moe (1980), on the other hand reported that, pruning to 75 cm height in mid-December resulted in the highest flower and concrete yield.

Materials and Methods

The experiment was carried out at Department of Horticulture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani during the year 2010-2011. The experiment was laid out in Randomized Block Design (RBD) with 6 treatments and 4 replications. Four year old Mogra plants of cv. Bela were selected for investigation, 24 individual plots with spacing 1.2 x 1.2 m size were demarcated in experimental field leaving 50 cm between two plots and 100 cm between two replications. Recommended dose of fertilizer for mogra is 100:50:50 kg NPK/ha. for the experiment a dose of 14:7:7 gm NPK/plant was applied. Nitrogen was applied in the form of Urea, Phosphorus through single super phosphate and Potash through muriate of potash. Treatment includes pruning of Mogra plants at different levels of height viz. 20 cm, 30 cm, 40 cm, 50 cm, 60 cm above the ground level and no pruning (control) by keeping uniform number of branches. Shoots were pruned with the help of secateur, half centimetre above the bud to prevent fungal infection, cut ends of the shoots were spread with fungicide solution. Dead infested weak criss-cross branches were pruned. Pruning of mogra plants was undertaken on 2nd January, 2011.

Results and Discussion

The results obtained in respect of flowering and yield parameters of mogra viz.,

initiation of first flower, days to 50 per cent flowering, diameter of flower, weight of flower, number of flowers per plant, yield of flowers per plant, yield of flowers per plot and yield of flowers per hectare revealed that there were significant effect of various levels of pruning.

Effect on initiation of first flower and days to 50 per cent flowering

The data in respect of average number of days required for appearance of first flower and days to 50 per cent flowering in various treatments are presented in Table-1. The treatment T₄ (49.25 days) produced significantly earlier initiation of flowering than all other treatments except T₃ (50.50 days) which was found to be statistically at par with each other. The treatment T₁ recorded late initiation of flowering (61.25 days) as compared to all other treatments. In case of 50 per cent flowering the treatment T₄ (53.48 days) required less number of days for 50 per cent flowering which was found significantly superior over all other treatments. The treatment T₁ (66.22 days) recorded late flowering as compared to other treatments.

Effect on diameter of fully opened flower and weight of 100 flowers

The data pertaining to the diameter of fully opened flower and weight of flower as affected by different levels of pruning are presented in Table 2. There were significant effects of various levels of pruning on increasing of diameter of flower. The treatment T₄ (4.4 cm) significantly increased the flower diameter than treatments T₁ and T₅. However treatments T₃ and T₂ were found statistically at par with treatment T₄. Lowest diameter of flower (2.9 cm) was recorded in treatment T₆ (Control). In case of weight of 100 fresh flowers the treatment

T₄ (21.00 gm) showed significantly more flower weight than all other treatments. However the treatments T₃ (20.35 gm) and T₂ (20.27 gm) were found at par with the treatment T₄. The minimum weight of flower was observed in treatment T₆ (16.95gm).

Effect on number of flowers per plant

The data pertaining to the mean number of flowers per plant as influenced by different height of pruning were presented in Table-3. The treatment T₄ (3838.85) produced significantly more number of flowers per plant than all other treatments. The treatment T₁ (3581.42) and T₂ (3607.99) were found statistically at par with treatment T₃ (3643.09). Less number of flowers per plant was recorded in treatment T₆ (1922.94).

Effect on yield of flowers

The data presented in Table-4 revealed that the treatments of various levels of pruning showed significant effects in respect of yield of flower per plant (gm), per plot (kg) and per hectare (q). Maximum yield per plant (806.19 gm), yield per plot (16.12 kg) and yield per hectare (55.97 q) was recorded in T₄, followed by T₃ (741.43 gm/ plant), (14.82 kg/plot) and (51.45 q/hectare). Minimum yield of flowers were recorded in control treatment T₆ (325.94 gm/plant), (6.51 kg/plot) and (22.63 q/hectare).

Days to initiation of first flower and 50 per cent flowering

The significant differences were observed in all treatments. The treatment T₄ required less number of days for initiation of first flower and for 50 per cent flowering and comparatively delayed flowering was observed in plants pruned at lower levels of

height. The present findings are in agreement with the findings of Uma and Gowda (1987) while studied in roses.

Diameter of fully opened flower and Weight of 100 fresh flower (gm)

Plants were pruned at 50 cm (T₄) from the ground level produced significantly large size flowers than other treatments followed by T₂ (40 cm) and T₁ (30 cm). The results are partially contractor with findings of Degetyer (1975) studied the pruning of glasshouse rose Cv. Baccara and Sonia observed the highest total shoot number and enhance flowering with the higher pruning height. Similar results also recorded by Mukhopadhyay *et al.*, (1987) supporting the present investigation.

The results in regards to weight of flower indicated the significant differences. When pruning was done 50 cm (T₄) from ground level produced superior weight of flower. The minimum weight of flower was observed in control. This is accordance with the findings of Nanjan *et al.*, (1974) revealed that when plants were pruned at light pruning the weight of flower increased respectively.

The higher flower weight in treatment T₄ might be due to the accelerated mobility of photosynthetic from the source to the sink as influenced by growth hormone released or synthesized due to higher plant growth.

Number of flowers per plant

The increased number of flowers per plant was observed in 50 cm height of pruning (T₄). The lowest number of flowers observed in control (T₆). It may be due to accumulation of cytokinin in the producing shoot and this could have caused increased number of flower per plant.

Table.1 Effect of different levels of pruning on days to initiation of first flower and days to 50 per cent flowering.

Treatment No.	Treatments Details	Mean days to initiation Of first flower	Mean days required to 50 per cent flowering
T ₁	Pruning at 20 cm	61.25	66.22
T ₂	Pruning at 30 cm	56.50	61.30
T ₃	Pruning at 40 cm	50.50	54.90
T ₄	Pruning at 50 cm	49.25	53.48
T ₅	Pruning at 60 cm	53.00	58.42
T ₆	Control	52.37	57.36
	SE ±	0.73	0.30
	CD at 5 %	2.21	1.00

Table.2 Effect of different levels of pruning on diameter of fully opened flower and weight of 100 flowers

Treatment No.	Treatments Details	Mean diameter of flower (cm)	Weight of 100 fresh flowers (g)
T ₁	Pruning at 20 cm	4.0	19.87
T ₂	Pruning at 30 cm	4.3	20.27
T ₃	Pruning at 40 cm	4.3	20.35
T ₄	Pruning at 50 cm	4.4	21.00
T ₅	Pruning at 60 cm	3.8	19.77
T ₆	Control	2.9	16.95
	SE ±	0.074	0.29
	CD at 5 %	0.220	0.88

Table.3 Effect of different levels of pruning on number of flowers per plant

Treatment No.	Treatments Details	Mean number of flowers per plant
T ₁	Pruning at 20 cm	3581.42
T ₂	Pruning at 30 cm	3607.99
T ₃	Pruning at 40 cm	3643.09
T ₄	Pruning at 50 cm	3838.85
T ₅	Pruning at 60 cm	3285.53
T ₆	Control	1922.94
	SE ±	27.61
	CD at 5 %	82.83

Table.4 Effect of different levels of pruning on yield of Flowers/plant (g), per plot (Kg) and per hectare (q)

Treatment No.	Treatments Details	Yield/plant (g)	Yield/plot (kg)	Yield/hectare (q)
T ₁	Pruning at 20 cm	711.63	14.23	49.40
T ₂	Pruning at 30 cm	731.34	14.63	50.79
T ₃	Pruning at 40 cm	741.37	14.82	51.45
T ₄	Pruning at 50 cm	806.19	16.12	55.97
T ₅	Pruning at 60 cm	649.55	12.99	45.10
T ₆	Control	325.94	6.51	22.63
	SE ±	5.17	0.10	0.11
	CD at 5 %	15.52	0.33	0.34

The results obtained in the present study are on similar line and in conformity to those findings reported by Zieslin and Mor (1981) in roses. Similar results were reported by Mutthuswami (1983) in Rose.

Yield of flowers per plant (g), per plot (kg) and per hectare (q)

Maximum yield of flower per plant was obtained in treatment T₄ followed by treatment T₃ and T₂ respectively. Reduced yield of flower per plant was recorded in treatment T₆ (control). The findings are in the line with Ghulam *et al.*, (2001) to indicate that the optimum level of pruning (12, 15 and 18 inches) above ground level for rose cultivars were the best in terms of performance of growth, number and size of flowers 18 inches pruning levels was most promising in terms of yield. Similar results were reported by Irulappan (1983).

The data pertaining to yield of flowers indicated significant increase in the yield per plot as well as per hectare in 50 cm pruning height (T₄) from ground level. Maximum yield of flower per plot and per hectare was observed in treatment T₄ followed treatment T₃ and T₂ respectively. Reduced yield of flower per plot and per hectare in treatment T₆ (control). Sharma and Singh (1991)

reported that all treated plants irrespective of amount of pruning produced significantly higher flower number and flower yield in comparison to unpruned plants.

The present investigation revealed that in general pruning in Mogra (*Jasminum sambac* L.) found effective in increasing flowering and yield of flowers. On the basis of present studies it can be concluded that Pruning is most important practice in jasmine that can enhance the health, vigour and aesthetics of mogra plant. Pruning makes the plant strong and build up a good frame work. It is important for maintenance of floriferousness and flower quality along with vigour of jasmine plant.

Pruning at 50 cm height from the ground level was found effective for enhancing flowering and yield of flowers (2.5 times more yield than control) in mogra. This might be due to the accelerated mobility of photosynthetic from the source to the sink as influenced by growth hormone released or synthesized due to higher plant growth, diverting its energy for production of new shoots and due to increase in nodes resulted from cell elongation and cell division. However, the results are based upon only one trial. To arrive at proper conclusion few more trials are essential.

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References

- Bhattacharjee, S.K., (1980). Native Jasmine of India. *Indian perfumer*, 24 (3): 126-133.
- Degeyter, Z. (1975). The pruning of glass house roses. I. B. Y. O., *Mededelingen*, 80:6.
- Ghulam (2001). Evaluation of six exotic rose cultivar by three different pruning intensities. *Sarhad J. of Hort.*, 17(1): 91-96.
- Irulappan (1983). Effect of severity of pruning time on the flower yield in Edward rose. *South Indian Hort.*, 31(6): 305-306.
- Mukhopadhyay, A., Sujata, K. and Singh, K. P. (1987). A note on influence of different levels of pruning on growth and flowering of rose. Cv. Happiness. *Indian J. Hort.*, 44 (1-2): 102-103.
- Muthuswami (1983). Effect of severity and time of pruning on the flower yield in Edward rose. *South Indian Hort.*, 31 (6): 305.
- Nanjan, K., Muthuswami, S. and Rao, Y. N. M. (1974). Studies on the effect of different levels of pruning on Edward rose. *South Indian Hort.*, 22 (1-2): 37-40.
- Pal, V.T. and Bose T.K. (1980). Effect of different time and height of pruning on growth and yield of flowers in *J. sambac* var. Khoya in national seminar on production technique for commercial flowers Coimbatore, pp: 27-29.
- Sharma C. K. and Singh I. P., (1991). Studies on the effect of different levels of pruning in *Jasminum sambac*. Haryana J. of Horticulture sci. 20 (3-4): 176-182.
- Singh, R. P. and Moe, T. A., 1980, Effect of different heights of pruning on flowering and essential oil content and its quality in *Jasminum* species. *Indian Perfumer*, 20(1): 251-253.
- Uma, S. and Gowda, J.V.N. (1987). Studies on the effect of pruning, nutrients and their interaction on the growth and flowering of rose Cv. Super Star. *Mysor J. of Agric. Sci.*, 21 (4): 455-460.
- Zieslin, N. and Mor, Y. (1981). Plant management of greenhouse rose. The pruning. *Scientia Horti.*, 14(3): 285-293.