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## Studies on performance of rose genotypes for growth, yield and quality parameters under northern transitional zone of Karnataka

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### Abstract

A field experiment was conducted at Hi-tech Horticulture, Saidapur farm, Department of Horticulture, University of Agricultural Sciences, Dharwad during 2019-20 and 2020-21 with a view to study the growth and yield of different rose genotypes. The experiment was laid out in Randomized Block Design with newly planted thirty seven rose genotypes, with two replications. The results of the experiment revealed that, the genotype (T<sub>15</sub>) Lobo recorded maximum plant height (89.86 cm), plant spread in E-W (75.94 cm) and N-S (74.04 cm) direction, number of primary (7.10) and secondary (8.20) branches per plant, number of leaves per plant (148.75), stem girth (20.59 mm), yield parameter such as maximum number of flowers per plant (46.60) and quality parameters like bud length at tight bud stage (5.36 cm). While maximum bud diameter at tight bud stage (3.78 cm) was found in the genotype (T<sub>36</sub>) Gladiator. Whereas, minimum plant height (43.19 cm), plant spread in E-W (35.14 cm) and N-S (33.13 cm) direction, number of primary (3.78) and secondary (3.77) branches per plant, number of leaves per plant (38.75), stem girth (11.45 mm) and yield parameter viz., minimum number of flowers per plant (17.17) were noticed in the genotype (T<sub>23</sub>) Confetti. However, the minimum bud length and bud diameter at tight bud stage was recorded in the genotype (T<sub>35</sub>) Arka Sinchana (2.69 and 2.29 cm respectively).

**Keywords:** Rose, genotypes, growth, yield and quality

### Introduction

Rose (*Rosa* spp.) belongs to the family Rosaceae and remains a major ornamental plant for cut flower trade all over the world. It is considered to be an ancient flower and scientists assume that the evolution of rose started 60 million years and originated in Asia. Rose is the most popular of all the flowers because of its beauty and fragrance and is called the "Queen of Flowers". Roses are immensely important for landscaping and no garden is considered complete without roses. Rose flowers without stalk and loose flower petals are used in traditional markets for making garlands, for offering in temple, while the cut roses with stalk mainly used for bouquets, interior decoration, religious and social functions and floral arrangements. Besides Damask rose (*Rosa damascena*) and Edward rose (*Rosa bourboniana*) are cultivated for rose attar and other products. Rose petals are used for making candy, wine, gulkand, rose water, rose oil and rose perfume. As the commercial cultivation of rose is gaining importance, introduction and identification of high yielding genotypes is necessary. Hence, it is important to study morphological variation and performance of rose in respect of growth and yield. Therefore, the present study entitled "Studies on performance of rose genotypes for growth, yield and quality parameters under northern transitional zone of Karnataka".

### Material and Methods

An experiment entitled "Studies on performance of rose genotypes for growth and yield parameters under northern transitional zone of Karnataka" was carried out at Hi-tech Horticulture, Saidapur farm, Department of Horticulture, College of Agriculture, University of Agricultural Sciences, Dharwad during November 2019 to March 2020 and November 2020 to March 2021.

Experiment was laid out in RBD with two replications and 37 genotypes *viz.*, Dick Clark, Double Delight, Parole, Love and Peace, Cabaret, Jazz Festival, Eterna, Saiun, The Malartine Rose, Pierre Ardit, Peduse, Rouge Mekland, Sophocle, ST Patrick, Lobo, Michel Desjoy, Paneer Rose, Melody De Perfume, Lily The Pink, Grand Amore, Powder Puff, Classic, Confetti, Princess De Monaco, Gold Strike, Tajmahal, ArkaParimala, Arka Savi, Arka Sukanya, Arka Swadesh, Arka Ivory, Arka Pride, Arka Kinnari, Arka Sharmeeli, Arka Sinchana, Gladiator and Sofia Laurence.

The planting of these rose genotypes was carried out during July 2019 and the experiment was started from November 2019 to March 2020 and November 2020 to March 2021 after pruning. Light digging operation was done to loosen the soil for better aeration. The experimental field was prepared to a fine tilth by deep ploughing and harrowing and farm yard manure was incorporated at the rate of @ 20 t ha<sup>-1</sup> and mixed well. The experimental beds were prepared as per the plan of layout. The healthy budded rose plants were selected and planted in zig-zag double row system with the spacing of 60 cm × 60 cm. Recommended dose of nutrients @ 200 kg N, 200 kg P<sub>2</sub>O<sub>5</sub> and 100 kg K<sub>2</sub>O ha<sup>-1</sup> was applied. Half dose of N, full dose of P and K were applied as a basal dose at the time planting using budded plants and remaining half dose of N was given one month after planting. Fertilizers were applied in the form of Urea, Diammonium phosphate (DAP), Single Super Phosphate (SSP) and Muriate of Potash (MOP). Four plants from each genotype were selected and used for recording observations. Observations in respect of vegetative growth *viz.*, plant height, plant spread in E-W and N-S direction, number of primary and secondary branches per plant, number of leaves per plant and stem girth, yield parameters *viz.*, number of flowers per plant and quality parameters like bud length and bud diameter at tight bud stage were recorded during research work and data were statistically analyzed in RBD as per method given by Panse and Sukhatme (1967) [8].

## Result and Discussion

The data in table 1 revealed that, significant differences were recorded among the rose genotypes in respect of growth, yield and quality parameters.

Significantly maximum plant height was observed in the genotype 'Lobo' (89.86 cm) and minimum was found in the genotypes 'Confetti' (43.19cm) (Fig. 1). This might be due to the genetic makeup of the different genotypes. Similar results were in accordance with the outcomes of Mohanty *et al.* (2011) [6] and Pradhan *et al.* (2017) [9].

Significant plant spread in E-W and N-S direction was found in all the genotypes. Maximum plant spread in E-W and N-S direction was recorded in the genotype 'Lobo' (75.94 and

74.04 cm respectively), and minimum was observed in the genotype 'Confetti' (35.14 and 33.13 cm respectively)(Fig. 1). The variation in plant spread might be due to the different genetic constitution of the genotypes. The results are in agreement with the findings of Nasri *et al.* (2016) [7] and Soujanya *et al.* (2018) [10].

The genotype 'Lobo' recorded the maximum number of primary and secondary branches per plant (7.10 and 8.20 respectively) and minimum was noticed in the genotypes 'Confetti' (3.78 cm and 3.77 respectively). This might be due to the inherent genetic factors promote the higher production of substances like auxin, cytokinin and gibberllin. The variation in genotypes might be due to the different genetic makeup of the genotypes. Similar variations for number of branches were also observed in rose by Atram *et al.* (2015) [2] and Wasnik *et al.* (2016) [12], Significantly highest number of leaves per plant was recorded in the genotype 'Lobo' (148.75) which was with the genotype Lily The Pink (140.75), whereas, the lowest number of leaves per plant was noted in the genotypes 'Confetti' (38.75). This might be due to the inherent genetic factors, higher sprouting of auxiliary buds, endogenous production of cytokinin, auxin and gibberllin. These consequences were in close agreement with the findings of Wasnik *et al.* (2016) [12] and Abd-Elrahim and Osman (2017) [1].

Significantly the maximum stem girth was noticed in the genotype 'Lobo' (20.59 mm) followed by the genotypes Lily The Pink (19.52 mm), Peduse (17.00 mm) and Saiun (16.55 mm). Whereas, minimum stem girth was recorded in the genotype 'Confetti' (11.45 mm). The results are in close agreement with findings of Gogoi *et al.* (2016) [3] and Jogdande *et al.* (2017) [4].

Significantly the maximum number of flowers per plant was recorded in the genotype 'Lobo' (46.60) followed by the genotype Saiun (41.33). The minimum number of flowers per plant was observed in the genotype Confetti (17.17). These results were in accordance with the findings of Wasnik *et al.* (2015) [11], Gogoi *et al.* (2016) [3], Joshna and Sarkar (2018) [5] and Soujanya *et al.* (2018) [10] in rose.

Significant variation was observed for bud length and bud diameter at tight bud stage (Fig. 2). The longest bud length was recorded in the genotype 'Lobo' (5.36 cm) followed by genotype 'The Malartine Rose' (5.23 cm). While, maximum bud diameter was observed in the genotype 'Gladiator' (3.78 cm) followed by genotype Lobo (3.71 cm). Minimum bud length and bud diameter at tight bud stage was noticed in the genotype Arka Sinchana (2.69 and 2.29 cm respectively). These outcomes are in accordance with the findings of Wasnik *et al.* (2015) [11], Gogoi *et al.* (2016) [3] and Jogdande *et al.* (2017) [4] in rose.

**Table 1:** Mean performance of the rose genotypes for growth, yield and quality parameters

Treatments	Genotypes	Plant height (cm)	Plant spread (cm)		No. of primary branches/plant	No. of secondary branches/plant	No. of leaves / plant	Stem girth (mm)	No. of flowers per plant	Bud length at tight bud stage (cm)	Bud diameter at tight bud stage (cm)
			E-W	N-S							
T <sub>1</sub>	Dick Clark	82.52	72.30	69.04	6.80	6.68	100.75	15.91	35.04	3.65	2.64
T <sub>2</sub>	Double Delight	54.43	51.34	57.48	5.13	7.04	65.75	13.43	24.14	3.84	3.29
T <sub>3</sub>	Parole	56.36	45.35	49.08	4.65	6.18	54.00	12.72	19.03	4.57	2.49
T <sub>4</sub>	Love and Peace	63.83	48.95	53.71	5.09	6.41	61.38	12.30	25.00	3.41	2.57
T <sub>5</sub>	Cabaret	63.94	51.37	57.18	5.33	5.83	65.50	13.92	28.45	3.64	3.36
T <sub>6</sub>	Jazz festival	70.38	54.77	57.91	5.66	4.11	68.25	13.86	29.31	3.61	3.09
T <sub>7</sub>	Eterna	75.55	58.45	63.98	5.76	5.49	79.50	15.62	32.27	3.67	3.21
T <sub>8</sub>	Siaun	84.80	70.03	70.41	6.88	7.79	120.00	14.58	41.33	4.07	3.26

T <sub>9</sub>	The Malartine Rose	77.24	63.48	62.63	6.09	6.50	135.25	16.55	25.50	5.23	3.57
T <sub>10</sub>	Pierre Ardit	55.16	51.56	53.64	4.77	4.12	53.25	14.02	21.32	3.65	2.60
T <sub>11</sub>	Peduse	64.92	61.43	63.61	6.24	6.52	113.75	17.00	36.88	4.63	3.26
T <sub>12</sub>	Rouge Mekland	67.64	60.05	66.75	6.14	5.59	76.25	13.90	26.64	4.75	3.64
T <sub>13</sub>	Sophacle	67.15	54.63	55.19	5.85	6.18	74.50	15.11	34.91	4.09	3.22
T <sub>14</sub>	ST Patrick	69.33	54.01	61.37	5.80	6.11	67.75	14.31	30.33	3.69	2.88
T <sub>15</sub>	Lobo	89.86	75.94	74.04	7.10	8.20	148.75	20.59	46.60	5.36	3.71
T <sub>16</sub>	Michel Desjoy	63.94	51.08	54.83	5.91	4.80	87.25	14.25	28.98	3.49	3.33
T <sub>17</sub>	Paneer rose	79.46	59.16	64.16	5.78	5.84	104.00	11.34	33.03	3.36	2.48
T <sub>18</sub>	Melody De Perfume	79.56	64.44	67.09	5.93	6.25	99.50	16.16	30.15	4.55	3.23
T <sub>19</sub>	Lily The Pink	86.17	74.93	70.59	6.96	7.38	140.75	19.52	27.21	4.25	3.54
T <sub>20</sub>	Grand Amore	81.53	63.28	62.19	5.99	6.96	104.50	15.22	25.71	4.37	3.39
T <sub>21</sub>	Powder Puff	67.16	61.57	54.86	5.79	6.93	77.00	15.10	29.65	4.51	3.25
T <sub>22</sub>	Classic	77.63	55.59	69.55	5.88	5.10	89.00	16.03	33.96	4.26	3.17
T <sub>23</sub>	Confetti	43.19	35.14	33.13	3.78	3.77	38.75	11.45	17.17	3.16	2.87
T <sub>24</sub>	Princess De Monaco	56.49	57.46	56.76	5.99	4.74	71.25	14.57	32.49	4.72	3.38
T <sub>25</sub>	Gold Strike	44.93	35.47	40.33	4.32	4.71	40.00	11.87	19.60	3.32	2.53
T <sub>26</sub>	Tajmahal	50.53	43.02	45.35	4.91	4.60	45.13	11.61	21.25	4.01	3.40
T <sub>27</sub>	ArkaParimala	69.99	54.27	61.72	6.01	5.90	65.00	15.63	28.25	3.91	3.32
T <sub>28</sub>	ArkaSavi	61.81	57.23	55.50	5.58	6.19	74.50	15.46	27.71	3.07	2.48
T <sub>29</sub>	ArkaSukany	53.39	47.44	50.31	4.78	4.81	45.50	13.29	19.43	3.25	2.70
T <sub>30</sub>	Arka Swadesh	60.53	52.60	54.64	4.87	5.77	46.25	12.19	27.88	3.69	2.68
T <sub>31</sub>	Arka Ivory	63.48	57.91	59.28	5.87	5.95	74.75	14.26	27.75	3.77	2.60
T <sub>32</sub>	Arka Pride	47.22	49.07	45.19	4.48	4.49	44.25	12.26	22.13	3.51	2.52
T <sub>33</sub>	ArkaKinnari	54.16	52.07	59.00	5.50	5.14	50.25	13.65	27.63	3.83	2.61
T <sub>34</sub>	ArkaSharmeeli	61.12	50.08	53.78	5.28	5.83	71.50	14.11	29.86	3.93	3.27
T <sub>35</sub>	ArkaSinchana	58.28	49.14	53.20	5.40	6.93	88.00	14.87	38.75	2.69	2.29
T <sub>36</sub>	Gladiator	78.98	60.36	61.49	5.73	6.11	70.75	14.10	25.25	4.79	3.78
T <sub>37</sub>	Sofia Laurence	75.71	58.02	58.86	5.46	5.54	90.50	14.70	30.29	4.06	3.35
S.Em±		1.63	1.35	1.71	0.39	0.32	3.85	0.48	1.18	0.054	0.06
CD @ 5%		4.69	3.87	4.89	1.12	0.92	11.06	1.38	3.37	0.15	0.17

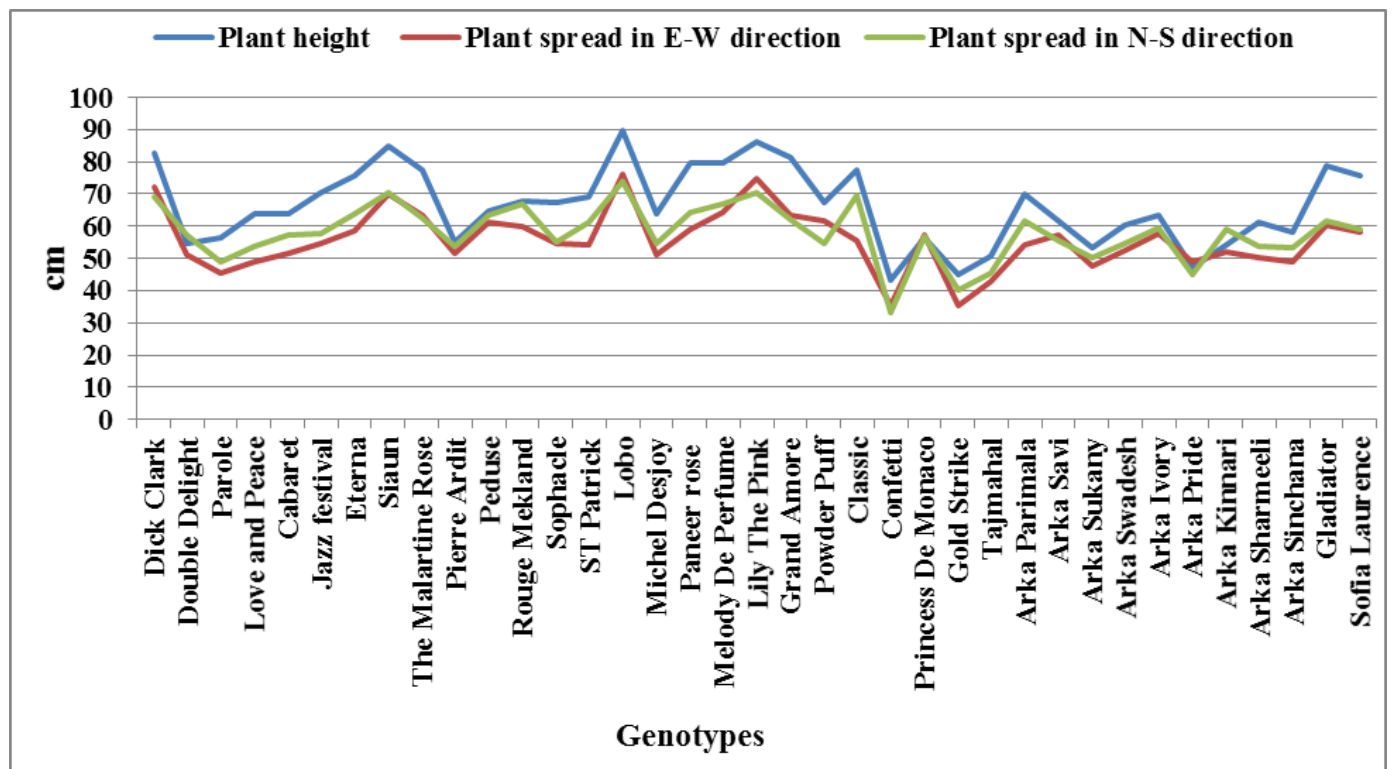


Fig 1: Mean performance of rose genotypes for plant height, plant spread in E-W and N-S direction

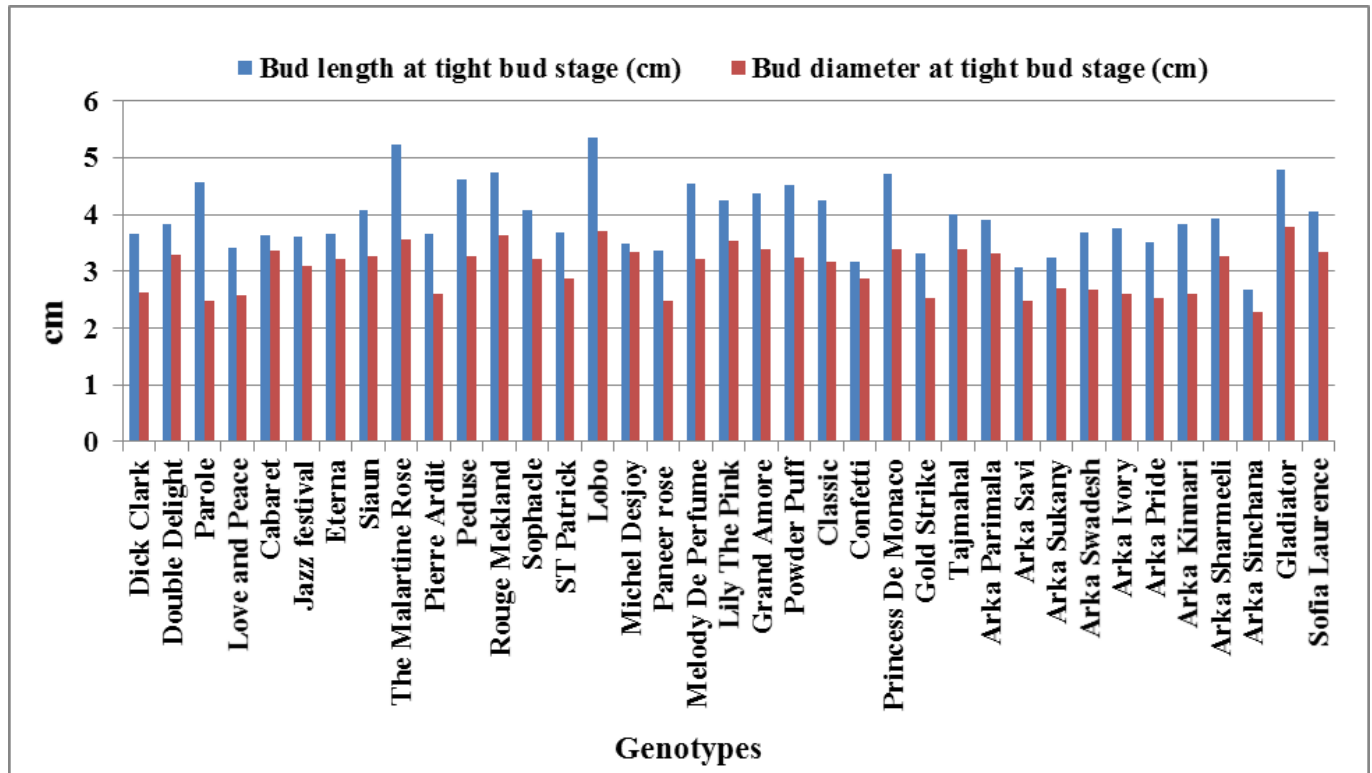


Fig 2: Mean performance of rose genotypes bud length and bud diameter at tight bud stage

## References

1. Abd-Elrahim GEE, Osman MS. Producing and evaluation of new hybrid of rose (*Rosa* spp.) in Central Sudan. *Int. J. Sci. Res. Pub* 2017;7(1):353-360.
2. Atram VR, Panchabhai DM, Shanti P. Evaluation of hybrid tea rose varieties suitable for Nagpur condition based on morphological, yield and yield contributing parameters. *J. Soils and Crops* 2015;25(2):300-305.
3. Gogoi K, Talukdar MC, Talukdar P. Morphological characterization and extent of genetic variation in rose (*Rosa hybrida* L.). *Res. Crops* 2016;17(3):579-583.
4. Jogdande PN, Patil S, Jayade VS, Saha PP, Ravikumar BS, Mohurle NA, *et al.* Studies on variability for various quantitative traits in rose (*Rosa spp.*). *J. Soils and Crops* 2017;27(1):166-171.
5. Joshna K, Sarkar MM. Varietal evaluation of hybrid tea roses under the plains of West Bengal, India. *Int. J. Curr. Microbiol. App. Sci* 2018;7(5):3006-3010.
6. Mohanty CR, Mohanty A, Das AB, Kar DS. Comparative performance of some rose varieties under open and protected environment. *Asian J. Horti* 2011;6(2):288-293.
7. Nasri F, Fadakar A, Yousefi B, Zahedi B. Evaluation of genetic diversity of some damask rose (*Rosa damascene* mill.) genotypes of Kurdistan province using morphological traits. *J. ornamental Plants* 2016;4(6):237-243.
8. Panse VG, Sukhatme PV. *Statistical methods for agricultural workers* (2<sup>nd</sup>Edn.). ICAR Publication, New Delhi (India) 1961.
9. Pradhan M, Panchbhai DM, Badge S, Bhute PN. Performance of rose varieties for growth and flowering under Nagapur (Maharashtra) conditions. *J Soil and CropS* 2017;27(1):239-242.
10. Soujanya P, Kulkarni BS, Kumar R, Munikrishnappa PM, Shivapriya M, Harshavardhan M. Evaluation of rose (*Rosa hybrida* L.) varieties for growth, yield and quality under eastern dry zone of Karnataka. *J Pharmacogn.* *Phytochem* 2018;7(5):165-168.
11. Wasnik P, Raut VU, Bhande MH, Shambhavkar VB. Evaluation of scented rose varieties for yield and quality of flowers. *Plant archives* 2015;15(2):895-897.
12. Wasnik P, Raut VU, Bhande MH, Shambhavkar VB. Evaluation of scented rose varieties for growth and flowering. *J Soils and Crops* 2016;26(1):85-87.