



# Evaluation of Different Varieties of Miniature Roses (*Rosa chinensis minima*) under Prayagraj Agro-climatic Conditions

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## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

## Article Information

DOI: <https://doi.org/10.9734/ijpss/2024/v36i84881>

## Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/120962>

**Original Research Article**

**Received: 08/06/2024**  
**Accepted: 30/07/2024**  
**Published: 03/08/2024**

## ABSTRACT

An experiment was carried out in the Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology And Sciences, Prayagraj, from November, 2023 to May, 2024. The experiment was conducted in a Randomized Block Design with twelve varieties replicated thrice. Varieties were Red Hot, Magic Carousel, Rosy, Calpoly, Beauty Secret, Hocky Pocky, Ruby Ruby, Rainbow's End, Jet Trail, Cricket, Black Jade, and Jeane Kennealy. Variety Ruby Ruby emerged promising for parameters like plant height (25.9 cm), number of branches (10.9), duration of flowering (164 days), and number of flowers per plant (285.9) whereas,

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**Cite as:** Haldar, Meghna, and Urfi Fatmi. 2024. "Evaluation of Different Varieties of Miniature Roses (*Rosa Chinensis Minima*) under Prayagraj Agro-Climatic Conditions". *International Journal of Plant & Soil Science* 36 (8):503-7. <https://doi.org/10.9734/ijpss/2024/v36i84881>.

plant spread (31.4 cm<sup>2</sup>) was better in variety Jeane Kennealy. Variety Red Hot performed better in days taken to first flowering (32 days). Bud diameter (1.1 cm) was better in the variety Magic Carousel.

*Keywords: Miniature rose; varieties; growth; flowering.*

## 1. INTRODUCTION

Roses are particularly one of the most attractive and in-demand flowers among the world's various floriculture crops. Rose's word springs from a Latin word "Erose" denoting the "God of love" [1]. Rose, genus *Rosa*, belongs to the family Rosaceae and is one of nature's most beautiful creations. It is universally acclaimed as the Queen of Flowers and is one of the world's most popular flowers. The history of miniature roses is relatively unknown.

Miniature roses first came as an accidental result of rose hybridization. Miniature roses are dwarf bushes with little leaves and flowers. According to the American Rose Society, miniature roses are of 3 types of micro-mini rose is the smallest class which only reaches 12–14 inches in height and the bloom is the size is very small when fully opened and can be grown in a flower pot. Large miniature roses are a little bigger than the micro-mini roses, can get 2-3 feet high and their blooms are 1–2 inches across. Another is mini flora which is a relatively new class of rose due to its size. Plants reach 3–4 feet in height and blooms can be 3 inches across. It got its name because it is bigger than a miniature and not as big as a Floribunda. Miniature roses have gained much popularity mainly because of their diverse and interesting flower forms and color (except true blue or black) and growth habits. Miniature roses tend to be quite hardy and can be grown in beds and containers. They do best in full sun, at least six to eight hours per day. Though they can tolerate a bit of shade, oftentimes their foliage and flowers will become sparse in shady conditions.

Miniature roses have multipurpose uses planted in pots, garden displays, landscape plantings, miniature bushes, little cut bouquets, etc. They are stunning and cheerful in the garden. They can also be used as lovely low hedges and borders. Many miniature rose varieties make adorable little cut bouquets for the home and special occasions. Their small size makes miniature roses ideal for edging, mass plantings, and rock or herb gardens.

Today miniature roses are produced by the millions in countries all over the world. In some countries most miniature roses are sold as budded or grafted stock. Mini are sold at the exact point when they are in full bloom. The beauty of these miniatures is that they are produced in 11 weeks and thus are much more economical to market than those currently available. The increasing popularity of miniature roses motivated the hybridizers into breeding programs and successfully developed many new miniatures.

## 2. MATERIALS AND METHODS

The field experiment was carried out in the Department of Horticulture, Sam Higginbottom University of Agriculture, Technology And Sciences, Naini, Prayagraj, from November-2023 to May-2024. Twelve varieties were used in the experiment, laid out in a Randomized Block Design, which was replicated thrice along with 40 cm x 40 cm spacing. Varieties Red Hot, Magic Carousel, Rosy, Calpoly, Beauty Secret, Hocky Pocky, Ruby Ruby, Rainbow's End, Jet Trail, Cricket, Black Jade, and Jeane Kennealy were used. The source of the grafted plants was Puspanjali Nursery, Jaspur, Kharagpur, West Bengal. Up to 120 days of observations on vegetative and floral parameters were made at 30-day intervals.

## 3. RESULTS AND DISCUSSION

### 3.1 Vegetative Variables

The mean data for different vegetative parameters, including plant height, plant spread and number of branches of miniature rose varieties are represented in Table 1.

Significantly taller plants (25.9 cm) were observed in the variety Ruby Ruby which was at par with variety Beauty Secret (25.1 cm), Magic Carousel (22.3 cm), Calpoly (22.1cm), Jeane Kennealy (22 cm) and Rosy (21.8 cm) whereas shorter plants (13.9 cm) were observed in variety Jet Trail. Significantly more plant spread (31.4 cm<sup>2</sup>) was observed in variety Jeane Kennealy which was at par with variety Rosy

**Table 1. Vegetative variables of different miniature rose varieties**

Variety	Plant height (cm)	Plant spread (cm <sup>2</sup> )	Number of branches
Red Hot	14.7	18.2	6.5
Magic Carousel	22.3	27.2	7.8
Rosy	21.8	31.3	8.3
Calpoly	22.1	23.4	8.2
Beauty Secret	25.1	28.9	8.3
Hocky Pocky	21.4	22.3	8.6
Ruby Ruby	25.9	24.4	10.9
Rainbow's End	19.8	25.1	9.9
Jet Trail	13.9	15.9	6.3
Cricket	18.5	19.3	8.3
Black Jade	18.1	24.2	8.3
Jeane Kennealy	22	31.4	8.1
<b>F-TEST</b>	S	S	S
<b>SE(d)±</b>	3.22	3.54	1.14
<b>CD<sub>0.05</sub></b>	6.72	7.39	2.39
<b>CV (%)</b>	19.27	17.85	16.92

(31.3 cm<sup>2</sup>), Beauty Secret (28.9 cm<sup>2</sup>), Magic Carousel (27.2 cm<sup>2</sup>), Rainbow's End (25.1 cm<sup>2</sup>), Ruby Ruby (24.4 cm<sup>2</sup>) and Black Jade (24.2 cm<sup>2</sup>) whereas lesser plant spread (15.9 cm<sup>2</sup>) was observed in variety Jet Trail. Significantly more number branches per plant (10.9) was observed in the variety Ruby Ruby which was at par with variety Rainbow's End (9.9) and Hocky Pocky (8.6) whereas fewer branches per plant (6.3) observed in the variety Jet Trail.

The variation among the varieties for different vegetative parameters like plant height, plant spread, and number of branches per plant may be due to differences in the genetic makeup and climatic conditions of the area. Plant height variation may be due to differences in rapid meristematic activity during the early growth stages which results in more cell division and elongation in plants. Similar variations in plant height were recorded by Sharova et al., [2] in gladiolus, Singh et al., [3] in floribunda rose, Ramzan et al., [4] in *Rosa hybrida* and Soujanya et al., [5] in rose. For flower crops, plant spread is a crucial growth characteristic. It helps to utilize the sunlight to the maximum extent. This was following the findings of Mohanty et al., [6] in rose, Chandrashekaraih et al., [7] in hybrid tea rose, Dias and Patil et al., [8] in elite rose and Sharma and Sharma et al., [9] in rose. The number of branches could be because of inherent genetic factors that encourage the synthesis of substances such as auxin, cytokinin, and gibberellin at a faster rate. Similar differences in the number of branches were also

noted by Wasnik et al., [10] in scented rose and Atram et al., [11] in hybrid tea rose.

### 3.2 Generative Variables

The mean data for different floral parameters, including days to first flowering, bud diameter (cm), duration of flowering (days), and number of flowers per plant of miniature roses varieties are represented in Table 2.

A significantly lesser number of days for first flowering (32 days) was observed in variety Red Hot which was at par with variety Jeane Kennealy (33 days), Calpoly (38 days), Hocky Pocky (38 days), Black Jade (39 days) and Rainbow's End (39.3 days) whereas greater number of days for first flowering (44.3 days) was observed in variety Beauty Secret. Significantly bigger flower bud diameters (1.1 cm) were observed in the variety Magic Carousel which was at par with variety Rosy (0.9 cm), Cricket (0.9cm), and Rainbow's End (0.9 cm) whereas smaller flower bud diameters (0.5 cm) were observed in variety Jet Trail. Significantly longer flowering duration (164 days) was observed in the variety Ruby Ruby which was at par with the variety Beauty Secret (148 days) and Jeane Kennealy (147 days) whereas a shorter flowering duration (67 days) was observed in the variety Jet Trail. Significantly more flowers per plant (285.9) was observed in the variety Ruby Ruby which was followed by the variety Beauty Secret (241.2) whereas the lesser number of flowers per plant (52.6) was observed in the variety Jet Trail.

**Table 2. Generative variables of different miniature rose varieties**

Variety	Days to 1 <sup>st</sup> flowering	Bud diameter (cm)	Duration of flowering (days)	Number of flowers per plant
Red Hot	32	0.6	131	63.3
Magic Carousel	42	1.1	117	117.3
Rosy	43	0.9	114	97.2
Calpoly	38	0.8	112	142.7
Beauty Secret	44	0.6	148	241.2
Hocky Pocky	38	0.7	126	95.3
Ruby Ruby	41	0.7	164	285.9
Rainbow's End	39	0.9	108	144.1
Jet Trail	42	0.5	67	52.6
Cricket	42	0.9	113	105.9
Black Jade	39	0.8	107	133.5
Jeane Kennealy	33	0.7	147	177.8
<b>F-TEST</b>	S	S	S	S
<b>SE(d)±</b>	3.48	0.09	13.92	10.24
<b>CD<sub>0.05</sub></b>	7.26	0.19	29.05	21.38
<b>CV (%)</b>	10.78	13.71	14.08	9.09

This may be due to the inherent characteristics, the genetic composition of the different varieties and the agro-climatic conditions of the region. The varieties adapting well to the given agro-climatic conditions might have performed better while varieties struggling to adapt might have performed poorly. Variation in flowering parameters such as days taken to first flowering, bud diameter, flowering duration and number of flowers per plant. Variation in days taken to first flowering was reported by Chandrashekaraiah et al., [7] in hybrid tea roses. Variation in bud diameter was reported by Singh et al., [12] in rose. Variations in flowering duration were reported by Gaikwad and Patil, [13] in Chrysanthemum and Pal et al., [14] in Gerbera. Variations in the number of flowers per plant were observed by Ramzan et al., [4] in *Rosa hybrida*. This might be due to an increase in morphological characteristics such as plant height, number of leaves and area of leaves, which may have initiated the production of more photosynthates resulting in a greater accumulation of dry matter which in turn produces more number of flowers per plant.

#### 4. CONCLUSIONS

It is concluded from the present investigation that 12 miniature rose varieties under study showed

significant variation in all the parameters studied. Variety Ruby Ruby showed significantly better performance in vegetative parameters including plant height, plant spread, number of branches per plant and flowering parameters including longer flowering duration, and more number of flowers per plant. Variety Jeane Kennealy showed significantly better performance in vegetative parameter plant spread and flowering parameters including first flowering and longer flowering duration. Also Variety Beauty Secret performed better in vegetative parameters including plant height, plant spread and flowering parameters like longer flowering duration and more number of flowers per plant. Variety Red Hot performed better in days taken to first flowering. Bigger flower buds were observed in a variety of Magic Carousel.

#### DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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