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Evaluation of different cultivars of *Salvia splendens* under Allahabad agro climatic conditions

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Abstract

An investigation, "Evaluation of Different Cultivars of *Salvia splendens* Under Allahabad Agro Climatic Conditions," was carried out in the Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences. Eight cultivars of *Salvia splendens* were evaluated using Randomized Block Design with the aim to assess salvia cultivars for growth, flowering and their blooming period. The results revealed that the cv. Vista White had the maximum plant height (21.26 cm), maximum number of leaves (50.00), maximum number of branches (12.00), maximum number of spikes (9.00) and maximum number of florets (28.00) per spike, maximum plant spread (21.13 cm), earliness (29.33 DAP), maximum spike length (20.08 cm), maximum rachis length (16.19 cm) and maximum duration of flowering (64.33 days).

Keywords: Evaluation, *Salvia splendens*, cultivars

Introduction

Landscaping is the design and alteration of a portion of land by use of planting material and land reconstruction. Colourful ornamental plants and flowers play a significant part in making the environment beautiful and refining the minds of inhabitants through landscaping. Demands and needs for flower production, especially of annual flower species, are constantly increasing all over the world (Zeljko *et al.*, 2010) [22].

However, modern flower production is practiced by transplanting flowering plants in different container systems (Latimer, 1991) [6], using different suitable substrates and application of different controlled release fertilizers (Nelson, 2003).

The term *Salvia* is referred from the Latin word 'salvo' which means 'to save'. The genus *Salvia* belongs to the family Lamiaceae, phylum Angiospermae, sub-phylum dicotyledoneae and species *splendens* (Mabberley, 1997 & Harley *et al.*, 2004) [7, 4]. Various species of *Salvia* are cultivated for their aromatic characteristics and also used as flavourings, food condiments, cosmetics and perfume additives (Firdous *et al.*, 1999) [2].

The various species of *Salvia* produces spikes of red, purple, pink, salmon, white or bicolored flowers. Red colour flowers are most common in *Salvia*. Usually, the plant grows 30 cm to 45 cm tall and about 30 cm wide, but heights range from 15 to 90 cm, depending on the cultivar. *Salvia* produces one good flower display for several weeks, then stops flowering (Edward & Teresa, 1999) [1].

Material and Methods

The present investigation on Evaluation of Different Cultivars of *Salvia splendens* under Allahabad Agro Climatic Conditions during of the year, 2017-18 the details of materials used, procedures followed and criteria adopted for evaluation of varieties during the course of investigation are presented in this chapter.

The experiment was carried out at the Departmental Research Field, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology And Sciences, Allahabad (U.P.) -211007 to find out the best performing cultivars of salvia for this region.

Allahabad is located at an elevation of 78 MSL at 25.87 degree north altitude and 81.15 degree E longitude. The Allahabad region is the south east part of Uttar Pradesh consisting of subtropical climate with the temperatures low and high i.e. the winter and the summer. In cold winter, the temperature sometimes is as low as 320C in the months of December-January whereas too hot summer with temperature reaching up to 450C during the month of May and June. During winter, frost during summer, hot scorching winds are also not uncommon.

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The average rainfall is around 1014.4mm with maximum concentration during July-September months with occasional showers in winter. The average monthly rainfall, relative humidity, minimum and maximum temperature recorded during experimental period

Results and Discussion

Plant height

Maximum plant height (21.26 cm) was recorded in cv. Vista White which was at par with cultivar Vista Purple (20.93 cm) followed by cultivar Vista Red (20.74 cm). Minimum plant height (19.25 cm) was observed in cultivar Vista Salsa (Table. 1). Marked variation in plant height is due to differential characters of individual cultivars that expressed their genetic characters. A similar variation in plant height among gerbera cultivars was observed by Reddy *et al.* (2003) [15].

Plant spread

Maximum plant spread (21.13 cm) was recorded in cv. Vista White which was at par with cultivar Vista Purple (20.96 cm) followed by cultivar Vista Red (20.76 cm). Minimum plant spread (19.34 cm) was observed in cultivar Vista Salsa (Table. 1). Plant spread differed significantly among all the cultivars studied which is due to genetic makeup of the cultivars and development of more secondary branches in the cultivars thereby increasing plant spread. The results are concluded in accordance with the findings of Singh & Ramachandran (2002) and Thomas *et al.* (2004) [18, 20].

Number of branches

Maximum number of branches per plant (12.00) was recorded in cv. Vista White which was at par with cultivar Vista Purple (11.67) followed by cultivar Vista Red (11.33). Minimum number of branches per plant (10.33) was observed in cultivar Vista Salsa (Table. 1). The variation among the cultivars in number of branches is due to the genetic difference as most of the characters are governed by genetic make-up of the cultivars. A similar variation in plant height among gerbera cultivars was observed by Wankhede & Gajbhiye (2013) [21].

Number of leaves per plant

Maximum number of leaves per plant (50.00) was recorded in cv. Vista White which was at par with cultivar Vista Purple (48.33) followed by cultivar White Salmon (48.00). Minimum number of leaves per plant (43.67) was observed in cultivar Vista Salsa (Table. 1). The difference in number of leaves per plant among the cultivars is due to differential genetic make-up and varied growth rate of the different cultivars. A similar variation in plant height among gerbera cultivars was observed by Sarah *et al.* (2014).

Number of spikes

Number of spikes as above varied significantly. Maximum number of spikes per plant (9.00) was recorded in cv. Vista White which was at par with cultivar Vista Purple (8.67) followed by cultivar Vista Red (8.33). Minimum number of spikes per plant (7.00) was observed in cultivar Vista Salsa (Table. 1). This is a genetic factor therefore, it is expected to vary among the cultivars. A similar variation in plant height among gerbera cultivars was observed by Meeramanjusha *et al.* (2003) [9].

Number of florets

Number of florets as above varied significantly. Maximum number of florets per plant (28.00) was recorded in cv. Vista White which was at par with cultivar Vista Purple (27.33 cm) followed by cultivar Vista Red (26.67). Minimum number of spikes per plant (25.33) was observed in cultivar Vista Salsa (Table. 1). The results are concluded in accordance with the findings of Nair & Medhi (2002) [11] in gerbera.

Spike length

Maximum spike length (20.08 cm) was recorded in cv. Vista White which was at par with cultivar Vista Purple (19.87 cm) followed by cultivar Vista Red (19.25 cm). Minimum spike length (16.75 cm) was observed in cultivar Vista Salsa (Table. 1). The spike length is a genetic factor therefore it is expected to vary among the cultivars as earlier observed by Sarkar & Ghimray (2004).

Rachis length

Maximum rachis length (16.19 cm) was recorded in cv. Vista White which was at par with cultivar Vista Purple (15.95 cm) followed by cultivar Vista Red (15.64 cm). Minimum spike length (13.55 cm) was observed in cultivar Vista Salsa (Table. 1). Marked variation in rachis length is due to differential characters of individual cultivars that expressed their genetic characters.

Duration of flowering

Maximum duration of flowering (64.33 days) was recorded in cv. Vista White which was at par with cultivar Purple scarlet sage (58.67 days) followed by cultivar Vista Purple (58.33 days). Minimum duration of flowering (49.33 days) was observed in cultivar Vista Salsa (Table. 1). The variation in duration of flowering among the cultivars can be attributed to differences in genetic makeup of plant. Rao *et al.* (2005) [14] reported maximum flower duration in marigold cv. Orange Double.

Table 1: Growth parameters

Cultivars	Plant height (cm)	Plant spread (cm)	No. of Branches	No. of Leaves	No. of spikes	No. of florets	Spike length (cm)	Rachis length (cm)	Duration of flowering	Earliness
Vista White	21.26	21.13	12.00	50.00	9.00	28.00	20.08	16.19	64.33	29.33
Vista Purple	20.93	20.96	11.67	48.33	8.67	27.33	19.87	15.95	58.33	31.33
Vista Red	20.74	20.76	11.33	47.33	8.33	26.67	19.25	15.64	55.33	36.33
Red Scarlet Sage	20.45	20.53	10.67	46.00	7.67	26.33	18.90	15.04	54.33	45.33
Vista Salsa	19.25	19.34	10.33	43.67	7.00	25.33	16.75	13.55	49.33	51.33
Vista Orange	19.87	19.83	11.00	45.00	7.33	26.00	17.59	14.78	53.33	39.00
White Salmon	20.65	20.25	11.67	48.00	7.67	26.67	18.65	15.25	56.33	31.67
Purple Scarlet Sage	20.35	20.85	11.33	47.67	8.33	27.00	19.02	15.56	58.67	37.67
Vista White	21.26	21.13	12.00	50.00	9.00	28.00	20.08	16.19	64.33	29.33

Earliness

Earliness was recorded in cv. Vista White (29.33DAP) which was at par with cultivar Vista Purple (31.33 DAP) followed by White Salmon (31.67DAP). The cultivar Vista Salsa was late among all variety (51.33DAP) (Table. 1).

Earliness in cultivar Vista White is due to its better growth and development in terms of maximum number of leaves, branches and plant spread which resulted in higher production accumulation of sugar leading to switching of vegetative phase in reproductive phase.

Conclusion

Based on present investigation it is concluded that among the eight cultivars of *Salvia splendens* studied, cultivar Vista White gave best response in terms of plant growth, flowering characters and duration of flowering under Allahabad agro-climatic conditions.

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