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***In vivo* sucker production in gerbera hybrids (*Gerbera jamesonii* Bolus ex Hooker f.) hybrid cultivars under poly-shade net structure during winter season**

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Abstract

Abstract *Gerbera (Gerbera jamesonii)* also commonly known as Transvaal Daisy belongs to the family Asteraceae. It ranks fourth in the international cut flower market. A field experiment was conducted in the year 2016-2018 to study the *In vivo* sucker production in gerbera (*Gerbera jamesonii* Bolus ex Hooker f.) hybrid cultivars under poly shade-net structure during the winter season at Biotechnology and Tissue Culture Centre (BTCC), Baramunda, college of Agriculture, OUAT, Bhubaneswar. The experiment was conducted in a Complete Randomized Design (CRD) having 20 treatments i.e 20 varieties of *Gerbera jamesonii* and 3 replications. Cultivars Allian Ducassee, Snow Ball, Zembla, Scala, Rosario, Glamore, Winter Queen, Prime Rose, Salva Dore, Shimmer, Toast, Seth, Carmbole, Rihanna, Artist, Dia Bole, Inferno, Gold Strick, Amulet and Real were procured from KF-Bio plants Pvt. Ltd., Pune and planted in 12" size pots containing sterilized garden soil: FYM: Coco peat: Sand ratio in 1:1:1 (v/v) proportions under poly shade net structure. In the experiment 20 plants per treatment were taken. The result revealed that in the month of November the cvs. Amulet significantly showed increased the number of suckers per plant (3.89) and the data stood at par with cultivar Salva Dore (3.81) and Snow Ball (3.79). In the month of December the cultivars Amulet and Snow Ball enhanced the number of suckers per plant (4.08) and significantly at par with many cultivars like Zembla, Rosario, Salva Dore, Shimmer, Seth, Dia Bolo and Gold Strick. In the winter season the number of suckers per plant was found maximum (5.50) in cv. Carambole in the month of January.

Keywords: *Gerbera jamesonii*, poly-shade net, variety, suckers, CRD, treatment, stood

Introduction

Gerbera (Gerbera jamesonii L.) also commonly known as Transvaal Daisy is an important cut flower grown throughout the world with long stalks and daisy-like flower, belongs to the family Asteraceae. Variety in colour has made this flowering plant attractive for use in garden decorations, such as herbaceous borders, bedding, and pots and for cut flowers as it has a long vase life (Bose *et al.*, 2003; Chauhan, 2005) [2, 3]. It ranks fourth in the international cut flower market and a popular cut flower in Holland, Germany and USA (Choudhary and Prasad, 2000) [5]. It is difficult to get good quality cut flowers of gerbera under open field conditions. To meet the qualitative and quantitative standards, hybrid cultivars have to be grown under protected conditions (Pattanashetti, 2009) [8]. Previously, in a performance study of gerbera varieties, Sankar *et al.* (2003) [12], grew gerbera under protected conditions and observed better growth, yield and quality characteristics under protected. Under protected conditions, gerbera grows faster and produces larger and greener leaves with high dry matter content. As a result, the yield of the flowers increases and more side shoots will be formed. Protected conditions provide favourable environment for the growth of the plants by protecting the crop from heavy winds, pests, diseases and other climatic conditions. The market requirement for cut flowers is very specific and it can be met consistently, only when the crop is grown under protected conditions. Gerbera as a cut flower has tremendous demand in domestic and international markets. Though, different varieties of gerbera exist in Odisha, none has been officially released. Abrol, A.; Chaudhary, S. V. S. and Dhiman, SR. (2019) [1]. Integrated nutrient management (INM) in commercial flower crops - a review. *Agriculture international*, 6 (1): 17-22. Hence, it is needed to evaluate varieties for their vegetative, yield and quality characters and finally to recommend the suitable variety for the agro-climatic conditions of Odisha. Considering the above facts, the present research work was undertaken to study the performance of 20 gerbera varieties under poly-shade net structure.

Materials and Methods

A field experiment was conducted in 2016-2017 at Biotechnology and Tissue Culture Centre (BTCC), Baramunda, college of Agriculture, OUAT, Bhubaneswar.

The experimental design used was Complete Randomized Design (CRD) having 20 treatments i.e 20 varieties of *Gerbera jamesonii* and 3 replications. In the experiment 20 plants per treatment were taken.

Table 1: Description of characters of different gerbera hybrid /cultivars

Sl. No.	Cultivars	Flower of the ray florets Colour	Colour of the disc	Flower Type	Purpose
1	Allian Ducassee	Cream	Black	Semi dual	Cut flower standard
2	Snow Ball	White	Green	Semi double	Cut flower standard
3	Zembla	White	Green	Semi double	Cut flower
4	Scala	Pink	Black	Semi double	Cut flower
5	Rosario	Pink	Black	Semi double	Cut flower
6	Glamore	Lilac	Black	Semi double	Cut flower standard Gerbera
7	Winter Queen	White	Black	Semi double	Cut flower
8	Prime Rose	Pink	Green	Semi double	Cut flower
9	Salva Dore	Orange	Black	Semi double	Cut flower
10	Shimmer	White	Black	Semi double	Cut flower
11	Toast	Yellow	Black	Semi double	Cut flower
12	Seth	Lilac	Black	Pomponi	Cut flower
13	Carmbole	Red	Green	Semi double	Cut flower
14	Rihanna	Lilac	Green	Semi double	Cut flower
15	Artist	White	Black	Semi double	Cut flower
16	Dia Bole	Pink	Black	Semi double	Cut flower
17	Inferno	Red	Black	Semi double	Cut flower
18	Gold Strick	Golden yellow	Black	Single	Cut flower
19	Amulet	Yellow	Black	Semi double	Cut flower
20	Real	Orange	Black	Semi double	Cut flower

Twenty cultivars of gerbera were procured from KF-Bio plants Pvt. Ltd., Pune and planted in 12" size pots containing sterilized garden soil: FYM: Coco peat: Sand ratio in 1:1:1 (v/v) proportions in July, 2015 under poly-shade net structure. Poly shed net structure with polythene 200 micron thick, UV stabilized, anti-dust, with cooling effect and light diffusion of 75%. The shade net with 50% was used for providing shade during day to obtain optimum light intensity and to protect the crop from heavy rainfall during rainy season. The area of the structure was 500 m². To obtain optimum temperature and humidity inside the poly shade net structure foggers were and mist unit were used whenever required. The potted plants were regularly irrigated depending upon soil moisture and weather condition to keep the soil moisture optimum. Fertilizers were applied as N: P: K in the form of Urea: SSP: MOP @ 15:10:30g/m² was applied at monthly interval. Foliar spray of micronutrient (Multiplex) @ 2.5-3 ml/l at monthly interval was sprayed. Insecticide Rogor was applied (0.3%) 3gm/l to protect the plants from pests. Carbendazim @ 2g/l was sprayed as need based to control fungal disease. Hand weeding was done at regular intervals to keep the entire plot weed free. The observations were recorded in the 8 months old plant for various vegetative parameters. Among them number of sucker production was observed by calculating number of new shoot emergence from the mother plants.

Result and Discussion

The data presented in the (Table.2) revealed that in the month of November the cvs. Amulet significantly showed increased the number of suckers per plant (3.89) and the data stood at par with cultivar Salva Dore (3.81) and Snow Ball (3.79). In the month of December the cultivars Amulet and Snow Ball enhanced the number of suckers per plant (4.08) and significantly at par with many cultivars like Zembla, Rosario, Salva Dore, Shimmer, Seth, Dia Bolo and Gold Strick. In the month of January, significantly maximum number of suckers

per plant (5.50) was observed in the cultivars Carmbole. In the month of February the cultivar 'Winter Queen' showed maximum number of suckers per plant (4.68) and significantly stood at par with Snow Ball (4.53) and Artist (4.19).

Table 2: Number of suckers per plant (cm) of gerbera cultivars in winter season (pooled over 2 years 2016 and 2017)

Sl. No.	Cultivars name	Nov	Dec	Jan	Feb
1	Allian Ducassee	2.21	2.21	2.40	3.11
2	Snow Ball	3.79	4.08	3.33	4.53
3	Zembla	3.12	3.23	2.60	3.51
4	Scala	2.17	2.17	4.50	2.40
5	Rosario	2.59	3.29	1.70	1.89
6	Glamore	2.13	2.63	2.57	3.07
7	Winter Queen	2.06	1.85	2.60	4.68
8	Prim Rose	2.71	2.80	1.40	3.70
9	Salva Dore	3.81	3.81	3.50	3.11
10	Shimmer	3.21	3.34	3.57	2.07
11	Toast	2.14	2.57	4.30	2.75
12	Seth	3.05	3.14	4.57	2.78
13	Carmbole	2.45	2.44	5.50	2.73
14	Rihanna	1.84	1.88	2.83	3.86
15	Artist	2.33	2.33	3.50	4.19
16	Dia Bolo	3.28	3.14	2.87	3.82
17	Inferno	2.35	2.35	3.97	2.81
18	Gold Strick	3.47	3.47	2.37	2.47
19	Amulet	3.89	4.08	3.30	3.50
20	Real	2.59	2.66	2.80	1.94
	SEm±	0.14	0.33	0.15	0.18
	CD 5%	0.40	0.94	0.44	0.50

Hence, in the winter season the number of suckers per plant was found maximum (5.50) in cv. Carmbole in the month of January and other cultivars with higher number of suckers per plant are Snow Ball, Zembla, Rosario, Winter Queen, Salva Dore, Shimmer, Seth, Artist, Dia Bolo, Gold Strick and Amulet.

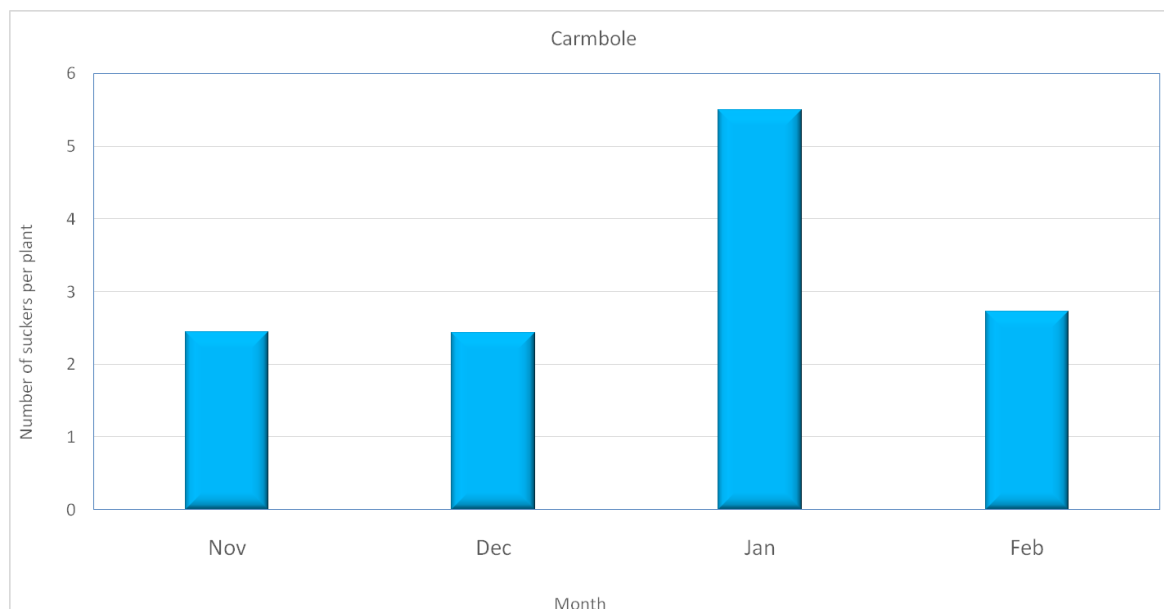


Fig 1: Number of suckers per plant (cm) of gerbera cultivar Carmbole in winter season (pooled over 2 years 2016 and 2017)



Fig 2: Full view of Gerbera research experiment under poly- shade net structure

Summary and Conclusion

Present investigation carried out under poly- shade net structure for characterisation and evaluation of different vegetative parameters of *Gerbera jamesonii* revealed that highest suckers / plant was significantly more for the cultivar Caram Bole in winter season in the month of January and other cultivars with higher number of suckers per plant are Snow Ball, Zembla, Rosario, Winter Queen, Salva Dore, Shimmer, Seth, Artist, Dia Bolo, Gold Strick and Amulet. Could be recommended as a variety for cultivation at different agro- climatic conditions of Odisha.

Future scope

A huge demand of gerbera flowers is being created in the market and as the western culture is influencing in the Indian society and this can be main reason for this gerbera flowers are sold easily from the farmers and reason being this it is getting popularity in the farmers. Availability of gerbera flowers in metro cities of India will increase the demand definitely. Demand of gerbera flowers is increasing day by day in the domestic market so it will be beneficial for the small farmers.

Conflict of Interest

Authors have declared that no competing interests exist.

Author Contributions

Use this form to specify the contribution of each author of your manuscript. A distinction is made between five types of contributions: Conceived and designed the analysis; Collected the data; Contributed data or analysis tools; Performed the analysis; Wrote the paper.

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