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Evaluation of different Dahlia (*Dahlia variabilis* L.) cultivars for production of tuber yield under Chhattisgarh plains

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Abstract

An experiment was conducted at the Department of Floriculture and Landscape Architecture, CoA, IGKV, Raipur from 2019-20 to 2020-21. The experiment was laid out in RBD with three replications and 20 cultivars with a view to find out the overall evaluation of different cultivars of dahlia. Result showed that the tuber yield parameters were observed *i.e.* number of tubers plant⁻¹ (7.96), number of tuber plot⁻¹ (113.70), weight of single tuber (86.29g), tuber yield plant⁻¹ (86.95g), tuber yield plot⁻¹ (1.78 kg) and tuber yield (2.52 t ha⁻¹) was observed in cv. T₄ (Blackout Black).

Keywords: Dahlia, tuber, yield, blackout black and Kenya yellow

Introduction

Dahlia (*Dahlia variabilis* L.) is one of the most popular flowers grown in many parts of the world for its beautiful ornamental blooms having varying shades of different colours, being useful as cut flowers besides for the beautification of gardens (Vikas *et al.*, 2015) ^[10]. They are extensively used for garden display, home decoration, cut flowers of pompon and miniature types stay fresh in flower vases for many days and also make moderately good garlands (Gupta, 2015) ^[5]. Tubers of this plant contain significant amount of insulin and fructose and small quantities of medicinally active compound such as pythin and benzoic acid. It belongs to the family Asteraceae, originated in Mexico and was declared the national flower of this country in 1963, which got its name by Cavanilles in the year 1791.

According to the National Horticulture Board, India's floriculture production area was 305 thousand hectares in 2019-20, with a cut flower production of 762 thousand tonnes. Floriculture is now commercially cultivated in several states like Andhra Pradesh (19.1%), Tamil Nadu (16.6%), Madhya Pradesh (11.99%), having gone ahead of other producing states like Karnataka, West Bengal, Mizoram, Gujarat, Orissa, Jharkhand, Haryana, Assam and Chhattisgarh. In India commercially grown major flowers such as Rose, Tuberose, Gladiolus, Anthurium, Carnation and Marigold etc., but dahlia cultivation is limited only in hills and plains of Eastern India (Anonymous, 2019) ^[2]. In the C.G. state area under floriculture is 13,089 ha⁻¹ with the production of 2,29868 MT. approximately in the 2020-21. In Chhattisgarh commercially grown major flowers like Marigold, Tuberose, Gladiolus, Roses, Gaillardia and Orchids but there is no exact scale production of dahlia is available (Anonymous, 2020) ^[3]

As Dahlia is still called an uncut diamond for India, evaluation is the stepping stone in order to utilize any crop to its full potential. Since the performance of each genotype varies with region, season and growing environment, therefore testing the performance of the available genotypes for suitability and adaptability take prime importance, as the research works on this line is meager in Chhattisgarh plains.

Dahlia is commercially propagated through rooted cutting which are prepared through tuber. Their for quality and disease-free tubers are required to fulfill the demand of rooted cuttings in Chhattisgarh state. Looking to urgency and increase production with quality planting material is urgently required in the state therefore present investigation had been laid out with the objective to find out suitable genotypes/cultivars for quality planting materials with higher number of tuber yield under the evaluation of different Dahlia (*Dahlia variabilis* L.)

Cultivars for production of tuber yield under Chhattisgarh plains.

Materials and Methods

The experiment was conducted at the Horticultural Research cum Instructional Farm, Department of Floriculture and Landscape Architecture, CoA, IGKV, Raipur, during 2019-20 to 2020-21. The soil of the research field was clay-loam and is neutral in response with the pH 7.1. For studying the evaluation and association analysis of the experimental during the years all the twenty cultivars were grown in Randomized Block Design with three replications. Standard package of practices of dahlia cultivation were followed for growing a healthy crop. Observations were recorded on five randomly selected plants, from the border plants were avoided. The experimental plots were irrigated at an interval of one week at initial stages and 10-12 days at later stages to maintain optimum moisture throughout the experimentation.

Results and Discussion

An inquisition of data showed that significant variation existed among all different cultivars of dahlia for both years and in pooled mean basis of study for tuber yield parameters.

Yield Characteristics

From the data presented in Table 1.0 the cv. Blackout Black (T₄) resulted the significantly maximum number of tubers plant⁻¹ i.e. 7.96, number of tubers plot⁻¹ (113.70) which was noted *at par* with cv. Kenya Blue (T₈) in number of tuber plant⁻¹. Whereas minimum number of tubers plant⁻¹ was observed in T₁₀ (Anita Orange Red with Gold) i.e. 3.45, minimum number of tubers plot⁻¹ 58.33. Tuber yield plant⁻¹ may be due to the genotypic expression of the genotypes. The tuber yield plant⁻¹ may be directly related to production of more plant height, number of branches, there by synthesis of more photosynthesis & ultimately good tuber yield. The similar results observed in dahlia by Ahmed and Gul (2002)^[1] and Sree Devi (2020)^[7].

Among the different cultivars studied, the cultivar Blackout Black (T₄) recorded in maximum weight of tuber (86.29 g) which was statistically *at par* with Jishu Red (T₁₁), Sachin Red (T₁₂). However, the weight of tuber (51.57 g) was minimum in cv. (T₁₀) Anita Orange Red with Gold. Variation in the bulb weight among the different dahlia cultivars under trial might due to the genetic different and local environmental condition soil structure and texture might have been responsible for the increase in weight of tubers. The variation in tuber weight may be due to the genotypic expression of the cultivars. This is in accordance with results of Gupta *et al.* (2015)^[5], Manjula *et al.* (2017)^[6], Bajaraya *et al.* (2018)^[4], Singh and Singh (2018) in Dahlia.

The cultivars exhibited that the maximum tuber yield plant⁻¹ (86.95 g) was registered in cultivar T₄ (Blackout Black). However, the minimum tuber yield plant⁻¹ (51.72 g) was registered in cv. Anita Orange Red with Gold (T₁₀). Maximum tuber yield plot⁻¹ was reported in cultivar T₄ (Blackout Black) 1.78 kg) which was statistically *at par* T₁₁ (Jishu Red) and T₁₂ (Sachin Red) whereas, the minimum tuber yield plot⁻¹ (1.07 kg) was observed in cultivar T₁₀ (Anita Orange Red with Gold). The tuber yield (t ha⁻¹) of the experiment was noted that significantly highest tuber yield (2.52 t ha⁻¹) was observed in cultivar T₄ (Blackout Black) which was statically *at par* with cultivar T₉ (Kenya Original), T₁₁ (Jishu Red) and T₁₂ (Sachin Red). While the lowest tuber yield (t ha⁻¹) was found in cultivar T₁₀ (Anita Orange Red with Gold) 1.36 t ha⁻¹.

Tuber yield plant⁻¹ (g)/ plot⁻¹ (kg)/ (t ha⁻¹) was obtained in cultivars Blackout Black and least was obtained in Anita Orange Red with Gold. Tuber yield plant⁻¹ (g)/ plot⁻¹ (kg)/ (t ha⁻¹) may be directly related to production of more number of branches, there by synthesis of more photosynthates and ultimately good tuber yield. The similar results observed in dahlia by Verma and Kulkarni (2017)^[9] and Shukla *et al.* (2018)^[8].

Table 1: Evaluation of Dahlia cultivars for tuber yield Characteristics (pooled data of three years) (pooled data of three years, 2019-20 to 2020-21)

Tr. No.	Treatments (Cultivars)	Number of tubers plant ⁻¹	Number of tubers plot ⁻¹	Weight of tuber (g)	Tuber yield plant ⁻¹ (g)	Tuber yield plot ⁻¹ (kg)	Tuber yield (t ha ⁻¹)
T ₁	Gajanan Yellow	4.69	74.34	68.65	69.87	1.45	2.13
T ₂	Babananda Yellow	4.68	64.33	60.59	61.42	1.26	1.78
T ₃	Kenya Yellow	6.58	92.33	54.05	59.46	1.21	1.55
T ₄	Blackout Black	7.96	113.70	86.29	86.95	1.78	2.52
T ₅	Ankita Pink	4.08	99.47	57.53	57.85	1.18	1.53
T ₆	Pu Sinha Pink	4.22	89.00	63.13	63.38	1.29	1.90
T ₇	Raja New Blue	4.59	79.83	64.47	64.29	1.31	1.93
T ₈	Kenya Blue	7.45	71.03	66.47	67.36	1.38	2.03
T ₉	Kenya Original	6.92	75.43	74.67	75.29	1.54	2.25
T ₁₀	Anita Orange Red with Gold	3.45	58.33	51.57	51.72	1.07	1.36
T ₁₁	Jishu Red	6.15	93.64	79.13	79.46	1.63	2.46
T ₁₂	Sachin Red	6.85	82.66	78.71	78.61	1.60	2.43
T ₁₃	Red New	5.46	61.27	61.57	60.07	1.23	1.61
T ₁₄	Matangini White	4.38	95.44	62.44	62.70	1.28	1.86
T ₁₅	S. P. Romia Roy	4.09	78.61	56.92	66.83	1.37	2.00
T ₁₆	Suparna New Bicolor	4.26	71.53	74.89	71.82	1.48	2.18
T ₁₇	Prabhujee Bicolor	4.13	89.43	61.33	55.66	1.14	1.42
T ₁₈	Prime Minister Bicolor	6.51	69.34	66.45	69.30	1.42	2.10
T ₁₉	Raja Bicolor	6.14	98.53	66.66	61.45	1.26	1.71
T ₂₀	Glory of India Bicolor	5.98	98.02	57.69	65.24	1.33	1.95
	S.E (m), (±)	0.32	3.13	2.96	2.12	0.07	0.10
	CD (p = 0.05%)	0.92	8.97	8.50	6.09	0.21	0.29

Conclusion

On the basis of result obtained of present investigation it may be concluded that cv. Red Blackout Black for higher tuber yield with more number for production of higher tuber number as well as yield of tuber under C.G. plains.

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