Study of Evaluation of Genetic Variability of Gladiolus cultivars under Agro-climatic conditions of Prayagraj, India

Abstract

A field experiment was carried out to "Study of Evaluating Genetic Variability of Gladiolus (*Gladilous grandiflorus L.*) Cultivars Under Agro –Climatic conditions of Prayagraj" was conducted at the Departmental research field of Horticulture, Naini, Agriculture Institute during Rabi season of 2022-2023. The experiment involved 15 cultivars arranged in randomized block design with three replication. The analysis of the data showed that phenotypic coefficient of variation (PCV) was higher than genotypic coefficient of variation (GCV) for all characters studied, indicating that environmental factors had a significant influence on these characters. Several traits, including number of leaves at 30DAS, corm yield per plant, number of cormels per hectare, cormel diameter, number of corms per hectare, and number of corms per plant, exhibited high PCV and GCV. Furthermore, the study found high heritability coupled with high genetic advance as a percentage of the mean for traits such as the number of leaves at 30DAS, corm yield per plant, number of cormels per hectare, cormel diameter, number of corms per hectare, and number of corms per plant. This suggests that these traits are under strong genetic control and have the potential for effective selection and improvement. Moreover, positive and highly significant correlations were observed between corm yield per plant (in grams) and various other traits, including the number of leaves at 30DAS, 60DAS, and 90DAS, number of shoots per plant, days to first flowering, rachis length, number of florets per spike, number of spikes per plant, floret length, floret diameter, number of corms per plant, corm diameter, weight of corm, number of corms per hectare, and number of cormels per hectare. These correlations indicate that these traits have a strong influence on corm yield. Based on the study's results, genotypes Yellow stone, followed by Joshka, Pusa suhagan, and Arka Naveen, were identified as high spike and corm-yielding genotypes under the agro-climatic conditions of Prayagraj.Overall, the study highlights the significant impact of environmental factors on the observed traits and provides valuable insights into the selection of gladiolus genotypes with desirable characteristics for cultivation in the Prayagraj region.

Keywords: *Gladiolus, Genotypes, Genetic variability, Growth, yield and quality.*

1. Introduction

In the world of flowers, few captivate the senses and evoke admiration quite like the Gladiolus. Gladiolus *(Gladiolus grandiflorus L.)* is a queen of bulbous flower crop. The word gladiolus is derived from the Latin word 'Gladius' meaning sword ,because of sword like leaves of this plant known as sword lily(Mishra et al., 2014). In language of flowers, the Gladiolus represents sincerity, remembrance and infatuation, making it a popular choice for expressing heartfelt emotions on special occasions and in times of grief. It is native from

South Africa belongs family Iridaceae. A member of Iris family the Gladiolus is renowned for its tall, vertical spikes adorned with multiple funnel-shaped flowers that come in a wide array of colours. From rich, velvety red to serene blues, vibrant oranges and delicate pastels, the Gladiolus offers a kaleidoscope of hues to enchant any observer. It is one of the most important bulbous crops grown commercially for cut flower, bouquets, floral arrangements, interior decoration and garden display purposes (Lepcha et al., 2007). Gladiolus has the basic chromosome number n=15. Most member of genus are heteroploids having the very small chromosomes ranging from 2n=30 to 120 (Singh et al., 2017). The spikes are used in vase arrangements, in bouquets and for indoor decorations (Swetha et al., 2020). For a modern and industrialized floriculture, there is always demand and necessity of new varieties.

Netherland ,USA, Columbia and Italy as leading growers and traders. Netherland continues to be the global master of floriculture trade with 43.7% of total world exports during 2018. India is the second largest flower growing country after China and is at 14th position in exporting floriculture products. In terms of domestic production, Chhattisgarh(115.36MT) is the leading state in gladiolus cultivation in India, followed by West Bengal(55.04MT), Uttar Pradesh(46.96), Assam(12.14MT), Karnataka(8.40MT),Madhya Pradesh(7.60MT)and other states with total production 259.54 thousand metric tonnes that during 2021-2022. (https://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?hscode=1031). The crop has wide range of varietal wealth which exhibits a huge range of variability. Genetic variation and genetic relationship among genotypes are an important consideration for classification and utilization of germplasm resources in breeding programmes (Kumar *et. al*., 2013). Its adaptability ensures its survival in diverse environmental conditions, making it a resilient and cherished addition to gardens worldwide. Moreover, the Gladiolus serves as a vital resource for breeders, empowering them to develop new cultivars with increased hardiness, disease resistance and aesthetic appeal. Present investigation was aimed to assess the performance of gladiolus varieties suitable for cut flower and corms production under Prayagraj condition.

2. Materials and Methods

The experiment was carried out in Randomized Block Design with three replications in the department research field, Department of Horticulture, Sam Higginbottom University of Agricultural, Technology and Sciences, Prayagraj during October 2022 to March 2023. Fifteen different varieties *viz.*,Red Megistae, Arka Amar, Chandni, Joshka, Priscilla, Dhanvantri, Pusa Suhagin, Pv Down, Yellow Stone , Sovic Biscuits , Arka Pratham, Red

Ginger , Gunjan, Cheops, Arka Naveen were used for the study. The experimental field was thoroughly ploughed and brought into fine tilth.The entire experimental land was divided into subplots measuring 1.0 m x 1.0 m and there were totally 45 plots. Bavistin (3g/litre) treated corms were planted on the ridges to a depth of 6-7 cm by adopting a spacing of 30 x 20 cm. Five randomly selected competitive plants from each replication were used for recording twenty three quantitative traits.

The observations were recorded on quantitative characters selected for genetic variability studies such as Plant height at 30DAS (cm), Plant height at 60DAS (cm), Plant height at 90DAS(cm), Number of leaves at 30DAS,Number of leaves at 60DAS, Number of leaves at 90DAS, Number of shoot per plant, Days taken for 50% sprouting, Days to first flowering, Rachis length(cm), Number of days for emergence of flower spike, Days to show color of basal floret, Number of florets per spike, Number of spikes per plant, Floret length(cm), Floret diameter(cm), Number of corms per plant, Corm diameter(cm), Weight of corms(g), Cormel diameter(cm), Number of corms/hectare, Number of cormels/hectare and Yield of corms/plant(g).

3. Results and Discussions

Analysis of variance revealed significant differences for most of the traits under study implying that there is substantial variability among the 15 genotypes and thereby ample scope of selection of promising lines of Gladious Significant differences were also observed for Number of corms per hectare, Number of cormels per hectare, Plant height at 30DAS , Rachis length ,Plant height at 60DAS. The mean sum of squares due to genotype for different characters are presented in Table 1.

Mean Performance of Different varieties

The mean values, range, grand mean and critical difference of 15 gladiolus genotypes for all the 23 growth, flowering and corm yield characters are presented in (Table 2)

Plant height (cm) at 30 DAS ranged from 40.49 to 61.33 with the mean of 48.84, the plant height (cm) at 60 DAS ranged from 58.63 to 93.07 with a mean of 73.17, Plant height (cm) at 90 DAS ranged from 88 to 118.46 with a mean of 104.54, Plant leave at 30 DAS ranged from 2.05 to 12.10 with a mean of 7.03 , Plant leave at 60 DAS ranged of variation from 6.12 to 14.56 with a mean of 10.39, Plant leave at 90 DAS ranged of variation from 14.34 to 21.22 with a mean of 18.10 .Number of shoot/plant ranged of variation from 1.01 to 2.20 with a mean of 1.53.

Days for 50% flowering exhibited ranged of variation from 5.00 to 7.32 with a mean of 6.21,Days to first flowering ranged of variation from 9.63 to 18.00 with mean of 13.59, Rachis length (cm) ranged of variation from 48.99 to 80.25 with a mean of 64.02, Number of days for emergence of flower spike ranged from78.32 to 92.64 with mean 86.57, Number of florets per spike ranged from 10.78 to 10.06 with a mean 14.26, Number of spikes ranged from 1.00 to 2.17 with a mean 1.48, Floret length ranged from 8.94 to 11.85 with a mean 10.24, Floret Diameter ranged from 8.05 to 10.76 with a mean 9.38.

Number of corms produced per plant ranged from 1.05 to 2.61 with a mean 1.68, Corm diameter ranged from 3.34 to 6.46 with a mean 5.29, Weight of corm ranged from 34.23 to 60.00 with a mean 44.44, Cormel diameter ranged from 0.30 to 2.40 with a mean 1.51. Number of corms per hectare ranged from 174999 to 434998 with a mean 279331.67,Number of cormels per hectare ranged from 1856310 to 7147000 with a mean 4004533, The maximum corm yield per plant was recorded in Yellow stone(156.2g) followed by Joshka(130.02g) ,Pusa suhagan(123.22g) and corm yield per plant ranged from 39.2 to 156.2 with a mean 77.91.Similar results reported by Sharma et al., (2018), Singh and Singh (2018), Kumar et al., (2019) and Swetha et al., (2020).

Genetic parameters for different characters in different gladiolus varieties

Pratap and Rao(2006) reported PCV was found to be greater than GCV for most of the characters. The high value of PCV along with GCV indicated that there is more variability in characters. Which suggest effect of environment on the expression of the traits studied . Phenotypic and genotypic variance, phenotypic and genotypic coefficient of variance for all characters were calculated (Singh and Chaudhary 1979). Genetic advance were calculated as suggested by Johnson *et al*.(1995).Simple correlation coefficient pertaining to the phenotype and genotype for characters were computed (Singh and Chaudhary 1979).

High estimates of PCV and GCV was recorded for Number of leaves 30DAS(52.70 and 52.92), Corm yield/plant(39.12 and 46.61), Number of cormels/hectare(39.12 and 39.34), Cormel diameter(38.36 and 38.62), Number of corms/hectare(28.97 and 29.30), Number of corms per plant(28.97 and 29.29),Number of leaves at 60DAS(26.64 and 27.00), Number of shoot(26.64 and 12.49).

While as moderate estimate was observed for Days to first flowering (18.83 and 19.20), Corm diameter(18.64 and 18.99), Weight of corm(17.21 and 17.84),Rachis length (16.70 and 17.04), Plant height at 30DAS(12.00 and 12.70),Number of leaves at 90DAS (11.73 and

12.49), Number of florets per spike (11.61 and 12.20), Days taken 50% flowering(10.71 and 11.47),Floret diameter (10.35 and 11.02), Plant height at 60DAS(10.20 and 10.89).

Whereas low estimates was observed for Floret length(8.95 and 9.83) , Plant height at 90DAS(6.85 and 8.00), Number of days for emergence of flower spike(5.54 and 6.76) , Days to show color of basal floret(4.34 and 5.79).

Heritability-The high heritability in broad sense was observed for the characters viz Corms yield/ plant (99.20), Number of leaves (99.10), Number of cormels/ hectare(99), Cormel diameter(98.62), Number of corms/plant(97.87), Number of shoot per plant(97.78), Number of leaves 60DAS(97.35), Number of spike per plant(97.03), Corm diameter(96.40) , Days to first flowering(96.21), Rachis length (96.11), Weight of corm(93.06), Number of florets per spike(90.57) , Plant height at 30DAS (89.28), Floret diameter(88.23), Number of leaves(88.23), Plant height at 60DAS (87.80), Floret length (82.90). While as moderate estimates was observed Plant height at 90DAS(73.32) , Number of days of emergence of flower spike(67.29), Days to show color of basal floret(56.29). While none of traits had exhibited lowest heritability. The present findings are in accordance with the findings of Anuradha and Gowda (1990), Sorianatha sundaram and Nambisan (1991), Mahanta and Paswan (1995), Sheikh *et al*., (1995), Balaram *et al*., (2000), Deepti (2000), Balamurugan *et al*., (2002), Bichoo *et al*., (2002), and Pratap and Rao (2006), Balaram and Janakiram (2009), Bhujbal *et al*.,(2013), Archana *et al*., (2008), Choudhary *et al*., (2012), Naresh *et al*., (2015), Singh *et al*., (2017) and Vanlalruati *et al*.,(2013)

Table 1-The treatments included fifteen cultivars of Gladiolus

S.No.	Notation	Genotypes	Source
1.	V1	Red megistae	DFR, Pune
2.	V2	Arka Amar	DFR, Pune
3.	V3	Chandni	DFR, Pune
4.	V4	Joshka	DFR, Pune
5.	V5	Priscilla	DFR, Pune
6.	V6	Dhanvantri	DFR, Pune
7.	V7	Pusa Suhagan	DFR, Pune
8.	V8	Pv Dawn	DFR, Pune
9.	V9	Yellow Stone	DFR, Pune
10.	V10	Sovic biscuits	DFR, Pune
11.	V11	Arka Pratham	DFR, Pune
12.	V12	Red ginger	DFR, Pune
13.	V13	Gunjan	DFR, Pune
14.	V14	Cheops	DFR, Pune

15.	V15	Arka Naveen	DFR, Pune

Table 2 Mean performance of 15 genotypes for growth, flowering and corms yield characters of Gladiolus (*Gladiolus grandiflorus L)*

S.No	Genotype	Plant height cm (30 days)	Plant height cm (60 days)	Plant height cm (90 days)	Number of leaves (30 das)	Number of leaves (60 das)	Number of eaves (90 das)	No. of shoot per plant	Days taken for 50% sprouting	Days to first flowering	Rachis length (cm)	No. of days for emergence of flower spike	days to show colour of basal floret
1	Red megistae	46.95	69.5	104.66	7.15	10.4	18.02	1.46	6.00	14.21	67.84	74.08	80.83
2	Arka amar	48.54	68.27	101.00	11.95	14.2	20.25	1.39	6.82	14.00	65.85	76.40	84.74
3	Chandni	42.45	64.52	99.08	2.45	7.45	15.70	1.09	6.32	17.15	51.63	82.71	92.65
4	Joshka	54.62	76.01	118.57	11.95	14.20	20.10	2.11	5.65	15.66	78.65	72.84	82.97
5	Priscilla	44.89	75.73	102.37	3.40	7.67	16.34	1.19	6.55	9.63	52.70	80.48	88.68
6	Dhanvantri	45.79	69.50	104.66	6.67	9.32	17.90	1.50	6.00	18.00	56.12	80.24	87.92
7	Pusa suhagan	58.90	78.38	114.93	8.23	10.59	18.33	2.17	5.72	11.33	79.22	79.23	89.21
8	Pv down	42.72	72.19	106.83	10.04	13.08	20.1	1.56	6.13	14.27	68.40	82.64	88.54
9	Yellow stone	61.33	93.07	118.46	11.59	13.89	21.22	2.20	5.00	12.33	80.25	67.47	78.32
10	Sovic biscuits	42.45	64.52	94.58	9.86	12.35	19.72	1.03	7.05	10.00	59.25	81.70	90.78
11	Arka pratham	40.49	58.63	88	3.85	8.40	16.58	1.25	7.00	12.00	49.43	79.69	88.27
12	Red ginger	42.72	68.27	99.08	4.62	9.11	17.67	1.33	6.50	12.27	62.45	83.22	85.32
13	Gunjan	52.23	74.80	107.54	2.2	7.15	15.04	1.01	7.32	11.66	48.99	77.04	92.64
14	Cheops	42.72	71.49	104.47	9.36	11.55	19.22	1.71	5.90	14.33	68.59	79.56	82.45
15	Arka naveen	51.03	79.38	111.00	2.05	6.12	14.34	1.89	5.15	17.00	70.93	71.33	85.24
	Mean	**48.84**	**73.17**	**104.54**	**7.03**	**10.39**	**18.10**	**1.53**	**6.21**	**13.59**	**64.02**	**77.91**	**86.57**
	Min	40.49	58.63	88.00	2.05	6.12	14.35	1.01	5.00	9.63	48.99	67.47	78.32
	Max	61.33	93.07	118.46	12.10	14.56	21.22	2.20	7.32	18.00	80.25	83.22	92.65
	SE(d)	1.66	2.27	3.53	0.27	0.37	0.63	0.05	0.21	0.42	1.76	2.46	2.71
	C.D. at 5%	3.41	4.68	7.26	0.56	0.77	1.30	0.10	0.43	0.85	3.62	5.06	5.57
	C.V.	4.16	3.80	4.13	4.74	4.40	4.28	4.01	4.12	3.74	3.36	3.86	3.83

Table 3 Mean performance of 15 genotypes for growth, flowering and corms yield characters of Gladiolus (*Gladiolus grandiflorus L.*)

S.No	Genotype	No. Of florets per spike	Number of spikes per plant	Floret length	Floret diameter	No. of corms per plant	Corm diamter cm	Weight of corm (gm)	Cormel diameter (cm)	No. Of corms / hectare	Number of cormels /hectare	Corms yield/plant (g)
1	Red megistae	14.27	1.44	11.25	10.50	1.67	5.20	44.33	1.27	278332	4188450	74.03
2	Arka amar	13.47	1.35	9.60	9.12	1.52	5.55	43.00	2.13	253332	3759000	65.36
3	Chandni	13.67	1.07	9.45	8.46	1.27	4.66	36.45	1.43	211665	2684520	46.29
4	Joshka	15.60	2.10	10.59	9.90	2.40	5.91	54.25	1.60	399998	6195000	130.02
5	Priscilla	13.80	1.15	9.94	8.95	1.33	6.13	38.29	1.90	221665	2695350	50.92
6	Dhanvantri	14.47	1.45	11.78	10.54	1.66	5.27	42.85	1.80	276665	4111070	71.13
7	Pusa suhagan	15.67	2.11	10.25	9.57	2.34	5.67	52.66	2.30	389998	6146350	123.22
8	Pv down	12.60	1.50	10.51	9.80	1.89	6.16	51.10	0.57	314998	4252500	96.57
9	Yellow stone	17.06	2.17	11.85	10.76	2.61	6.46	60.00	0.40	434998	7147000	156.60
10	Sovic biscuits	14.89	1.01	9.12	8.20	1.09	3.90	35.97	1.77	181665	2371950	39.20
11	Arka pratham	12.59	1.23	9.13	8.25	1.05	3.57	34.23	1.47	174999	1856310	35.94
12	Red ginger	13.07	1.32	9.57	8.52	1.12	3.34	35.00	1.20	186665	2074100	39.20
13	Gunjan	10.78	1.00	8.94	8.05	1.50	5.41	43.66	0.93	249999	3685296	65.49
14	Cheops	15.23	1.60	10.65	10.01	1.83	6.10	47.03	1.50	304998	4235600	86.06
15	Arka naveen	16.80	1.75	10.91	10.11	1.86	6.07	47.66	2.40	309998	4665500	88.64
	Mean	**14.26**	**1.48**	**10.24**	**9.44**	**1.68**	**5.29**	**44.43**	**1.51**	**279332**	**4004533**	**77.91**
	Min	10.78	1.00	8.94	8.05	1.05	3.34	34.23	0.40	174999	1856310	35.94
	Max	17.06	2.17	11.85	10.91	2.61	6.46	60.00	2.40	434998	7147000	156.60
	SE(d)	0.44	0.06	0.34	0.29	0.06	0.16	1.71	0.06	9975	136013	2.82
	C.D. at 5%	0.90	0.12	0.70	0.60	0.12	0.32	3.51	0.12	20539	280048	5.80
	C.V.	3.75	4.62	4.06	3.78	4.29	3.60	4.70	4.55	4.37	4.16	4.43

Table 4. Estimation of component of variance and genetic parameters for 23 character growth, flowering and corm yield of 15 genotypes in Gladiolus

Characters	Mean	Min	Man	var (g)	var (p)	Heritability (%)	GA	GA% mean	GCV (%)	PCV (%)
Plant height cm (30 days)	48.84	40.49	61.33	34.34	38.46	89.28	11.41	23.35	12.00	12.70
Plant height cm (60 days)	73.17	58.63	93.07	55.72	63.46	87.80	14.41	19.69	10.20	10.89
Plant height cm (90 days)	104.54	88.00	118.46	51.25	69.91	73.32	12.63	12.08	6.85	8.00
Number of leaves (30 das)	7.03	2.05	12.10	13.75	13.86	99.20	7.61	108.13	52.70	52.92
Number of leaves (60 das)	10.39	6.12	14.56	7.66	7.87	97.35	5.63	54.15	26.64	27.00
Number of leaves (90 das)	18.10	14.35	21.22	4.51	5.11	88.23	4.11	22.70	11.73	12.49
No. of shoot per plant	1.53	1.01	2.20	0.17	0.17	97.78	0.83	54.26	26.64	26.94
Days taken for 50% sprouting	6.21	5.00	7.32	0.44	0.51	87.10	1.28	20.58	10.71	11.47
Days to first flowering	13.59	9.63	18.00	6.55	6.81	96.21	5.17	38.05	18.83	19.20
Rachis length (cm)	64.02	48.99	80.25	114.34	118.96	96.11	21.59	33.73	16.70	17.04
No. Of days for emergence of flower spike	77.91	67.47	83.22	18.64	27.71	67.29	7.30	9.37	5.54	6.76
days to show colour of basal floret	86.57	78.32	92.65	14.14	25.11	56.29	5.81	6.71	4.34	5.79
No. Of florets per spike	14.26	10.78	17.06	2.74	3.03	90.57	3.25	22.75	11.61	12.20
Number of spikes per plant	1.48	1.00	2.17	0.15	0.16	97.03	0.80	53.72	26.47	26.87
Floret length	10.24	8.94	11.85	0.84	1.01	82.90	1.72	16.78	8.95	9.83
Floret diameter	9.44	8.05	10.91	0.95	1.08	88.23	1.89	20.03	10.35	11.02
No. of corms per plant	1.68	1.05	2.61	0.24	0.24	97.87	0.99	59.05	28.97	29.29
Corm diamter cm	5.29	3.34	6.46	0.97	1.01	96.40	2.00	37.71	18.64	18.99
Weight of corm(gm)	44.43	34.23	60.00	58.50	62.86	93.06	15.20	34.21	17.21	17.84
Cormel diameter(cm)	1.51	0.40	2.40	0.34	0.34	98.62	1.19	78.46	38.36	38.62
No. Of corms / hectare	279332	174999	434998	6548146153	6697406742	98	164828	59.01	28.97	29.30
Number of cormels /hectare	4004533	1856310	7147000	2453812976576	2481562436637	99	3208825	80.13	39.12	39.34
Corms yield/plant(g)	77.91	35.94	156.60	1307	1319	99.10	74.13	95.15	46.40	46.61

Genetic advance estimates were found to be high for number of cormels/hectare (3208825), Number of corms/hectare(164828) . Whereas moderate estimate observed for Rachis length(21.59), Weight of corm(15.20), Plant height at 60DAS(14.41) , Plant heigth at 90DAS(12.63), Plant height at 30DAS(11.41). Low estimates observed for Number of leaves 30DAS (7.61), Number of leaves 60DAS(5.63), Number of leaves at 90DAS(4.11) described in Table 4.Similar result were observed in Pratap and Rao(2006) in gladiolus

Genotypic correlation coefficient analysis revealed that Corms yield/plant (g) showed positive significant association with Number of leaves at 30DAS(0.897**), Number of leaves at 60DAS(0.893**), Number of leaves90DAS(0.852**), Number of shoot per plant(0.918**), Days to first flowering(0.854**), Rachis length(0.860**), No. Of florets per spike(0.638**) ,Number of spikes per plant(0.923**), Floret length(0.950**) ,Floret diameter(0.872**), No. of corms per plant(0.998**), Corm diameter(0.819**), Weight of corm(0.994**),Number of corms per hectare(0.995**), Number of cormels per hectare(0.990**).

Phenotypic correlation coefficient analysis revealed that Corms yield/plant (g) showed positive significant association Number of leaves at 30DAS(0.885**), Number of leaves at 60DAS(0.876**), Number of leaves90DAS(0.799**), Number of shoot per plant(0.898**), Days to first flowering(0.826**), Rachis length(0.835**), No. Of florets per spike(0.597**) ,Number of spikes per plant(0.915**), Floret length(0.852**) ,Floret diameter(0.819**), No. of corms per plant(0.985**), Corm diameter(0.800**), Weight of corm(0.969**),Number of corms per hectare(0.990**), Number of cormels per hectare(0.972**).

Conclusion

It is concluded that high magnitude of heritability in broad sense coupled with high genetic advance were observed for most of traits . It was observed that PCV was higher than GCV for all the traits studied and high magnitude of GCV and PCV were recorded for characters like number of leaves at 30DAS ,Corm yield/plant, Number of cormels/hectare, cormel diameter, Number of corm/hectare, Number of corms/plant.

The genotypic and phenotypic correlation coefficient analysis revealed that that Corms yield/plant (g) showed positive significant association with Number of leaves at 30DAS, Number of leaves at 60DAS, Number of leaves90DAS, Number of shoot per plant, Days to first flowering, Rachis length, No. Of florets per spike, Number of spikes per plant, Floret length ,Floret diameter, No. of corms per plant, Corm diameter, Weight of corm, Number of

corms per hectare, Number of cormels per hectare. The genotypes Yellow stone followed by Joshka, Pusa suhagan, Arka Naveen produced higher spike yield per plot which is indicated that these genotypes may be shown for higher yield and indicated good response to selection owing to their high heritability, variability and genetic advance showing additive gene effect. These genotypes can be used for improvement of yield and components traits by selection.

References

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