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Study on Phenotypic Path Coefficient in Dahlia

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ABSTRACT
Dahlia is an importance bulbous flower crop which has position to increase economic earning of grower. Forty varieties were grown and studied for phenotypic path correlation of traits at C.S. Azad University of Agriculture and Technology, Kanpur, during 2011-12 and 2012-13. Vegetative and reproductive characters parameters were found to have considerable relationship which also indicated the scope for making improvement in dahlia. Plant height and maximum number of flower per head revealed the sustainable magnitude for crop improvement in dahlia crop.
Keywords: *Species, Varieties, Germplasm, Dahlia*

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INTRODUCTION

It is a known fact that popularity of floricultural plants is increasing day by day to its growth and development performance. Standard quality of flowers production is a long felt need for making improvement leading to earn maximum price in markets. In our country flower plants cultivation is being considered a sophisticated lucrative business in the field of horticulture. In fact all the present day colorful flowering plants are the result of extensive hybridization and spontaneous research work carried out by the scientists engaged in this field [1, 2, 11, 5].

Now-a-days floriculture is thought a profitable venture [7]. India is exporting flowers and earning foreign exchange but it is not up to a great extent. The climatic conditions of this country are the best assets for producing desirable quality flowers which will fetch a handsome amount of profit in our markets and abroad. A considerable export potential has been emphasized in this field [13].

Seeing the future as a potential of export for flower production, floriculture as an industry has been considered by the authorities [3, 4, 6].

Several flower crops namely Rose, Gladiolus, Orchids, Carnation, Chrysanthemum etc. are grown and exported to different countries. Floriculture export industry is considered a diversified field for earning [5].

Due to this view there is an increasing demand for flowers in the national and international markets [13]. With this fact the escape and area of floriculture industry has been increasing in the country day by day [6]. In a large scale flowers are used for producing several being of products name performs, medicine oils etc perfects. Flowers also used to give the best colour and beauty effect in decoration and fragrance in atmosphere in certain occasions. In a broad sense among flowering plants bulbous plants are very much valued and have a special status in the word of flowers [8, 9, 5].

Corporate and entrepreneurs are also engaged in the flower production and export industry [6, 12]. In present era, commercial flower growing has become an integral part of Indian Agriculture [10, 5].

MATERIAL AND METHODS

Present investigation was carried out during the year 2011-12 and 2012-13 at C.S. Azad University of Agriculture and Technology, Kanpur. The experiment material consist 40 standard dahlia genotypes. The experiment was laid out in Randomized Block Design with three replications. All the recommended

cultural practices were followed to grow the successful crop. The data collected was statistically analyzed. The genetic diversity among the genotypes was worked out using Mahalanobis D2 statistics. Tubers of screened and selected varieties were taken as basic material for planting in the trials. Healthy tubers were planted in proper layout in the field.

RESULTS AND DISCUSSION

It is apparent from the data summarized in tables 1 and 2 that the numbers of days for sprouting of tubers gave direct and indirect effect during both the years of investigations. Days required for tuber sprouting showed positive effect with plant height (0.0010), Length of branch (0.0376), days for emergence of bud (0.0037), length of flower bud (0.0129), diameter of flower (0.0148), number of flowers per head (0.0972), diameter of tuber (0.0095) and weight of tuber (0.0143). Similarly and direct response to length of branch (0.0340), length of leaf (0.0060), days for bud emergence (0.0050), days for bud maturity (0.0117), diameter of flower (0.0112), numbers of flower per head (0.0360), length and diameter of tuber during the 2011-12. A perusal of the data of other characters also revealed positive and direct effect with number flowers plant. On the other had some aspects showed negative response to number of flowers per plant in the investigation of 2011 - 2012.

Research perusal of data of second year revealed positive and direct effect on the number of flowers per plant. Sprouting period of tubers showed positive effect on plant height (0.0819), length of branch (0.0270), length of leaf (0.0243), days for bud emergence (0.0037), diameter of flower (0.0076), number of flowers per head, length of tuber (0.0038) and diameter of tuber (0.0018). In the year 2012-13 plant height also showed negative response to some character in the data of the above tables.

Table 1: Phenotypic Path coefficient analysis of number of flower Vs other Characters (2011-12).

Sr. No.	Characters	Sprouting of tuber	Plant height	No. of branches/ plant	Length of branch	No. of eaves/ plant	Length of leaf	Diameter of leaf stalk	Days for bud emergence
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Sprouting of Tuber	0.1767	0.0010	-0.0088	0.0376	-0.0029	-0.0317	-0.0059	0.0037
2	Plant height	0.0024	0.0733	-0.0037	0.0340	-0.0267	0.0060	-0.0059	0.0050
3	No. of branches/ plant	0.0678	0.0119	-0.0228	0.1201	-0.0179	-0.0780	-0.0657	0.0036
4	Length of branch	0.0335	0.0126	-0.0138	0.1980	-0.0236	-0.0886	-0.0830	-0.0007
5	No. of leaves/plant	0.0092	0.0348	-0.0073	0.0831	-0.0562	-0.0296	-0.0470	0.0020
6	Length of leaf	-0.0339	0.0026	0.0108	-0.1063	0.0101	0.1651	0.0651	-0.0037
7	Diameter of leaf stalk	0.0057	0.0049	0.0082	0.0900	-0.0145	-0.0588	-0.1826	-0.0021
8	Days for bud emergence	-0.0382	-0.0216	0.0048	0.0086	0.0066	0.0364	-0.0223	-0.0169
9	Days for bud maturity	-0.0247	0.0133	-0.0003	0.0289	-0.0191	-0.0006	-0.0459	-0.0012
10	Length of Flower bud	0.0082	-0.0036	-0.0039	0.0576	0.0048	-0.0142	-0.0437	-0.0019
11	Diameter of flower	0.0412	0.0130	-0.0050	0.0529	0.0041	-0.0243	0.0029	0.0017
12	No. of flowers/head	0.0382	0.0060	-0.0114	0.1129	-0.0102	-0.0738	-0.0488	-0.0025
13	Length of tuber	-0.0424	0.0035	0.0079	-0.0801	0.0082	0.0756	0.0651	0.0003
14	Diameter of tuber	0.0239	0.0224	-0.0075	0.0360	-0.0035	-0.034	-0.0139	0.0010
15	Weight of tuber	0.0474	0.157	-0.0068	0.0494	-0.0129	-0.0257	-0.0333	-0.0004

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Sr. No.	Characters	Days for bud maturity	Length of Flower bud	Dia. of Flower	No. of Flowers per Head	Length of Tuber	Diameter of Tuber	Weight of tuber	Phenotypic correlation with no. of flowers per plant
		9	10	11	12	13	14	15	16
1	Sprouting of Tuber	-0.0117	0.0129	0.0148	0.0972	-0.0046	0.0095	0.0143	0.3020
2	Plant height	0.0152	-0.0134	0.0112	0.0366	0.0009	0.0215	0.0114	0.1617
3	No. of branches/ plant	0.0009	0.0477	0.0138	0.2239	-0.0067	0.0230	0.0160	0.3375
4	Length of branch	0.0122	0.0805	0.0169	0.2563	-0.0078	0.0128	0.0133	0.4188
5	No. of leaves/plant	0.0285	-0.0236	-0.0046	0.0813	-0.0028	0.0044	0.0123	0.0845
6	Length of leaf	-0.0003	0.0138	-0.0093	-0.2009	0.0089	-0.0168	-0.0083	-0.1410
7	Diameter of leaf stalk	0.0211	0.0663	-0.0010	0.1202	-0.0069	0.0054	0.0097	0.0493
8	Days for bud emergence	0.0058	0.0319	-0.0065	0.0656	-0.0003	-0.0043	-0.0013	0.0509
9	Days for bud maturity	0.0840	-0.0412	-0.0043	0.0216	-0.0012	-0.0134	-0.0027	-0.0068
10	Length of Flower bud	-0.0125	0.2766	0.0141	0.0956	-0.0010	0.0053	0.0126	0.3977
11	Diameter of flower	-0.0057	0.0617	0.0634	0.2471	-0.0030	0.0082	0.0089	0.4671
12	No. of flowers/head	0.0040	0.0589	0.0349	0.4495	-0.0063	0.0170	0.0145	0.5829
13	Length of tuber	-0.0054	-0.0139	-0.0099	-0.1462	0.0193	0.0079	0.0174	-0.0926
14	Diameter of tuber	-0.0160	0.0210	0.0073	0.1086	0.0022	0.0704	0.0239	0.2365
15	Weight of tuber	-0.0043	0.0840	0.0105	0.1218	0.0063	0.0316	0.0534	0.3366

Table 2: Phenotypic Path coefficient analysis of number of flower Vs other characters (2012-13).

Sr. No.	Characters	Sprouting of tuber	Plant height	No. of branches/ plant	Length of branch	No. of leaves/ plant	Length of leaf	Diameter of leaf stalk	Days for bud emergence
		1	2	3	4	5	6	7	8
1	Sprouting of Tuber	0.0024	0.0009	0.0006	-0.0991	0.0152	0.0000	0.0677	0.0128
2	Plant height	0.0000	0.0814	-0.0015	0.0270	-0.0242	-0.002	0.0231	0.0152
3	No. of branches/ plant	-0.0001	0.0080	-0.0153	0.2431	-0.0385	0.0010	0.0893	0.0051
4	Length of branch	-0.0066	0.0051	-0.0087	0.4285	-0.0315	0.0008	-0.1426	-0.0004
5	No. of leaves/plant	0.0003	0.0184	-0.0055	0.1255	-0.1073	0.0004	-0.0472	0.0071
6	Length of leaf	0.0000	0.0057	0.0051	-0.1181	0.0130	-0.0030	0.0376	0.0142
7	Diameter of leaf stalk	-0.0007	-0.0076	-0.0055	0.2473	-0.0205	0.0004	-0.2470	0.0044
8	Days for bud emergence	-0.0007	-0.0282	0.0018	0.0016	0.0173	-0.0010	0.0248	-0.0438
9	Days for bud maturity	0.0002	-0.0177	0.0011	-0.0593	0.0206	-0.0006	0.0664	-0.194
10	Length of Flower bud	0.0001	-0.0012	0.0007	0.0192	-0.0000	0.0006	-0.0320	0.0132
11	Diameter of flower	0.0000	0.0301	-0.0007	0.0630	0.0146	0.0008	-0.0405	0.0118
12	No. of flowers/head	0.0001	0.0102	-0.0059	0.2405	-0.0108	0.0008	0.0880	-0.0005
13	Length of tuber	0.0009	0.0092	0.0013	-0.1753	-0.0211	-0.0004	0.0591	0.0036
14	Diameter of tuber	0.0001	0.0344	-0.0001	0.0614	-0.0017	-0.0001	0.0010	0.0010
15	Weight of tuber	0.0001	0.0036	-0.0053	0.1402	-0.0327	0.0002	-0.0544	-0.0067

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Sr. No.	Characters	Days for bud maturity	Length of Flower bud	Dia. of Flower	No. of Flowers per Head	Length of Tuber	Diameter of Tuber	Weight of tuber	Phenotypic correlation with no. of flowers/plant
		9	10	11	12	13	14	15	16
1	Sprouting of Tuber	-0.0200	0.0039	0.0020	0.0076	0.0038	0.0018	-0.0059	0.2967
2	Plant height	0.0432	-0.0014	0.0681	0.0308	0.0103	0.0304	-0.0059	0.2967
3	No. of branches/ plant	0.0140	-0.0046	0.0076	0.0952	-0.0077	0.0004	0.0461	0.2651
4	Length of branch	0.0274	0.0043	0.0271	0.1379	-0.0379	0.0103	0.0434	0.4638
5	No. of leaves/plant	0.0381	0.0000	0.0251	0.0246	0.0181	0.0011	0.0404	0.0882
6	Length of leaf	-0.0436	-0.0213	-0.0472	-0.0704	0.0110	0.0015	-0.0105	-0.2657
7	Diameter of leaf stalk	0.0534	0.0125	0.0302	0.0875	-0.0219	-0.0003	0.0292	0.1616
8	Days for bud emergence	-0.0878	-0.0292	-0.0495	0.0027	-0.0076	0.0016	0.0202	-0.1792
9	Days for bud maturity	0.1984	-0.0062	-0.0323	-0.0094	0.0072	0.0028	0.0343	-0.2107
10	Length of Flower bud	0.0127	0.0968	0.0484	0.0247	0.0142	0.0136	-0.0040	0.1515
11	Diameter of flower	0.0348	0.0254	0.1842	0.1155	-0.0048	0.0145	-0.0061	0.04426
12	No. of flowers/head	0.0076	0.0097	0.0866	0.2457	-0.0254	0.0142	0.0461	0.5309
13	Length of tuber	0.0155	-0.0150	-0.0097	-0.0681	0.0917	0.0077	0.0180	-0.1146
14	Diameter of tuber	-0.0076	-0.0183	0.0372	0.0485	0.0098	0.0719	0.0440	0.2815
15	Weight of tuber	-0.0513	-0.0029	-0.0085	0.0853	0.0124	0.0239	0.1326	0.2293

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