



RESEARCH ARTICLE

STUDY ON ENVIRONMENTAL CORRELATION COEFFICIENT IN DAHLIA GERMPLASM

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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 genotypic 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.

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INTRODUCTION

Dahlia is one of the important bulbous flowering crops and its flowers are used for various purposes of decoration. It belongs to the family compositeae. Dahlia has a large group of beautiful striking colours – bi-colours and multicoloured cultivars (Basu and Bose, 1970). Due to its qualities, it is advocated as a flower of glamour and perforation. It provides inner enjoyment and feelings to human beings. Among the flowers it has own rank and standing in India and abroad. Its varieties have considerable importance and scope in economic field. In recent years dahlia farming along with other flowers has picked up very well both in the hills and plains. Its flowers of giant decorative, large decorative, medium decorative, small decorative, pompan and cactus types are grown in Uttar Pradesh, Delhi, Rajasthan, Punjab, Tamil Nadu, Himanchal Pradesh, Gujarat, Karnataka, Andhra Pradesh, Sikkim, Madhya Pradesh, Kolkata, Orissa, Assam, States and North Eastern Hill regions in sporadic cultivation. In some Institutions, Universities and National/ Regional Centers/Research complex etc. grow it for different purposes.

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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. 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

Data of the environmental correlation coefficient have been presented in Tables1 and 2. It is evident from the data of the Tables1 and 2 that environmental correlation showed an important association of different characters. Data of the first year experiment revealed that tuber sprouting for raising the seedling plants had positive correlation with plant height (0.0170), number of branches per plant (0.1294), length of leaf (0.0606), days required for bud emergence (0.0294), days for bud maturity (0.1418), length of flower bud (0.1083), number of flowers/per plant (0.0897), Diameter of flower (0.0531) and diameter of tuber (0.1576) characters during 2011-12.

Table 1. Environmental correlation coefficient in Dahlia for 16 characters (2011-12)

Sl. No.	Characters	Days for Tuber sprouting	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	Days for Tuber sprouting	1.0000	0.0170	0.1294	-0.1163	-0.2035	0.0606	-0.0164	0.0294
2	Plant height	0.0170	1.0000	0.1144	0.0765	0.2706	0.1210	-0.1901	-0.1565
3	No. of branches/ plant	0.1294	0.1144	1.0000	-0.0773	-0.0185	0.1428	-0.1671	0.0750
4	Length of branch	0.1163	0.0765	-0.0773	1.0000	0.2309	-0.3738*	0.0156	-0.1147
5	No. of leaves/plant	-0.2035	0.2706	-0.0185	0.2309	1.0000	-0.2681	0.0086	-0.2495
6	Length of leaf	0.0606	0.1210	0.1428	-0.3738*	-0.2681	1.0000	-0.0636	0.1897
7	Diameter of leaf stalk	0.0164	-0.1901	-0.1671	0.0156	0.0086	-0.0636	1.0000	-0.0213
8	Days for bud emergence	0.0294	-0.1565	0.0750	-0.1147	-0.2495	0.1897	-0.0213	1.0000
9	Days for bud maturity	0.4118**	-0.0650	-0.0881	-0.1082	0.1307	-0.0307	-0.0302	0.0831
10	Length of Flower bud	0.1083	0.0741	-0.1080	0.0609	-0.1033	-0.2216	0.1811	-0.2127
11	No. of flowers/plant	0.0897	-0.0834	0.0682	-0.0348	-0.0153	0.0228	0.1751	0.2633
12	Diameter of flower	0.0531	0.1092	-0.0863	0.1589	0.2947	-0.1378	-0.0068	-0.1935
13	No. of flowers/head	-0.0861	-0.1542	0.1096	-0.0676	-0.0572	-0.1506	-0.1901	-0.0397
14	No. of tubers/plant	-0.1901	-0.0082	-0.2490	0.3062*	-0.0257	-0.0119	-0.1070	-0.1009
15	Diameter of tuber	0.1576	-0.1859	0.1785	0.0449	0.02561	-0.1322	-0.0215	-0.0281
16	Weight of tuber	-0.0615	0.0328*	0.0179	0.1354	0.1900	-0.0584	-0.0037	-0.0992

Sl. No.	Characters	Days for bud maturity	Length of Flower bud	No. of flowers/ plant	Diameter of flower	No. of flowers / head	No. of tubers/ plant	Diameter of tuber	Weight of tuber
		9	10	11	12	13	14	15	16
1	Days for Tuber sprouting	0.1418	0.1083	0.0897	0.0531	-0.0861	-0.1901	0.1576	-0.0615
2	Plant height	-0.0650	0.0741	-0.0834	0.1092	-0.1542	-0.0082	-0.1859	0.0328
3	No. of branches/ plant	-0.0881	-0.1080	0.0682	-0.0863	0.1096	-0.2490	0.1785	0.0179
4	Length of branch	-0.1082	0.0609	0.0348	0.1589	-0.0675	0.3062*	0.0449	0.1354
5	No. of leaves/plant	-0.1307	-0.0133	-0.0153	0.2947	-0.0572	-0.0257	0.2561	0.1900
6	Length of leaf	-0.0302	0.2216	0.0228	-0.1378	-0.1506	-0.0119	-0.1322	-0.0584
7	Diameter of leaf stalk	0.0831	0.1811	0.1751	-0.0068	-0.1901	-0.1070	-0.0215	-0.0037
8	Days for bud emergence	0.0942	-0.2127	0.2633	-0.1935	-0.0397	-0.1962	-0.0281	-0.0992
9	Days for bud maturity	1.0000	-0.1779	0.2190	-0.0522	-0.1762	0.1009	-0.1201	0.0447
10	Length of Flower bud	-0.1779	1.0000	-0.1175	0.1617	0.0320	-0.0609	0.0490	0.1275
11	No. of flowers/plant	0.2190	-0.1175	1.0000	-0.0560	-0.1202	-0.0439	-0.1022	-0.0714
12	Diameter of flower	-0.0522	0.1617	-0.0560	1.0000	0.0134	0.0249	0.0693	-0.0084
13	No. of flowers/head	-0.1762	0.0320	0.0134	-0.1202	1.0000	0.0668	0.0746	0.1116
14	No. of tubers/plant	-0.0609	-0.0439	0.0249	0.0668	-0.1962	1.0000	-0.1633	0.2041
15	Diameter of tuber	-0.1201	0.0490	-0.1022	0.0693	0.0746	-0.1633	1.0000	0.0470
16	Weight of tuber	0.0447	0.1275	-0.0714	-0.0084	-0.1116	0.2941	0.0470	1.0000

Table 2. Environmental correlation coefficient in Dahlia for 16 characters (2012-13)

Sl. No.	Characters	Days for Tuber sprouting	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	Days for Tuber sprouting	1.0000	0.0072	0.1819	-0.2089	-0.1568	-0.1483	-0.0928	-0.0665
2	Plant height	0.0072	1.0000	-0.0343	-0.2459	-0.0397	-0.0306	0.0862	-0.1580
3	No. of branches/ plant	0.1819	-0.0343	1.0000	0.0398	0.0004	0.1626	0.0992	-0.0652
4	Length of branch	-0.2089	-0.2459	0.0398	1.0000	0.1074	0.3126*	0.0916	-0.0482
5	No. of leaves/plant	-0.1568	0.0397	0.0004	0.1074	1.0000	0.1179	-0.0441	-0.2358
6	Length of leaf	-0.1493	-0.6306	0.1626	0.3126*	0.1179	1.0000	0.0000	0.0074
7	Diameter of leaf stalk	-0.0928	0.0862	0.0312	0.0916	-0.0441	0.0000	1.0000	-0.1809
8	Days for bud emergence	-0.0365	-0.1580	-0.0652	-0.0482	-0.2358	0.0074	-0.1809	1.0000
9	Days for bud maturity	0.1565	-0.1346	-0.0248	-0.0709	-0.0156	-0.0939	-0.1349	0.1061
10	Length of Flower bud	0.0319	0.0784	-0.1441	0.042	-0.0126	-0.0077	0.1729	-0.2212
11	No. of flowers/plant	-0.0677	0.1352	0.1045	0.1454	0.0620	0.1421	0.1158	0.0541
12	Diameter of flower	0.1004	-0.1148	0.0228	0.0813	0.0821	-0.2383	-0.1055	0.1510
13	No. of flowers/head	0.0620	0.1001	-0.2121	-0.1062	-0.0774	-0.2159	-0.1435	-0.0044
14	No. of tubers/plant	0.0456	0.0996	-0.1612	0.0096	-0.3357*	-0.1714	0.1204	0.0163
15	Diameter of tuber	0.1331	0.3116*	-0.0724	-0.0183	-0.1244	-0.0617	0.0616	-0.0176
16	Weight of tuber	-0.0393	0.0441	0.0577	-0.1230	0.1073	-0.0806	0.0418	0.1488

Similarly plant height aspect also revealed the positive correlation with number of branches/plant (0.1144), length of branch (0.0706), length of leaf (0.1210), days required for bud maturity (0.1418), length of flower bud (0.0741), diameter of flower (0.1092) and weight tuber (0.0328) characters in the investigations of 2011-12. Plant height character revealed positive correlation with diameter of leaf stalk (0.0862), length

of flower bud (0.784), number of flowers/plant (0.1352), number of flower/head (0.1001), number of tubers/plant (0.0996), diameter of tuber (0.3116) and weight of tuber (0.0441) aspects of the plant during the trial of 2012-13. Number of branches and length of branch characters also showed the positive correlation with length of leaf (0.1428) and diameter of leaf stalk (0.0176) during 2011-12,

Sl. No.	Characters	Days for bud maturity	Length of Flower bud	No. of flowers / plant	Diameter of flower	No. of flowers/ head	No. of tubers/ plant	Diameter of tuber	Weight of tuber
		9	10	11	12	13	14	15	16
1	Days for Tuber sprouting	-0.1565	0.0319	0.0677	0.1004	0.0620	-0.0456	0.1331	-0.0393*
2	Plant height	-0.1346	0.0784	0.1352	-0.1148	0.1001	0.0996	0.3116*	0.0441
3	No. of branches/ plant	-0.0248	-0.1441	0.1045	0.0228	0.2121	-0.1612	-0.0724	0.0577
4	Length of branch	-0.0709	0.0042	0.1454	-0.0813	-0.1062	0.0096	-0.0183	-0.1230
5	No. of leaves/plant	-0.0156	-0.0126	0.0620	0.0821	-0.0774	0.3357	-0.1244	0.1073
6	Length of leaf	-0.0939	-0.0077	0.1419	-0.2383	-0.2159	-0.1714	-0.0617	-0.0806
7	Diameter of leaf stalk	-0.1349	0.1729	0.1159	-0.1055	-0.1435	0.1204	-0.0616	0.0418
8	Days for bud emergence	0.1061	-0.2212	-0.0695	0.1510	-0.0044	0.0163	-0.0176	0.1488
9	Days for bud maturity	1.0000	0.1515	-0.1575	0.1834	-0.1237	0.0976	0.0130	0.0213
10	Length of Flower bud	-0.1515	1.0000	0.0203	-0.0055	0.1204	-0.0181	-0.0796	-0.0808
11	No. of flowers/plant	0.16321	-0.0203	1.0000	-0.1062	-0.2093	-0.0395	0.1575	0.0695
12	Diameter of flower	0.1834	0.0055	-0.1062	1.0000	0.0725	0.0153	0.0193	0.0668
13	No. of flowers/head	-0.1237	0.1204	-0.2093	0.0725	1.0000	-0.1352	-0.1154	0.0512
14	No. of tubers/plant	0.0976	0.0181	-0.0395	0.0153	-0.1552	1.0000	0.2084	0.0333
15	Diameter of tuber	0.0130	-0.0996	0.0550	0.0193	-0.1154	0.2084	1.0000	0.0449
16	Weight of tuber	0.0213	-0.0802	0.1434	0.0668	0.0512	0.0333	0.04401	1.0000

respectively. Similarly number of branches/plant showed positive correlation with days required for bud emergence (0.0750), number of flowers/plant (0.0682), number of flowers/head (0.1096), diameter of tuber (0.1785) and weight of tuber (0.0179) during 2011-12. Number of leaves/plant has major role in the performance of the plant and this character revealed positive correlation with diameter of leaf stalk (0.0086), length of flower (0.2947) and diameter of tuber (0.2561) aspects in present investigations during 2011-12. Similarly during 2012-13 this character has shown positive correlations with plant height, number of branches/plant, length of branch, length of leaf, number of per plants, diameter of flower, number of tubers/plant and weight of tuber aspects in the present investigations. The other character have also revealed positive correlations in different characters. The environmental correlation has also gave some negative observations which ahs also important value.

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