Journal of Crop and Weed, 12(3):23-26(2016)

Seed and seedling quality evaluation of some winter flower in New Alluvial Zone

P. KUMARI, S. K. BORDOLUI AND [1]R. SADHUKHAN

Department of Seed Science and Technology, [1] Department of Genetics and Plant Breeding, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur-741252, Nadia, West Bengal.

Received : 12-12-2016; Revised : 25-12-2016; Accepted : 31-12-2016

ABSTRACT

India is bestowed with several agro-climatic zones conducive for production of sensitive and delicate floriculture products. Ornamental flower seed production seems one of the viable options to explore with great export potential and the Indian climatic conditions are favorable for their cultivation. West Bengal has good environment during winter which is highly suitable for flower seed production. With the above consideration, the present investigation has been undertaken to evaluate of ten flower crops such as Candytuft, Flox, Dimorphotheca, Saponaria, Dianthus, Cornflower, Annual chrysanthemum, Scorodynum, Lupin and Poppy and document there various seed quality parameters during 2014-2015 at Mondouri farm, BCKV, West Bengal, India. Among the winter annuals Saponaria scored highest seed yield per plant (9.63g). Lowest seed yield per plant was recorded in poppy (1.50g). Regarding test weight, lupin recorded the highest performance i.e. 13.67 g followed by dimorphotheca (12.11g), while Poppy recorded the least weight in all situations. Immediately after harvesting among the winter annuals Cornflower was highest germination percentage (90%) and no germination was found in annual Chrysanthemum and poppy. After viability test it can be confirmed that Chrysanthemum and poppy have the dormancy. Both Annual Chrysanthemum and Poppy dormancy period is two months, confirmed it after TZ test. Five months after harvesting highest germination percentage was found in cornflower (72.667), lowest was found in Saponaria and Lupin (64.667). The significant variation among the flower crops for the trait germination percentage.

Kewwords: Seed quality, storability winter flower

Flowers are associated with mankind from drawn of civilization. India has a long tradition of floriculture. References to flowers are found in most of our ancient classic literature, like the Vedas, Ramayana, Mahabharata, *etc*. depiction of flowers in ancient painting, murals coins, *etc* was common. All this gives idea of the close association of floriculture with our life and culture. Flowers are used for various purposes in our day to day life like worshipping, religious and social function, wedding, interior decoration. In spite of this long close association of floriculture records of commercial activity related to this area is limited. India is bestowed with several agro-climatic zones conducive for production of sensitive and delicate floriculture products. During the decade after liberalization floriculture industries took giant steps in the export arena. This era has seen a dynamic shift from sustenance production to commercial production. Floriculture is now commercially cultivated in several states with West Bengal (32%), Karnataka (12%) Maharashtra (10%), having gone ahead of other producing states like Madhya Pradesh, Gujarat, Punjab, Haryana, Andhra Pradesh, Orissa, Jharkhand, Uttar Pradesh and Chhattisgarh. The major importing countries were United States, Netherlands, Germany, United Kingdom, United Arab Emirates, Japan and Canada. There are more than 300 export-oriented units in India. More than 50 per cent of the floriculture units are based in Karnataka, Andhra Pradesh and Tamil Nadu. With the technical collaborations from foreign companies, the Indian floriculture industry is poised to increase its share in world trade.

Ornamental flower seed production seems one of the viable options to explore with great export potential and the Indian climatic conditions are favorable for their cultivation (Chawla, 2004). There has been limited availability of quality flower seed in our country. In the earlier days, most seeds were imported particularly from Europe. Studies revealed that flower seed production can provide more income and has great future prospects in global markets (Chawla, 2004). Subsequently, several leading flower seed producing companies set up production facilities in India for targeting domestic market as well as exports. This also led interest among Indian growers to take up commercial production in few areas, like Punjab, Jammu and Kasmir, Himachal Pradesh, Karnataka and west Bengal. The seed policy on seed development introduced by the ministry of agriculture in 1988 has produced access to farmers to the best planting material has also been abolished (Hander, 1998). The value of flower seeds and other propagates exported from India was to the tune of Rs.188 million during 93-94. Out of

Email: sanjoy_bordolui@rediffmail.com

this amount, flower seeds alone worth Rs.30 million were exported (Dasgupta *et. al*., 1995) flower seeds worth RS. 30 million and Rs.60 milon are sold annually from Indo-American Hybrid seeds and the state of Punjab respectively (Raghava, 2002)

Finally, in the context of the flower seed production, there is a great scope to produce in Indian condition. Most of the flower seeds come from outside India. So the flower seeds are very costly and it is not easy access to the farmers. They would not get all the flower seeds from his near market.

MATERIALS AND METHODS

The field experiment was carried out to elucidate the effect of growth, flowering and seed production of ten winter annuals such as candytuft, plox, dimorphotheca, saponaria, dianthus, cornflower, annual chrysanthemum, scorodynum, lupin and poppy at mondouri farm, BCKV, West Bengal during 2014-15. The field was located in the Gangetic new alluvial zone. Seeds of all the winter annuals were raised in individual plots following standard agronomic practices and intercultural operations. Randomised Block Design with three replications was followed. The seeds are sown in the experimental plots following a spacing of 30 cm between the rows, 30 cm between the plants. Each plot was of 3m length and 3m breadth.

Observations were recorded on days to 50 per cent flowering, days to visible seed set, maturity, seed yield, test weight, germination percentage, root length, shoot length, seedling length and vigour index (Abdul-Baki and Anderson, 1973)

RESULTS AND DISCUSSION

Performances of ten winter annuals for various characters are presented in Table-1. Significant variation in yield as well as other characters was noticed among the crops. With respect to days to visible seed set, there was variation among the crops. However the maximum days to seed set were noted in dianthus (124.67) but minimum days to set seed was noted in candytuft. The flower crops showed significant variation for this trait.

Table-1: Mean value of days to 50% flowering, days to visible seed set, maturity, yield per plant and test weight of winter annuals.

Sl. No.	Name of winter annual	Days to 50% flowering	Days to visible seed set	Days to maturity (DAS)	Yield plant^{-1} (g)	Test weight (g)
1	Candytuft	77.33	102.33	148.33	5.10	2.64
2	Phlox	86.33	104.33	179.67	4.43	1.90
3	Dimorphotheca	106.00	113.33	162.33	2.81	12.11
4	Saponaria	104.33	123.33	151.67	9.63	3.23
5	Dianthus	93.00	124.67	166.67	9.37	0.88
6	Cornflower	82.67	119.33	146.33	3.60	5.03
7	Annual chrysanthemum	78.00	107.33	162.33	2.63	0.79
8	Acroclynium	108.00	120.33	156.67	1.51	3.58
9	Lupin	107.67	121.00	157.00	1.17	13.67
10	Poppy	94.33	111.67	155.33	1.50	0.30
SEm(±)		**0.49**	**0.36**	**0.66**	**0.79**	**0.33**
LSD (0.05)		**1.47***	**1.08***	**1.96***	**2.34***	**0.98***

With regard to days to 50 per cent flowering Acroclynium had the longest period (108 days). But the shortest (77.33 days) to 50 per cent flowering was noted in candytuft. However, among the flower crops 50% flowering displayed significant variation in performance. The mean of maturity time was longest in dianthus (166.67 DAS) and shortest maturity was found in cornflower (146.33 DAS). The significant variation among the flower crops for the trait maturity time. Among the winter annuals saponaria scored highest seed yield per plant (9.63g). Lowest seed yield per plant was recorded in poppy (1.50g). However, the crops displayed significant variation in performance. The seed yield per plant was recorded highest in saponaria, followed by dianthus and candytuft. Similar type of result was found in case of dianthus by Sharma *et al*. (2015).In case of

seed yield per plant significant variation was recorded among the flower crops. Regarding test weight, lupin recorded the highest performance *i.e.* 13.67 g followed by dimorphotheca (12.11g), while poppy recorded the least weight in all situations. Test weight of dianthus was 0.88g. The result was similar to Sharma *et al* (2015). Here also significant variation was found between flower crops.

Table-2: Mean values of germination, root length, shoot length, seedling length and vigour index of winter annuals at just after harvesting.

Sl. No.	Name of winter annuals	Germination (%)	Root length (cm)	Shoot length (cm)	Seedling length (cm)	Vigour index
1	Candytuft	76.333	2.393	3.71	6.097	465.3
2	Phlox	79.333	3.793	2.25	6.04	481.6
3	Dimorphotheca	71.667	4.3	3.277	7.577	542.683
4	Saponaria	71.333	3.787	3.5	7.287	519.553
5	Dianthus	85	4.73	3.71	8.437	717.097
6	Cornflower	90	6.133	3.833	9.967	865.49
7	Annual chrysanthemum	0	0	0	0	0
8	Acroclynium	82	5.99	4.633	10.623	871.227
9	Lupin	77.667	3.22	1.96	5.177	424.063
10	Poppy	0	0	0	0	0
SEm(±)		**0.89**	**0.22**	**0.21**	**0.37**	**36.22**
LSD (0.05)		**2.63****	**0.66****	**0.61****	**1.10****	**107.60****

*Note: **means significant at 1% level*

Immediately after harvesting among the winter annuals cornflower was highest germination percentage (90%) and no germination was found in annual chrysanthemum and poppy. After viability test it can be confirmed that chrysanthemum and poppy have the dormancy. However, the different flower crops displayed significant variation in performance. In case of root length highest value was found in Cornflower (6.133 cm) followed by acroclynium and lowest in chrysanthemum as well as poppy as they were dormant. The highest shoot length (4.633 cm), seedling length (10.623) and vigour index (871.227) was found in acroclynium. Lowest value of shoot length (0), seedling length (0) and vigour index (0) was recorded in annual Chrysanthemum and poppy as both flower crops remain dormant. Both annual chrysanthemum and poppy dormancy period is two months, confirmed it after TZ test. Significant differences among the flower crops exists for the shoot length, seedling length and vigour index at immediately after harvesting.

Table-3: Mean values of germination, root length, shoot length, seedling length and vigour index of winter annuals at 5 months after harvesting.

Sl no.	Name of winter annuals	Germination (%)	Root length (cm)	Shoot length (cm)	Seedling length (cm)	Vigour index
1	Candytuft	66	1.797	3.687	5.483	362.527
2	Phlox65.333	3.963	2.22	6.183	403.933	
3	Dimorphotheca	65.333	1.783	0.977	2.76	179.05
4	Saponaria	64.667	1.787	0.953	2.653	177.35
5	Dianthus66.667	3.123	2.517	5.64	376	
6	Cornflower	72.667	2.817	2.047	4.867	350.877
7	Annual chrysanthemum	66.667	6.35	2.487	8.837	585.793
8	Acroclynium	71.667	3.867	3.097	7.23	518.633
9	Lupin	64.667	2.07	0.823	2.897	187.283
10	Poppy	72	2.68	1.477	4.157	297.067
SEm(±)		**0.95**	**0.23**	**0.28**	**0.41**	**27.36**
LSD (0.05)		**2.81****	**0.69****	**0.82****	**1.23****	**81.30****

*Note: **means significant at 1% level*

Five months after harvesting highest germination percentage was found in cornflower (72.667), lowest was found in saponaria and lupin (64.667). The significant variation among the flower crops for the trait germination percentage. Highest root length (6.35 cm) was found in annual chrysanthemum lowest in dimorphotheca (1.783 cm). The significant variation among the flower crops for the trait root length. Highest shoot length was recorded in candytuft (3.687 cm), whereas lowest shoot length was recorded in lupin(0.823). The flower crops showed significant variation for shoot length. Highest seedling length was recorded in annual chrysanthemum (8.837 cm) lowest seedling length was recorded in saponaria (2.653 cm). In case of seedling length significant variation was recorded among the flower crops. Highest vigour index was recorded in annual chrysanthemum (585.793) lowest was found in Saponaria(177.35). Significant variation was recorded in vigour index among the flower crops.

Among the ten winter annuals, most of them had the better performance for most of the phenotypic traits. The seed yield per plant was recorded highest in saponaria (9.63 g) followed by dianthus (9.37 g) and candytuft (5.10 g). Similar type of result was found in case of dianthus by Sharma *et al*. (2015). Immediately after harvesting among the winter annuals cornflower was highest germination percentage (90%) and no germination was found in annual chrysanthemum and poppy. After viability test it can be confirmed that chrysanthemum and poppy have the dormancy. Both annual chrysanthemum and poppy dormancy period is two months, confirmed it after TZ test. Five months after harvesting highest germination percentage was found in cornflower (72.667), lowest was found in saponaria and lupin (64.667). The significant variation among the flower crops for the trait germination percentage.

According to seed standard of flower crops the minimum germination percentage is 60. From the experiment it has been observed that all the ten winter annuals have germination 60 per cent. After viability test it can be confirmed that chrysanthemum and poppy have the dormancy. Hence it can be concluded that there is great possibility of seed production of winter annuals in new alluvial zone.

REFERENCES

Abdul-Bak, A.A. and Anderson, J. G. 1973. Vigour determination in soybean seeds by multiple criteria, *Crop Sci.*, **13**: 630-33.

Chawla, K. S. 2004. Big boost to floriculture. *The Tribune*, Chandigarh, India. January 15.

Dasgupta, P.R.; Ghosh, S.K. and Foning, M.S.1995. Flower seeds and bubs industry in India.(In) *Prospects of Floriculture in india (*Eds. G.l. kaul and N. Dadlani.) Dept. of Agric. and Co-operation, Ministry of Agric., Govt of India, pp. 139-52.

Hander, A.B. 1998. An introduction to the flower seed industry.(In : *Taxonomy of Cultivated Plants*. Proc. Meeting held in Edinburg, Scotland(Eds. S.Andrews, A. Leslie and C.Alexender. Botanic Gardens, Kew,U.K. pp.41-44.

Raghava, S.P.S. 2002. Hybrid seed productionin flowers. *Indian Hort*., Jan-March. pp. 29-31.

Sharma, P., Gupta, Y. C., Dhiman , S. R., Sharma, P. and Bhargav, B. 2015. Effect of planting time on growth, flowering and seed yield in *Dianthus barbatus* L., *Nat. Acad. Sci.* **38** : 189-92.