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Response of IBA and Rooting Media on Rooting of Cutting in Chrysanthemum

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Abstract: ***An experiment was conducted to study the response of IBA and rooting media on rooting of cutting in chrysanthemum cv. Piwali Rewadi during the kharif season 2012-13 at Horticulture Section, College of Agriculture , Nagpur. The experiment was laid out in Factorial Completely Randomized Design with four main factor (500 ppm IBA, 750 ppm IBA, 1000 ppm IBA and control and four sub-factor (Sand, Sand + FYM (2:1), Sand + Silt + FYM (2:1:1) and Sand + Silt + FYM (1:1:1). Results of the investigation showed that days to rooting, fresh weight of roots, dry weight of roots, days to sprouting, fresh weight of shoots and dry weight of shoots were found to be higher in treatment application of IBA 1000 ppm. In case of rooting media it is higher in sand + FYM (2:1) and minimum days required to rooting and days to sprouting is in Sand + Silt + FYM (1:1:1).***

Keywords: Chrysanthemum, Indole Butyric Acid (IBA), rooting media)

1. Introduction

Chrysanthemum (Dendranthema morifolium) is one of the versatile flowers commonly known as ‘glory of the east’ or as ‘Mum’ in USA. Chrysanthemum belongs to ‘Asteraceae’ family having more than hundred species. Its plants are perennial, vigorous and bear flowers of various forms; it blooms fast over the period of almost one to two months. Chrysanthemum native to the Northern Hemisphere chiefly Europe and Asia with a few in other area. Among the important commercial flower

crops, chrysanthemum stands next to rose and called as “Queen of East”. It has gained popularity among the flower growers of its easy cultivation and wide adoptability. In Maharashtra chrysanthemum crop is more popular among the farmers because easy cultivation for cut as well as loose flowers. The role of PGR like Indole Butyric Acid in inducing rooting in many horticultural crops is an established fact. The effectiveness of IBA to induce rooting, improve the rooting percentage and increased in survival of rooted cuttings has been shown. The different types of rooting media to be used for rooting of chrysanthemum are important aspects to be considered with a variety of media available like sand, silt, FYM and their combination, the most suitable media for rooting needs to be a standardized.

2. Material and Method

An experiment entitled “Effect of IBA and rooting media on rooting of cutting in chrysanthemum” was conducted at an experimental field of Horticulture Section, Bharat nagar, College of Agriculture, Nagpur during the kharif season, 2012. The experiment was laid out in Factorial Completely Randomized Design (FCRD) with sixteen treatments and three replications to observed the response of IBA and rooting media on rooted cutting. Stock solution of 1 % IBA will be prepared for this 10 gm of IBA will be taken up and it will be dissolved in 100 to 150 ml of Absolute alcohol or Acetone and as per requirement of treatment. Required concentration solution will be taken for dipping of cutting for 15 minutes then same treated cuttings will be planted.Two hundred cuttings in four plastic crates for one treatment similarly for others remaining treatment were placed and checked weekly for initiation of roots to find the time required for rooting. Observations on root were recorded after 60 days of planting of the cuttings. At the time of recording the observations, the cutting were carefully uprooted and washed in running water to remove the media particles. The cuttings will be sown in the plastic crates. Necessary care will be taken to raise healthy and strong cuttings. The plastic crates will be watered for easy rooting of the plants. For recording the observations the technique of random sampling was adopted. Five cuttings were randomly selected in each treatment from all the replications for recording the various observations like days to rooting, fresh weight of roots cutting-1 and dry weight of roots cutting-1, days to sprouting, fresh weight of shoot and dry weight of roots.

3. Results and Discussion

3.1 Root parameter

3.1.1 Effect of IBA and rooting media on days to rooting

a) Effect of IBA

It was evident from the Table 1 that, the treatment application of IBA 1000 ppm (9.33 days) gave statistically minimum days required for rooting over remaining treatments. This might be due to the fact that external application of auxins promotes growth and produce more favourable condition for sprouting. This treatment was at par with treatment application of IBA 750 ppm (09.41 days) and followed by treatment application of IBA 500 ppm (10.18 days). The maximum days required for rooting of cuttings were recorded in control treatment (11.46 days).The results are conformity with findings of scientists Gill and Daulata (1996) in Plum.

b) Effect of Rooting Media

The data presented in table 1 showed that, significant influence of rooting media on days to rooting of chrysanthemum. Significantly minimum days to rooting was recorded in rooting media Sand + Silt + FYM (1:1:1) (09.71 days). Therefore, the treatment of rooting media Sand + Silt

+ FYM (1:1:1) was significantly superior but at par with the rooting media treatment Sand + Silt + FYM (2:1:1) (09.94 days) and Sand (09.99 days). This might be due to the fact that it hold large amount of water developed porousness, aeration due to the use of sand. The maximum days to rooting was noticed in Sand + FYM (2:1) (10.74 days).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be significant for days to rooting of chrysanthemum. The minimum days to rooting were recorded in treatment combination I_2M_4 (08.80 days) which was followed by I_3M_3 (09.06 days) and I_4M_1 (09.10 days). Maximum days to rooting were recorded in treatment combination I_2M_2 (12.13 days). .

3.1.2 Effect of IBA and rooting media on fresh weight of root

a) Effect of IBA

It was evident from the Table1 that, treatment IBA 1000 ppm was statistically superior over the remaining treatments. The maximum fresh weight of roots was (1.86 g) recorded in the treatment of IBA 1000 ppm but at par with the treatment IBA 500 ppm (1.84 g) and 750 ppm (1.83 g). The minimum fresh weight of roots was recorded in control treatment (1.81 g).

b) Effect of rooting media

The data presented in table 1 showed that, significant influence of rooting media on fresh weight of root of chrysanthemum. The maximum fresh weight of root per cutting was recorded in treatment rooting media Sand + FYM (2:1) (1.86 g). Therefore, the treatment of rooting media Sand + FYM (2:1) was significantly superior over remaining other treatments but at par with the treatment rooting media Sand (1.84 g). Minimum fresh weight of root per cutting was recorded in rooting media Sand + Silt + FYM (1:1:1 (1.80 g).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be non significant for fresh weight of roots per cutting of chrysanthemum.

3.1.3 Effect of IBA and rooting media on dry weight of root

a) Effect of IBA

It was evident from the Table 3 that, treatment IBA 1000 ppm was statistically superior over the remaining treatments. The maximum dry weight of roots was (0.16 g) recorded in the treatment of IBA 1000 ppm but at par with the treatments of IBA 500 ppm (0.15 g) which was also statistically at par with treatment IBA 750 ppm (0.14 g) and control treatment (0.14 g). The minimum dry weight of roots was recorded in control treatment (0.14 g) and IBA 750 ppm (0.14 g).

b) Effect of rooting media

The data presented in table 1 showed that, significant influence of rooting media on dry weight of roots per cutting on chrysanthemum. The maximum dry weight of roots per cutting was recorded in treatment rooting media Sand + FYM (2:1) (0.17 g). Therefore, the treatment of rooting media Sand + FYM (2:1) was significantly superior over other remaining treatments. Minimum dry weight of root per cutting was recorded in rooting media Sand (0.13 g).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be non significant for dry weight of roots of chrysanthemum.

3.2 Shoot parameter

3.2.1 Effect of IBA and rooting media on days to sprouting

a) Effect of IBA

It was evident from the Table 1 that, the treatment application of IBA 1000 ppm (8.80 days) gave statistically minimum days required for sprouting over remaining treatments. It might be due to the fact that external application of auxins promotes growth and produce more favourable condition for sprouting. This treatment was followed by the treatment application of IBA 750 ppm (9.68 days). The maximum days required for sprouting was observed in control treatment (11.83 days. The results are conformity with findings of scientists Singh et al. (2010) in Bougainvillea.

b) Effect of rooting media

The data presented in table 1 showed that, significant influence of rooting media on days to sprouting of chrysanthemum. Significantly minimum days to sprouting was recorded in rooting media Sand + Silt + FYM (1:1:1) (09.70 days). Therefore, the treatment of rooting media Sand + Silt + FYM (1:1:1) was significantly superior but it is at par with the rooting media Sand + Silt + FYM (2:1:1) (09.78 days). This might be due to the fact that this media was highly porous material and therefore it absorb the large amount of water. The maximum days to sprouting was noticed in Sand + FYM (2:1) (10.40 days) which was also at par with the treatment of rooting media Sand (10.23 days).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be significant for days to sprouting of chrysanthemum. The minimum days required for sprouting was recorded in treatment combination I_2M_2 (8.33 days) closely followed by I_4M_1 (8.46 days) and I_4M_4 (8.60 days). This might be due to the fact that mixture of sand, silt and fym (2:1:1). It provides suitable condition as it acts as a soil conditioner. The maximum days required for sprouting was recorded in treatment combination I_1M_1 (12.66 days).

3.2.2 Effect of IBA and rooting media on Fresh weight of shoot

a) Effect of IBA

It was evident from the Table 11 that, treatment IBA 1000 ppm was statistically superior over the remaining treatments. The maximum fresh weight of shoots was (1.87 g) recorded in the treatment of IBA 1000 ppm along with treatments application of IBA 500 ppm (1.86 g) and 750 ppm (1.85 g) statistically at par with each other. The minimum fresh weight of shoots was recorded in control treatment (1.81 g).

b) Effect of rooting media

The data presented in table 1 showed that, significant influence of IBA and rooting media on number of roots per cutting on chrysanthemum. The maximum fresh weight of shoot per cutting was recorded in treatment rooting media Sand + FYM (2:1) (1.87 g). Therefore, the treatment of rooting media Sand + FYM (2:1) was significantly superior

over remaining other treatments but along with treatments rooting media Sand (1.85 g) and Sand + Silt + FYM (2:1:1 (1.85 g) statistically at par with each other. Minimum fresh weight of shoot per cutting was recorded in rooting media Sand + Silt + FYM (1:1:1) (1.81 g).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be non significant for fresh weight of shoots per cutting of chrysanthemum.

3.2.3 Effect of IBA and rooting media on dry weight of shoot

a) Effect of IBA

It was evident from the Table 1 that, treatment IBA 1000 ppm was statistically superior over the remaining treatments. The maximum dry weight of shoots was (0.17 g) recorded in the treatment of IBA 1000 ppm. This might due to the fact that positive response of IBA in increasing the dry weight of root of chrysanthemum cuttings. This treatment was followed by the other treatments of IBA 500 ppm (0.15 g) and IBA 750 ppm (0.15 g)). The minimum dry weight of roots was recorded in control treatment (0.14 g).

b) Effect of rooting media

The data presented in table 1 showed that, significant influence of rooting media on dry weight of shoot. The maximum dry weight of shoot per cutting was recorded in rooting media Sand + FYM (2:1) (0.18 g). Therefore, the treatment of rooting media Sand + FYM (2:1) was significantly superior over remaining other treatments. This treatment followed by rooting media Sand + Silt + FYM (2:1:1 (0.148 g) and Sand + Silt + FYM (1:1:1 (0.146 g). Minimum dry weight of shoot per cutting was recorded in rooting media Sand (0.143 g).

c) Interaction effect

An interaction effect of IBA and rooting media were found to be non significant for dry weight of shoot in chrysanthemum.

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Table 3: Response of IBA and rooting media and their interaction on root shoot characters of chrysanthemum

Treatments	*Days to rooting*	*Fresh weight of root*	*Dry weight of root*	*Days to sprouting*	*Fresh weight of shoot*	*Dry weight of shoot*
A- IBA						
I_1 Control	11.46	1.81	0.14	11.83	1.81	0.14
I_2 -IBA 500ppm	10.18	1.84	0.15	09.79	1.86	0.15
I_3 -IBA 750ppm	09.41	1.83	0.14	09.68	1.85	0.15
I_4 -IBA1000ppm	09.33	1.86	0.16	08.60	1.87	0.17
F test	**Sig.**	**Sig.**	**Sig.**	**Sig.**	**Sig.**	**Sig.**
S.E. (m) ±	0.12	0.01	0.003	0.11	0.009	0.004
C.D. at 5 %	0.34	0.03	0.01	0.32	0.02	0.01
B-Rooting media						
M1 –Sand	09.99	1.84	0.13	10.23	1.85	0.14
M2- Sand + FYM (2:1)	10.74	1.86	0.17	10.40	1.87	0.18
M3 – Sand + Silt+FYM(2:1:1)	09.94	1.82	0.14	09.78	1.85	0.14
M4 – Sand +Silt +FYM(1:1:1)	09.71	1.80	0.14	09.70	1.81	0.14
F test	**Sig.**	**Sig.**	**Sig.**	**Sig.**	**Sig.**	**Sig.**
S.E. (m) ±	0.12	0.01	0.003	0.11	0.009	0.004
C.D. at 5 %	0.34	0.03	0.01	0.32	0.02	0.01
Interaction A x B						
F test	**Sig.**	**NS**	**NS**	**Sig.**	**NS**	**NS**
S.E. (m) ±	0.24	0.02	0.007	0.22	0.01	0.008
C.D. at 5 %	0.69	-	-	0.65	-	-

Author Profile

Mayur Balasaheb Gawande did B.Sc. (Agri.) and M.Sc. (Horticulture.) (Floriculture & Landscaping) from Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India. His topic of dissertation is "Performance of different Varieties of Tuberose under Nagpur Conditions". He published one paper in international journal and presented 2 papers in National Conference and seminar. His one article got published in daily newspaper Hindusthan dated June 2011. Presently he is Working as Senior Research Fellow under the project “Climate Resilience-based production management of Nagpur mandarin”, under Competitive grants component of the national Initiative on Climate Resilient Agriculture (NICRA)" at National Research Centre for Citrus, Amravati road, Nagpur since 31 December 2013 till date.".