



Effect of Plant Growth Hormone on Terminal Cuttings of Chrysanthemum (Beverly Gold) in Completely Randomized Design

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Abstract

The experiment was carried out during August- October of 2022 in the Hi-tech polyhouse of Department of Horticulture, School of agriculture, Lovely Professional University. The experiment was laid out in Completely Randomized Design (CRD) with 7 treatments and replicated thrice. The effect of different auxins with various concentrations significantly differed among the treatments. Maximum root length (5.68cm) in NAA at 175ppm, followed by root spread (3.82 cm) and maximum number of primary roots (20.34) in IBA at 250ppm of rooted cuttings was observed in terminal cuttings of Chrysanthemum.

Keywords: Chrysanthemum, Hi-tech polyhouse, auxins, Completely Randomized Design.

Introduction

Chrysanthemum is herbaceous perennial flowering plant. It cultivates all over the world in order to produce beautiful flowers. It ranks second in the world international market as cut flower. The word Chryso means "Golden", and Anthos means "flower". It is commonly known as Queen of east/ Autumn queen/ Gul Daudi. It is short day plant – "Photo sensitive" (10 hours day light) Tall growing type suitable for background planting in borders. Dwarf growing for flower beds and pot culture (pot mums) Loose flowers – garland, veni, worship etc. The chrysanthemum is one of the most beautiful and perhaps the oldest flowering plants, commercially grown in different parts of the world.

Propagating Chrysanthemum by terminal cutting method is one of major traditional method. The main benefit by propagation by cutting method are the relative simplicity of operation, low unit cost of production and the ease plant will re-establish by themselves. So, this method of propagation is highly practiced and recommended (Wei-June Lu, 1958). Economic factors of cultivating the plants are highly influenced by method of propagation. Other important things consist of length of root, no. of primary roots and root spread. Root play's important role in water, minerals and nutrient uptake. Root play major role in supporting system to plant so root can be considered as the lifeline of plant. Plant growth regulator important aspects in growth, flowering and rooting in flower crop. It has an ability to improve rooting in different ornamental or flowering plants.

Materials and Methods

The experiment was carried out in the Hi-tech polyhouse of Department of Horticulture and School of Agriculture, LPU during August 2022 to October 2022. The maximum temperature during the experiment was 28°C and relative humidity of 71.89 percent. The planting material was obtained from uniformly grown plants of chrysanthemum planted at the Department of Horticulture, School of Agriculture, nursery of LPU. The terminal cuttings of Dendranthema

grandiflora were taken from “Beverly Gold” Variety pot, each cutting was of 4-5cm length having two or three buds for root initiation. The rooting media was cocopeat, perlite and vermicompost which was filled into the portrays. Seven auxin formulations were used at various concentrations, with thirty cuttings used for each treatment, which was replicated three times. The prepared cuttings were immersed in a variety of auxin concentrations. The cuttings basal 1.0 cm part was dipped in auxins formulation for 30 seconds before being planted in media to a depth of 3 cm. After cuttings were planted, the irrigation has been given. The planted cuttings were allowed to root for 25 days. The cuttings were removed carefully from the portrays and cleaned with water to remove the growing media pieces attached to roots to calculate the observations pertaining to roots viz., days taken for length of longest root, root length, root spread and number of primary roots success after 25 days of planting. The experiment was laid Completely Randomized Design (CRD) with 7 treatments replicated thrice and statistically analysed as per the methods.

Treatment details are represented in Table 1.

Table 1

T1	Control
T2	NAA 175 ppm
T3	NAA 250 ppm
T4	NAA 500 ppm
T5	IBA 175 ppm
T6	IBA 250 ppm
T7	IBA 500 ppm

Result and Discussion

The effect of different PGR with various concentration significantly differed among the treatments on root length, root spread, no. of primary root reflected in table 2. The maximum root spread 3.84 cm observed in IBA at 250 ppm. In NAA 175 ppm and 500 ppm observed same root spread 3.64 cm. The minimum root spread 1.38 observed in control treatment. NAA 250 and IBA 175 root spread (2.46 cm, 2.72 cm) found was on par after 25 DAP. The cutting treated with NAA at 175 ppm resulted highest root length 5.68 cm. In control observed lowest root length 1.84 cm. IBA 250 and NAA 500 was observed on par root length 4.83 cm 4.75 cm respectively after 25 DAP. The maximum number of primary roots (20.34) observed in cutting treated with IBA at 250 ppm followed by cutting treated with NAA 175 ppm (18.33) and minimum number of primary roots (2.67) found in control after 25 DAP.

Table 2

Treatment	Root spread (cm)	Root length (cm)	No. of primary roots
Control	1.38 cm	1.84 cm	2.67
NAA 175	3.64 cm	5.68 cm	18.33
NAA 250	2.46 cm	4.25 cm	8
NAA 500	3.64 cm	4.75 cm	12
IBA 175	2.72 cm	3.74 cm	7.11
IBA 250	3.82 cm	4.83 cm	20.34
IBA 500	1.90 cm	2.11 cm	4

The maximum root spread 3.84 cm observed in IBA at 250 ppm. In NAA 175 ppm and 500 ppm observed same root spread 3.64 cm. The minimum root spread 1.38 observed in control treatment. NAA 250 and IBA 175 root spread (2.46 cm, 2.72 cm) found was on par after 25

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Conclusion

As per result obtained, it can be concluded that IBA at 250 ppm is best for the early and maximum root spread and No. of primary roots, next best treatment is NAA at 175 ppm is best for root length in the terminal cuttings of Chrysanthemum.

References

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