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Effect of Auxins on Rooting Behaviour of Poplar (*Populus deltoids*, G-48) *Clone*

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A B S T R A C T

Study was conducted for standardization of nursery techniques and to observe the effect of Auxins on rooting behaviour of poplar. The solution of Auxin was made and cutting of poplar (G-48 clone) were soaked for 24 hours before planting. It has been concluded that among different concentration of auxin numbers of root/cutting, length of root/cutting, length of shoot/cutting, survival %, fresh wt. shoot, fresh wt. of root, dry wt. shoot, root/shoot ratio was found maximum in T_1 (IBA 500 ppm) therefore, it is recommended that IBA with 500 ppm can be given to obtain maximum yield.

Introduction

Poplar is one of the important fast growing commercial pulp wood and plywood species of India. However due to reduction in forest cover and increasing demand of pulpwood and plywood, supply of Poplar wood from the wild is dwindling. Hence as a means of overcoming shortage, concerted efforts are made to raise plantations of poplar. During initial growth period of poplar there is enough inter row space which permits cultivations of intercrops. As a results poplar based Agroforestry combinations have gained popularity in the recent past. Poplar with high productivity in 3-4 years rotation is being preferred, particularly as boundary plantations, in various agro forestry systems in northern part of India. A quantitative approach is an important step in the quest for a better understanding of the complex mechanisms of tree crop interaction, which should offer scientific basis for designing more productive and sustainable agro forestry systems. Poplars are known as 'short-rotation woody crops' because of their ability to grow fast thus mature quickly. In areas lacking natural forests, especially in the northern hemisphere, poplars have proved to be very valuable in satiating demand for timber. Even though they are considered a

minor contributor to the world's timber supply, the areas in production in the United States, South Korea, and China are increasing (Heilman, 1999). In the Near East they are known as the "blessed tree'' due to their ability to be fast-growing and disease resistant. The breeding interest in this particular tree stems from various factors. It is relatively easy to propagate, hybrids can be quickly cloned, and thus within a short time frame be made available for planting (Heilman, 1999).

Materials and Methods

The study was conducted for standardization of nursery techniques and to observe the effect of Auxins on rooting behaviour of poplar. The solution of Auxin was made and cutting of poplar (G-48 clone) were soaked for 24 hours before planting.

The cuttings were planted in a completely randomized design (CRD) with ten treatments each replicated thrice. In each replication, twenty cuttings were raised accordingly- data was recorded immediately after the cuttings emerged.

T_1 = IBA (500ppm)
T_2 = IBA (1000ppm)
T_3 = IBA (2000ppm)
T_4 = IAA (500ppm)
T_5 = IAA (1000ppm)
T_6 = IAA (2000ppm)
T_7 = IBA + IAA (500ppm)
T_8 = IBA + IAA (1000ppm)
T_9 = IBA + IAA (2000ppm)
T_{10} = Control (Distilled water)

Results and Discussion

Among the different concentrations of auxins used the maximum numbers of root/cutting was found with treatment T_1 (IBA 500ppm) followed by T_4 (IAA 500ppm) and was also statistically significant over the all other treatments at 4, 8 and 12 months. While minimum numbers of root/cutting was recorded with the increase of concentration i.e. (2000 ppm). The study revealed that IBA 500 ppm gives maximum length of root/cutting followed by IAA 500 ppm and the lowest was observed in T_{10} that was control without any concentration. Therefore, it is recommended that IBA should be given to obtain maximum yield. The study conducted that IBA 500 ppm gives maximum length of shoot/cutting followed by IAA 500 ppm and the lowest was observed in T_{10} that was control without any concentration. Therefore, it is recommended that IBA should be given to obtain maximum yield.

The maximum survival % was observed in treatment IBA 500 ppm followed by IAA 500 and the minimum survival % was observed in treatment T_{10} i.e. control. The maximum fresh wt. of shoot was observed in treatment IBA 500 ppm followed by IAA 500 and the minimum was observed in treatment T_{10} i.e. control. The maximum fresh wt. of root was observed in treatment IBA 500 ppm followed by IAA 500 and the minimum was observed in treatment T_{10} i.e. control. Among the different concentration of auxin used the maximum dry wt. of root was observed in treatment IBA 500 ppm followed by IAA 500 and the minimum was observed in treatment T_{10} i.e. control.

The maximum dry wt. of root was observed in treatment IBA 500 ppm followed by IAA 500 and the minimum was observed in treatment T_{10} i.e. control. Among the different concentration of auxin used the maximum root/shoot ratio was found with treatment T_1 (IBA 500ppm) followed by T_4 (IAA 500ppm) and was also statistically significant over the all other treatments at 4, 8 and 12 months. While minimum numbers of root/shoot ratio was recorded with the increase of concentration i.e. (2000 ppm).

Table.1 The effect of Auxins on rooting behaviour of Populus deltoids

Observation to be recorded/yr	Year	
	2013-14	**2014-15**
No. of roots per cutting	6.53 cm	7.15 cm
Length of root per cutting	5.80 cm	3.84 cm
Length of shoot per cutting	11.81 cm	11.80 cm
Survival %	68.96	64.78
Fresh wt. of shoot	1.52 gm	1.54 gm
Fresh wt. of root	1.66 gm	1.50 gm
Dry wt. of root	1.36 gm	1.93 gm
Dry wt. of shoot	9.66 gm	9.77 gm
Root/Shoot ratio	0.14	0.19

It has been concluded that among different concentration of auxin numbers of root/cutting, length of root/cutting, length of shoot/cutting, survival %, fresh wt. shoot, fresh wt. of root, dry wt. shoot, root/shoot ratio was found maximum in T_1 (IBA 500 ppm) therefore, it is recommended that IBA with 500 ppm can be given to obtain maximum yield.

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