

## **EFFECT OF DIFFERENT CONCENTRATIONS OF IBA AND 2, 4-D INDIVIDUALLY AND IN COMBINATION ON ROOT LENGTH OF VEGETATIVELY PROPAGATED SHOOT CUTTINGS OF *PYRUS COMMUNIS* VAR. BERTLETT IN NURSERY CONDITIONS**

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### **ABSTRACT**

The paper deals with the impact of different concentrations of IBA and 2,4-D on rooting of hard wood shoot cuttings of *Pyrus communis* var. Bertlett in nursery conditions.

**Keywords :** *Pyrus communis* var. bertlett, IBA, 2,4D, Nursery Conditions.

### **INTRODUCTION**

The pears (*Pyrus communis* var. bertlett) are one of the important crops that are adaptable to wide range of agro-climatic conditions. Among the most delicate temperate fruits, it is comparable to apple only in economic importance, acreage, productivity and varieties diversity (Sansavini, 1998). The tree is hardy and can flourish even on inferior lands with relatively less care. The major pear production area is confined to the North Western Himalayan region comprising the states of Jammu and Kashmir, Himanchal Pradesh and Uttarakhand.

Hard wood shoot cutting is one of best method for vegetative propagation of pears. It has several advantages over sexual reproduction, particularly in horticultural crops, as uniformity of yield and fruit quality, early bearing and easier maintenance and management operations. In some cases, it provides resistance or even immunity to pests or disease and may overcome unfavourable growing conditions by suitable combinations of rootstocks and scions. Root development of many species can be promoted by using growth regulators and hormones. Auxins (Indole Butyric Acid and 2,4 D) have been used extensively for promoting rooting in shoot cuttings of many

species (Cooper, 1935, Sen and Bose, 1966).

Present study deals with the impact of different concentrations of IBA and 2,4-D on rooting of hard wood shoot cuttings of *Pyrus communis* var. bertlett in nursery conditions.

## **MATERIAL AND METHODS**

### **Location of the study area and physiography:**

The present study was located at sub-tropical zone near Satpuli, District Pauri Garhwal in Garhwal Himalaya. Satpuli is located at the foot hill of Siwalik at left bank of the Nayar river. Geographically, it is located at the south of District Pauri Garhwal, at 29° 33' N latitude and 78° 45' E longitude at an altitude between 700 – 800 m above msl. It is surrounded by district head quarter in the north, Nayar in the west and south. Eastern boundary of the study area is marked by the Jaiharikhal block.

### **Climatic conditions of the study area:**

The climatic conditions of the upper Gangatic plains have been described by Agrawal (1989). The climate of the study area is sub-tropical. The summer and winter are notably hot and cold respectively. The whole year has been divided in to three seasons, viz. rainy, winter and summer. The meteorological data of experimental plots during the study period are set in Figure 1. The microclimate of the experimental plots was studied by placing raingauge, maximum and minimum thermometer and hygrometer. All the apparatus were placed at the center of the study plots for recording the meteorological data during the study period. The maximum rainfall was recorded in the month of August (556.5 mm) whereas number of rainy days was also observed in August (18 days) whereas minimum in the month of November. The maximum humidity was observed in the month of August (81%) whereas minimum in the month of April (36%) respectively. The maximum temperature was found to ranged between 36.1°C (June) to 20.7°C (January) whereas the minimum temperature was recorded within the range of 4.4°C (January) to 22.9°C (June).

### **Soil:**

The soil was analyzed at four different places of the study area and at three depth viz 0 – 10, 10 – 20 and 20 – 30 cm respectively. Soil was sandy loam at all the four places and the colour was yellowish brown at place 1 and 2 and was grayish brown at place 3<sup>rd</sup> and 4<sup>th</sup> respectively.

**Table 6. Root length (cm) of stem cutting of *P. communis* var. bertlett under nursery conditions as affected by 2,4-D100,250 and 500 ppm.**

Days of planting	2,4-D100ppm	2,4-D250ppm	2,4-D500ppm
15	Nil	Nil	Nil
30	Nil	Nil	Nil
45	Nil	Nil	Nil
60	Nil	Nil	Nil
75	0.38±0.08	0.41±0.07	0.36±0.05
90	1.03±0.17	0.93±0.09	0.85±0.38
105	2.13±0.29	1.23±0.45	1.36±0.45
120	4.05±0.43	2.31±0.49	2.04±0.49
135	5.73±0.61	2.93±0.57	2.69±0.51
150	6.47±0.69	3.41±0.65	2.91±0.64
165	7.05±0.77	3.93±0.83	2.93±0.64
180	7.19±0.87	4.14±0.91	2.93±0.64
195	7.25±0.63	4.43±0.91	3.01±0.64
210	7.25±0.63	4.43±0.91	3.01±0.64
225	7.25±0.63	4.43±0.91	3.01±0.64
240	7.25±0.63	4.43±0.91	3.01±0.64
255	7.25±0.63	4.43±0.91	3.01±0.64
270	7.25±0.63	4.43±0.91	3.01±0.64
285	7.25±0.63	4.43±0.91	3.01±0.64
300	7.25±0.63	4.43±0.91	3.01±0.64
315	7.25±0.63	4.43±0.91	3.01±0.64
330	7.25±0.63	4.43±0.91	3.01±0.64
345	7.25±0.63	4.43±0.91	3.01±0.64
360	7.25±0.63	4.43±0.91	3.01±0.64

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**Table 7. Root length (cm) of stem cutting of *P. communis* var. bertlett under nursery conditions as affected by IBA +2,4-D100,250, 500 ppm each.**

Days after planting	IBA +2,4-D100ppm	IBA +2,4-D250ppm	IBA +2,4-D500ppm
15	Nil	Nil	Nil
30	Nil	Nil	Nil
45	Nil	Nil	Nil
60	Nil	Nil	Nil
75	Nil	Nil	Nil
90	Nil	Nil	Nil
105	1.53±0.49	2.07±0.73	2.19±0.38
120	2.78±0.63	3.46±0.58	5.09±0.87
135	3.41±0.76	5.77±0.65	6.78±0.94
150	8.29±1.07	9.33±0.94	7.86±1.03
165	10.13±1.10	12.73±1.21	9.56±1.12
180	10.64±1.12	14.91±1.69	11.21±1.31
195	11.11±1.39	16.03±2.71	12.30±2.21
210	11.11±1.39	16.73±3.12	12.67±2.27
225	11.11±1.39	16.73±3.12	12.84±2.31
240	11.11±1.39	16.73±3.12	12.84±2.31
255	11.11±1.39	16.73±3.12	12.84±2.31
270	11.11±1.39	16.73±3.12	12.84±2.31
285	11.11±1.39	16.73±3.12	12.84±2.31
300	11.11±1.39	16.73±3.12	12.84±2.31
315	11.11±1.39	16.73±3.12	12.84±2.31
330	11.11±1.39	16.73±3.12	12.84±2.31
345	11.11±1.39	16.73±3.12	12.84±2.31
360	11.11±1.39	16.73±3.12	12.84±2.31

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