



Short Communication

Effect of Rooting Hormone and Growth Media on Vegetative Propagation
(Marcotting) of *Thuja occidentalis*

¹Adams, B.A., ²Elesho, R.O., ²Aluko, A.K
¹Forestry Research Institute of Nigeria (FRIN)
²Federal College of Forestry, Ibadan

Abstract

This research was carried out at the Federal College of Forestry, Jericho, Ibadan to investigate the effect of rooting hormone and rooting media on the vegetative propagation (marcotting) of *Thuja occidentalis* via air layering. The materials used were topsoil, soaked sawdust, sterilized river sand, Doff hormone and transparent nylon. Data collected include root length and number of root, which were taken fortnightly from 8-14 weeks after layering. The data were analysed using descriptive analysis. The result obtained showed that soaked sawdust with hormone had the highest number of roots (64) followed by topsoil and hormone (54). Topsoil and sterilized river sand had 37 while sterilized river sand with hormone had the least number of roots (32). Sterilized river sand had the longest root (30.8cm) followed by soaked sawdust with hormone (30.4cm). Topsoil had 26.9cm, while sterilized river sand had the shortest root length (25.6cm). However, the use of hormone (Doff) with soaked sawdust produced the best rooting of *Thuja occidentalis* in the experiment. The combination of soaked sawdust and hormone is recommended in rooting of *Thuja occidentalis* plant species.

Keywords: *Thuja occidentalis*, plant species, marcotting, Doff hormone

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Introduction

Thuja occidentalis plant is one of the exotic ornamental plants. It is an evergreen growing wild tree in North American, Korea, Japan and China. It belongs to the family Cupressaceae. It is a very pretty and hard plant in most part of America where the soil is suitable and atmospheric conditions are fairly cleared. *Thuja occidentalis* plant is commonly called Arbovitae. It form good hedges and screen; it is a good plant for wind break and also serve as a specimen plant (Bean, 1981). It has a good shape which makes it more attractive to people, thus ornamental plant. It grows well in temperate region through seed propagation.

Nigeria like many developing countries in the world has the most complex ecosystem and is endowed with enormous varieties of tree species.

Soil is a natural layer that covers the surface of the earth and support the life of the plant. It helps and enhances rooting of plant. Other media such as sawdust, cocoa husk, and maize husk are also used for rooting in plant (Umeh, 1989). In layering of plant, it has been discovered that sawdust gives a better rooting than soil, Root medium helps to hold the plant firmly for good rooting and vigorous plant, it also provides moisture for the cut or layered plant. It helps to retain water and also permit the penetration of air to the base of the cut part of the plant (Ewusie, 1980).

Hormones are synthetic root promoting chemicals that have been found most reliable in stimulating adventitious root production in cutting and layering. Hormones are used in place of chemicals like fertilizers to increase the percentage of rooting and layering. It is used to hasten root initiation to increase the number and quality of root produced and the uniformity of rooting (Pearse, 1978). The used of ornamental plant for beautification and landscape in the environment and towns is gaining much of recent due to the awareness of people of the need for environmental beautification and landscape, these have given rise in providing effective ways of meeting the demand for highly prized ornamental plants such as *Thuja occidentalis* which is relatively high in demand. Therefore, the research was aimed to determine the effect of rooting hormone and rooting media on the vegetative propagation of *Thuja occidentalis* via air layering

Materials and Method

Area of Study

The experiment was carried out at the Horticultural Nursery, Federal College of Forestry, Jericho, Ibadan.

Method Used For the Propagation

A matured *Thuja occidentalis*, was used for propagation via air layering. The bark of the branch of 1.5cm width was removed through the circular cut with a small blade. This was done to stimulate the formation of new root through the cut area. It was ensured that cambium layer was completely removed to prevent the bark formation and allow the root to be initiated.

The peeled part was enclosed with the growing media in a ball shape and wrapped with nylon around the twig in order to ensure a close contact. The two ends were tied firmly with a thread to the plant. There was an injection of 10ml of water through syringe fortnightly. The synthetic hormone (Doff) was supplied to the pot area in a powdery form with the growing media. The experiment lasted for 14weeks.

Experimental Design

The experimental design was Complete Randomized Design (CRD), consisting of 5 treatments and 4 replicates. The treatments include;

- T₁- Topsoil only
- T₂- Topsoil + Hormone
- T₃- Soaked sawdust + Hormone
- T₄- Sterilized River sand
- T₅- Sterilized River sand + Hormone

Data Collection and Analysis

Data collection started eight weeks after layering; subsequent data were taken at two weeks interval. The variables measured include the number of root and root length. The data were subjected to descriptive analysis.

Results and Discussion

The result did not show any appreciable rooting until after 8 weeks of layering, soaked sawdust + hormone T₃ had the highest root number (8) followed by T₂ (7). T₁ and T₄ had the same root number (3) while T₅ had the least number of roots (2). Generally, the root number increased with time in all the treatments. At week 10, T₃ still had the highest number (13) followed by T₂ (11) while T₅ had least root number (3). At week 14, T₃ had the highest of root (26) followed by T₂ (22), while T₄ had 18 and T₁ with 17, while T₅ still had the least number (11) as presented in Table 1.

Table 1: Effect of rooting hormone and rooting media on the number of roots of *Thuja* (8-14 weeks after layering).

Treatment	Weeks After Layering (WAL)				Mean total
	8	10	12	14	
T ₁	3	6	11	17	9.25
T ₂	7	11	14	22	13.5
T ₃	8	13	17	26	16.0
T ₄	3	5	10	18	9.0
T ₅	2	3	7	11	5.75

The best result was produced by T₃ due to the ability of sawdust to retain enough water for long and the enhancement of Doff hormone in rooting of the plant. These agrees with report of Hartman and Kester, (1983) that the successful establishment of any air layered plant depends largely on the availability of constant moisture, fertility of medium used and health of the plant used.

Table 2: Effects of rooting hormone and rooting media on the root length (cm) of *Thuja occidentalis* (8-14wks after layering)

Treatment	Weeks after layering (WAL)				Mean total
	8	10	12	14	
T ₁	4.5	5.5	7.4	9.5	6.7
T ₂	4.0	6.2	7.7	10.1	7.0
T ₃	4.8	6.4	8.4	10.8	7.6
T ₄	4.5	6.5	8.5	11.3	7.8
T ₅	4.6	5.9	6.8	8.3	6.4

T₃ showed the longest root length (4.8) followed by T₅ (4.6). The root length of T₁ and T₄ were the same (4.5) while T₂ had the shortest root length (4.0). However, at the end of the research, T₄ produced the longest root length (11.3), followed by T₃ (10.8), T₂ had 10.1, T₁ had 9.5 and T₅ had the shortest root length (8.3).

It was observed that T₄ produced the longest root length when compared with other treatments. This shows that sterilized river sand enhances the development of root length of *Thuja occidentalis* Plant as revealed in Table 2.

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