

Standardization of hormone concentrations in rooting of stem cuttings of *Ailanthus excels* Roxb.

Dr. M. Mamatha¹ and B. Venkateshwar Rao²

¹Asst Professor in Botony, Telangana University, Nizamabad. Mobile: 919885226957, Fax: 08461 222212

²Forest Training College,, Hyderabad

Accepted 02 April 2014, Available online 15 April 2014, Vol.2 (March/April 2014 issue)

Abstract

This paper presents the importance of *Ailanthus excelsa* in aforestation programmes, particularly reclamation of wastelands and various difficulties like collecting the seed, low viability of seed. Experiments were conducted to standardize the rooting of the branch cuttings of *Ailanthus excelsa roxb.* at RFRC, Mulugu A.P. The present study revealed that 3500 ppm of IBA concentration is most suitable for obtaining maximum rooting in the stem cuttings of *Ailanthus excelsa*.

Keywords: Hormone concentrations, Stem cutting

Introduction

Ailanthus excelsa, the tree of heaven, is a densely foliaceous, deciduous tree up to 25 mt tall with whitish bark [1]. Stem is straight and cylindrical; bark is smooth in young trees and rough, glandular and grayish brown in older trees with conspicuous leaf scars. It is indigenous to South and Central India, extensively cultivated as an avenue tree in aforestation programmes and in reclamation of wastelands in low rainfall regions[2]. It grows in mixed, deciduous, semi-arid and in semi-moist regions. It is a suitable species for the areas of 400 mm annual rainfall on a variety of soils, commonly in broken grounds [3].

The bitter and aromatic leaves of the plant show medicinal properties. The leaves are used for the preparation of lotions for scabies. The bark yields inferior quality of gum called BASSORA used for stomach-ache, anathematic, anti-spasmodic, expectorant and it is also used for bronchitis, asthma and dysentery. It is also a good substitute for the holorrhena and antidyenterica. The wood is especially used for making catamarans, small boats, packing cases, sword handles, toys and also is used for making poor quality match wood [4].

The fruit of *Ailanthus excelsa* is having 1 to 5 samaras, winged with prominent veins, with one seed at the centre and compressed. The possibility of wind dissemination is more due to its winged nature of fruit. The seeds are available in May-June and natural regeneration comes up in July. Natural regeneration through coppice and root suckers is adequate. Coppice shoots are thinned for development. The seed loses its viability rapidly. The

seedling germination is scanty but the seedlings are suppressed due to sensitiveness and intolerance to weeds and shade. Several factors affecting the seedling regeneration are; inadequate drainage, trampling by cattle and weed competition [5].

The present research was undertaken keeping in view of the importance of *Ailanthus excelsa*, difficulties in collecting the seed and problem of short viability, experiments were conducted to standardize vegetative propagation technique, mainly the rooting of stem cuttings at Regional forest centre, Mulugu of Andhra Pradesh .

Materials and methods

The branch cuttings of *Ailanthus excelsa* were collected from phenotypically superior trees selected in the near by forest area (Mulugu Regional Forest) of Forest Research Centre, Mulugu [3]. The semi-hardwood branch cuttings of 10 to 15 inches length and 3 to 4 inches girth were treated with RIDOMIL @ 2.5 gm/ 1 lt. of water for a few minutes to avoid fungal infection in the polyglobule (propagating unit). The branch cuttings were treated with indole - 3 - butyric acid at different concentrations i.e. 500 ppm, 2000 ppm, 3500 ppm, 5000 ppm, 6500 ppm, and 8000 ppm. The cuttings were dipped in IBA mixed with talc by quick dip method and these cuttings were kept in ployglobules directly in fine sand. The temperature was maintained between 30°C and 35°C and relative humidity at 70 -85% (Fig 1 -2)

Table 1 Percentage of rooting at different concentrations

| Sl. No | IBA Treatment | No. of cuttings Treated | No. of cuttings rooted | Remarks |
|--------|---------------|-------------------------|------------------------|-----------------|
| 1. | 500 ppm | 100 | - | No rooting |
| 2. | 2000ppm | 100 | 4 | 4% rooting was |
| 3. | 3500 ppm | 100 | 38 | 38% rooting was |
| 4. | 5000 ppm | 100 | 13 | 38% rooting was |
| 5. | 6500 ppm | 100 | - | - |
| 6. | 8500 ppm | 100 | - | - |

Results and Discussion

The temperature and humidity were maintained regularly and observations were made at weekly intervals. Root initiation was observed on 20th day and formation of prominent roots were observed after 35 days. The cuttings were kept upto 60 days. The percentage of rooting was different at different concentrations which is presented in Table 1.



Fig.1 & 2: Rooted Cuttings of *Ailanthus Excelsa*

The rooting percentage was more in the 3500 ppm concentration of IBA (38%) followed by 5000 ppm (13%) and 2000 ppm (4%) respectively. Callus formation was observed in the cuttings treated with 6500 ppm where as in 8000 ppm, no callus was formed. Hence the ideal concentration for inducing maximum rooting of *Ailanthus excelsa* was found to be 3500 ppm of IBA.

Conclusion

Due to the importance of *Ailanthus excelsa* in afforestation programmes, particularly reclamation of wastelands and various difficulties like collecting the seed, low viability of seed, experiments were conducted to standardize the rooting of the branch cuttings of *Ailanthus excelsa* roxb. [6] at RFRC, Mulugu A.P. The present study revealed concluded that 3500 ppm of IBA concentration is most suitable for obtaining maximum rooting in the stem cuttings of *Ailanthus excelsa*.

References

- [1]. Gamble, J.S. 1986. Flora of Presidency of Madras. Bishen Singh Publishers, Dehra Dun. Vol-1 to Vol-3.
- [2]. Multipurpose Trees and Shrubs. 1991. ICFRE Publication, India. vol .16.
- [3]. Forestry Seed Manual of Andhra Pradesh. 1992. Andhra Pradesh Forestry Department. AP, Hyd.\
- [4]. Sagawal. S. S. 1994. Trees on marginal lands: afforestation techniques and systems. Scientific Publications. Jodhpur, India.
- [5]. Vogt. K. A. 1995. Field guide to the identification propagation and used of common trees and shrubs of dry land Suda, SOS Sahel International, Oxford, UK. ISBN 1901459152.
- [6]. Sharma, N. and U. K. 2003. Vegetative propagation of *ailanthus excelsa* through stem cuttings. *Forest*, 39: 299-308.