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Beyond Classical Approaches

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EFFECTS OF HEDGING AND ROOTING HORMONES ON ROOTING OF CUTTINGS FROM *DRYOBALANOPS BECCARII* DYER

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ABSTRACT

This study found that rooting success of stem cuttings without treatments of rooting hormones was 94.44% for first hedging and then decreased to 33.33% for third hedging. The interactions between hedging order and rooting hormones was significant for IAA and 1-NAA and conversely for 2,4-D and IBA. Results showed that none of rooting hormones tested were significantly different with respect to the levels of concentration. The hedging order did appear to influence the cull rate and shoot growth of the stem cuttings of Dryobalanops beccarii. Cuttings from first to third hedging grew more orthotropic. It was thus support the idea that plagiotropism is function of maturation since hedging had been retained the cutting plants in juvenile state.

Keywords: hedging, plagiotropism, maturation, rooting hormone

INTRODUCTION

Maturation state has a great problem with vegetative propagation. According to Fortanier and Jonkers (1976), ageing in plants has three aspects, a chronological, an ontogenetical and a physiological one. Ontogenetic ageing or maturation is genetically programmed process of phase changes. Maturation has morphological, physiological, biochemical and genetic consequences. However, these aspects have differing weight in plant species.

Methods developed that slow but do not halt maturation include cultural and chemical treatments of the donor plants, repeated regrafting, tissue culture, hedging and serial propagation (ST. Clair *et al.*, 1985; Pierik, 1990). Hedging is an option followed in programs with Norway spruce in Scandinavia. Complete rejuvenation is only attained during meiosis, but there is evidence to show that flower tissue can be used to induce somatic embryogenesis in hardwoods (Jörgensen, 1989). Through micropropagation and subsequent cryopreservation of somatic embryos, genotypes may be stored in a juvenile state for future breeding needs when testing results are available for the same clones (Jörgensen, 1990). However, such techniques are prohibitively expensive for full-scale practice.

Benefit of auxin application in promoting adventitious root development of stem cuttings have been reported (Leakey *et al.*, 1982; Hartmann *et al.*, 1990; Aminah *et al.*, 1995; Tchoundjeu and Leakey, 1996; Lo, 1985; Ofori *et al.*, 1996; Wolf and Jaenicke, 2000). However, the cuttings derived from the young stock plants did not benefit from the application of any rooting hormone tried. It can be seen in Sitka spruce cuttings form 1-year-old stock (Morgan and Mason, 1993). It is therefore application of rooting hormone with this stocktype is not recommended. However, rooting of Sitka spruce from 2-year-old stock plants was improved slightly with rooting hormone, using 5,000-10,000 mg/L IBA depending on extent of lignification.

This report describes the rooting response and first year growth of cuttings gathered from 9-month-old ortet. The purpose of this study was to provide information on the effects of hedging and different levels of rooting hormones (i.e. IBA, IAA, 1-NAA and 2, 4-D) on reinvigoration of cuttings as demonstrated by increased rooting capability, shoot growth and growth habit.