EFFECTS OF HEDGING ON MATURATION IN LOBLOLLY PINE: ROOTING CAPACITY AND ROOT FORMATION

By

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ABSTRACT

Maturation in woody plants refers to an age related process that results in changes which may be expressed in morphological characteristics, physiological properties and the ability to regenerate plant parts. Various aspects of maturation in conifers and its implications for vegetative propagation and clonal forestry systems are reviewed.

Three quantitative rooting experiments were conducted to investigate whether juvenility in loblolly pine can be maintained through hedging in up to 7-year-old donor plants of two superior full-sib families. Experiment 1 showed significant effects of hedge age on rooting percent. However, results did not clearly indicate a maturation effect since cuttings from 5-year-old donors rooted better than those from older or younger stock plants. Experiments 2 and 3 found no significant differences in rooting among cuttings from 3- to 7-year-old hedges. Significant family effects accounted for a large proportion of the total variance in all experiments.

The rooting process for cuttings from seedlings, from different aged hedges and from 3-year-old trees was investigated histologically. Anatomical changes associated with callus formation, root initiation and development of adventitious roots are described and illustrated with micro-photographs. These observations suggest that the formation of roots and the timing of root development is similar in cuttings of all donors except those from 3-year-old trees. The latter showed less callus development and little root initiation within a period of 12 weeks.

It is concluded that the use of hedged loblolly pine stock plants is a means to delay effects of maturation on rooting for at least 7 years.

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