Clonal Replacement as a Tool for Seed Orchard Managers

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Topgrafting scion from selective genotypes of loblolly pine (*Pinus taeda* L.) into the crowns of sexually mature seed orchard ramets (interstocks) has been extremely successful in producing both female and male strobili one to two years following grafting. The objective of the current study is to test the feasibility of using topgrafting to replace all or much of the crown of ramets in loblolly pine seed orchards. While there are numerous advantages of clonal replacement to a seed orchard manager, the big question remains - can we afford to do this? In order to develop a detailed economic analysis it is vital to determine the total cost of the operation. In order to do this the following data is needed; 1) scion quality, 2) number of grafts per tree, 3) interstock effects, 4) graft survival, 5) annual flower counts and the number of cones harvested, 6) time required to topwork each tree, and 7) time required for crown management of the grafts to keep the topworked scions dominant.

Clonal grafting survival was significantly different and ranged from 17 to 73% with a mean of 54%. Grafting survival also significantly increased as the quality of the scion increased. Flower production was significantly effected by both the topgraft clone and the interstock. Female strobilus production by clone and interstock ranged from 0 to 13.3 and 1 to 21.9 flowers per graft, respectively. Male catkin cluster production was not significant by clone, but was significant by interstock and ranged from 0 to 5 cluster per graft. The biological and economic significance of these results will be discussed.

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