

Seed Sizing: Do big seed perform better?

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Abstract. Loblolly and slash pine are the two most common bareroot species grown in the south accounting for 70% of all seedlings produced. Seed sizing is a common practice used by nursery managers to increase seed efficiency of expensive genetically-improved seed and to produce a uniform crop. In order to minimize differences in germination and early growth, some nurseries separate fast and slow-growing families for sowing, while other nurseries separate seed into different size categories. Results of a survey for 53 southern nurseries are used to quantify the different sizing and sowing practices used. Each sowing strategy is discussed in respect to current research results. Ninety percent of all nurseries surveyed sow seed sizes separately. The other ten percent purchase only one seed size. Most of these nurseries preferred larger seed. The five most common reasons given for sowing separately were: 1) uniform germination, 2) consistent early growth, 3) more precise planter calibration, 4) better management units and 5) fewer culls. Many nurseries have no specific sowing order for different sizes. However, some nurseries do follow a distinct sowing pattern in which they plant small seed first, then medium, large and jumbo with a lapse of up to one day between planting each size. An alternative strategy is to sow seed sizes separately within individual family blocks. While only 20% of the nurseries block by family, the majority of these do sow sizes separately within a family block. When asked whether larger seed either germinate faster or produce a larger seedling, over 78% of the nursery managers responded that there is a difference in speed of germination with larger seed germinating fastest. Nursery managers reported, however, that smaller seedlings could catch up to larger seedlings by 16 weeks if cultural practices were modified. Research results are contradictory with some studies indicating that initial seed size is correlated to germination rate, seedling size and plantation height at five years, while others do not find any relationship. Laboratory research has tentatively established that earlier germinators produce larger seedlings. The pattern that emerges in several studies is that the first 40% of seed which germinate will produce the largest seedlings after 11 weeks. Family differences do exist in seed size and germination patterns. Within a family there is a tendency for a higher percentage of seed to fall within one size class. When slow and fast-germinating clones are sown together, the slower-germinating family has a much higher number of culled seedlings. Sowing by individual family block significantly reduced the cull percentages for slow-growing families. While larger seed do appear to have an edge on other seed sizes in initial germination and growth, the genetic or biochemical basis for this apparent advantage has not been clearly defined. To summarize, three findings from the survey should be considered by nursery managers: 1) sowing seed sizes separately is a legitimate practice which has substantial support from research findings, 2) the pattern of larger seed germinating first and producing larger seedlings needs to be investigated further and 3) sowing seed sizes separately within family blocks may produce the most uniform crop, although not many nurseries currently use this strategy.