

## SUMMARY OF DISCUSSIONS ABOUT SEEDLING QUALITY

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Abstract.--Presentations reflecting several groups' concepts of seedling quality are summarized. The general consensus was that genetic factors, the morphological and physiological characteristics of planting stock, and planting site factors influence seedling quality.

Additional keywords: loblolly pine, *Pinus taeda*

At the Eastern Session of the 1982 Southern Nursery Conference in Savannah, Georgia, workshops assessed the participants' opinions of what constitutes a quality southern pine seedling. The workshops generated a list of characteristics indicative of a quality loblolly or slash pine seedling (Brissette and Lantz 1983). The primary emphasis among the groups was on morphological characteristics, and the groups' definitions of morphological quality following closely the seedling grades developed by Wakeley (1954). A major difference of opinion resulted over whether field performance is the ultimate measure of seedling quality. About one-half of the groups agreed it is while the other half felt seedling quality must be assessed at the nursery. They argued that such factors as lifting, storing, and handling--while certainly affecting field performance--do not actually impact on a seedling's inherent quality.

Because of the interest expressed in the topic of seedling quality at the Savannah meeting, a similar workshop was scheduled for the Western Session of the 1984 Southern Nursery Conference in Alexandria, Louisiana. As in Savannah in 1982, the objective was to stimulate thinking and discussion about the meaning of seedling quality. After reviewing a brief introduction to literature on seedling quality, the participants divided into discussion groups of 6 to 8 people. A total of seven groups participated in two sessions of the workshop which were held concurrently with other nursery topics. Each group developed its own concept of seedling quality and then presented the concept for discussion by the other groups in their session.

### DISCUSSION

The groups in Alexandria had fewer divergent opinions about seedling quality than did the groups in Savannah. Essentially, all the groups in Alexandria agreed with the concept that the ultimate measure of seedling quality is field performance. However, the role of site characteristics on seedling performance was also stressed by the groups in Alexandria.

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As in Savannah, morphological characteristics were of prime concern. Root-to-shoot ratio, seedling height, root collar diameter, terminal bud condition, and presence of secondary needles were all described as important indicators of loblolly pine seedling quality. Several groups stated that a desirable root-to-shoot ratio is 0.5 by dry weight and one group included 1.25 by volume. One group also concluded that the root-to-shoot ratio should vary depending on the intended planting site, with a higher ratio needed on more droughty sites. Seedling height was discussed in detail. The recommended heights also varied with intended planting site, and ranged from 10 to 30 cm (4 to 12 in.). Shorter seedlings were recommended for harsher sites. A root collar diameter of 3 mm (1/8 in.) was recognized by all the groups as an absolute minimum for planting. This is the same diameter used by Wakeley (1954) to distinguish between plantable and cull loblolly and slash pine seedlings. A dormant winter bud, secondary needles, and absence of insect and disease were also described as highly desirable traits of quality planting stock.

Physiological attributes of seedlings were discussed more by the groups in Alexandria in 1984 than in Savannah in 1982. Root growth potential (RGP) was the physiological characteristic most discussed. Other physiological traits discussed were: Degree of hardening (measured by number of chilling hours received), nutrient levels (especially potassium), and appropriate level of moisture stress. Unlike their dealing with morphological characteristics, none of the groups was able to recommend specific levels for any of the physiological traits.

The interactions between seedling genotype and storability and between genotype and performance on particular sites were also discussed by several groups.

#### SUMMARY

The two sessions of the seedling quality workshop held in Alexandria resulted in interchange and discussion among people concerned with various aspects of artificial regeneration. Perspectives were presented by nursery managers, foresters, geneticists, physiologists, and program administrators. While there is a fairly clear consensus of what a quality seedling should look like, there are growing concerns for how the seedling functions and how to evaluate seedling physiological quality. The widespread planting of genetically improved stock has generated interest in how different genotypes react to such factors as living date and storage conditions.

One group defined a clear goal for southern pine reforestation programs: 95 percent survival and a doubling of height at the end of the first growing season. The genetic, morphological, and physiological characteristics of planting stock must all be optimized to achieve such a goal.

#### LITERATURE CITED

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