

Skilful Lifting Technique Increases Seedling Survival

By O. Gordon Langdon
Southeastern Forest Experiment Station

Nursery lifting of pine seedlings may have considerable influence in survival of field plantings. A cooperative study in south Florida has demonstrated that lifting technique can be an important factor in getting good survival under adverse weather conditions. Unfortunately, damage done in lifting often is difficult to detect and usually is overlooked. Performance of machine lifters should be checked frequently to assure that seedlings are not being damaged in this operation.

The south Florida study compared machine and shovel-lifted seedlings from a single nursery bed and showed a substantial advantage for the latter. Of the seedlings carefully lifted by

shovel, 60 per cent were alive one year after planting, whereas only 41 per cent of the machine-lifted seedlings had survived.

The explanation of this highly significant difference lies in the condition of the short, feeder roots after lifting. The roots of the shovel-lifted seedlings were cut off sharply and most of the secondary rootlets on the lifted portion were intact. The machine-lifted seedlings generally were toppled over and pulled slightly through the soil during the lifting. This stripped off many of the secondary feeder rootlets.

These secondary rootlets play an important part during the initial estab-



FIGURE 1.—Machine lifter in operation at the Keri Nursery, The Atlantic Land & improvement Company, La Belle, Florida. This operation receives close supervision by Robert E. Byrd, Forester for the company.



FIGURE 2.—Pulling seedlings from nursery bed after being undercut by machine lifter, Keri Nursery.

lishment of the seedling after field planting. Their loss may contribute directly to the seedling's mortality.

Although the seedlings carefully lifted with a shovel survived better than machine-lifted ones, going back to that type of lifting is not advocated. Instead, this study points out the importance of and the need for close supervision of the lifting operation.

Observations in South Florida indicated that when one or more of the following conditions exist, the seedlings are being poorly lifted:

- (1) Lifter blade not sharp.
- (2) Lifter blade not set at correct depth (about eleven inches) or depth variable, with blade having tendency to ride to the surface.
- (3) Lifter blade not set at correct angle.

- (4) Tractor pulling lifter traveling too fast

When any of the above conditions exist during lifting, many feeder rootlets are being lost, which ultimately may cause lower survival in field plantings.

Soil conditions vary from nursery to nursery so that it is difficult to generalize or set specific rules which will hold in all nurseries. The best test to determine whether seedlings are being lifted properly is to compare the roots systems of normal machine-lifted seedlings with several lifted carefully by shovel from an adjacent bed. If there are fewer secondary feeder rootlets on the machine-lifted seedlings, check the performance of the machine lifters.

¹Cooperative study with the Atlantic Land & Improvement Company, The Collier Enterprise, The Florida Board of Forestry, and the Forest Service, USDA.

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