

**SOUTH CAROLINA FORESTRY COMMISSION**  
**CONTAINERIZED SEEDLING AND ROOTED CUTTINGS**

Containerized seedlings have a dynamic role in South Carolina Forestry Commission's reforestation effort. By using containerized seedlings, planting periods can be changed to accommodate changing weather patterns. Also, containerization of certain species can greatly improve planting survival.

In the fall of 1983 the South Carolina Forestry Commission initiated a containerized seedling program. This program came in response to requests made by South Carolina landowners for the State Forestry Commission to provide them with containerized loblolly seedlings. Most of these landowners owned land that is normally inundated during typical tree planting periods. Although it represents only a small fraction of the state's reforestation effort, planting of these highly fertile sites is justified by the rapid growth rates achieved by the established trees.

During the past several years, however, there has been a decline in these "wet" sites. Permanent lowering of water levels in some areas made them suitable for conventional winter bare root planting. So, although loblolly initially comprised 90 to 100 percent of species grown at our facility, with the reduction of wet land areas the percentage of loblolly has declined to thirty percent of the annual crop. Containerized longleaf now accounts for over sixty percent of annual production. Historically, survival of bare root longleaf seedlings has been poor but survival rates of containerized longleaf are high. Initial growth rates as well as rapid emergence from the grass stage are also characteristic of containerized longleaf seedlings.

Containerized seedlings are typically planted from March through June. Good survival can be achieved if trees are planted later, but plants tend to go dormant as soil and moisture levels become unfavorable during the mid-summer months. As an alternative to spring planting, the months of October and November are recommended. This early fall planting of containers does not compete with the bare root reforestation effort which begins two to three months later. Fall planting allows the seedlings to become established, especially the root systems as cooler soil temperatures promote root proliferation. During the following growing season, the well established root systems can sustain vigorous vegetative development.

**SOUTH CAROLINA CONTAINERIZED SEEDLINGS GROWING PROCEDURES**

**Our procedures for establishing and growing containerized seedlings are highly labor intensive. Since our program is relatively small (500M seedlings per year), and we have access to an excellent labor pool, the decision was made not to automate the operation.**

### Growing Medium

Components of our growing medium are:

40% peat moss  
40% vermiculite  
20% perlite  
3oz./cu.ft. Osmocote 18-6-12  
.5oz./cu.ft. micromax trace elements

Medium components are thoroughly mixed in a portable cement mixer.

### Seedling Containers

The containers we use are plastic with 45 cavities per tray. Cavity volume is 6.75 cu. in., five and a half inches deep. Seedling density is 53 per square foot. The containers are filled by hand to assure uniform medium density, sample filled containers are weighed to assure they are at acceptable levels, then transferred by hand to growing benches. Then the medium surface is indented to provide a suitable site for seed. Seeding is also done by hand. Two seed are placed into each cavity and slightly covered with medium. An automatic mist system is operated until 90 percent of the seed have germinated, then a regular regimen of watering begins. Again, sample trays are weighted to assure that the medium moisture level is maintained at 70 percent of the saturated weight.

Seedlings are normally grown for six to seven months and are then available for shipment to landowners. The SC Forestry Commission produces two containerized crops per year. The first is seeded in mid April and the second in November. The spring crop is grown in an outdoor slat house; the fall crop grows in a fully controlled greenhouse.

### Future of containerized seedlings

**During the past twenty years interest in planting containerized seedlings has varied. Initially, containers were presented as a panacea for all reforestation problems. However, although there have been many successes with containerized seedlings there have been a number of failures. Perhaps the chief cause of failure is the planting of seedlings at the wrong time of year. A second factor is improper planting techniques. A major misconception about containerized seedlings is that they can be planted anywhere, at any time. Soil conditions, especially moisture levels, are almost as important to monitor when planting containerized as when planting bare root seedlings. Also, the logistics of handling and moving the containers can be a nightmare. If the weather patterns of the last several years indicate permanent changes, the future of containerized seedlings appears promising. Bareroot seedlings planted in winter and early spring will be even more prone to mortality. Even if seedlings survive the planting operation, adverse conditions will probably cause them to become dormant. Normally they would then remain in the dormant state until the next growing season, effectively losing a full year's growth. Planting containerized seedlings during the late summer and early fall months could solve the growth loss problem. As discussed earlier, the cooler soil temperatures promote root development and seedling establishment. The following growing season the well established seedlings will be able to sustain height growth.**

Rooting Leyland Cypress

In addition to the regular containerized seedling project, the South Carolina Forestry Commission utilized its greenhouse and slat house facilities to produce rooted cuttings of leyland cypress. The exotic hybrid has outstanding characteristics as a Christmas tree. It is rapid growing, has dense foliage of a deep green color, and a natural conical shape.

In 1978 the Forestry Commission and Clemson University began a pilot project to develop the expertise necessary to produce Leyland cypress for distribution to the state's Christmas tree growers. Since that year, the Forestry Commission has produced over 100M rooted cuttings.

Branch cuttings are taken from source trees at three periods during the year. These periods are: spring (April); summer (July); and fall (October). The cuttings are treated with rooting hormone and placed into rooting medium under an automatic mist system. Root initials begin to appear after four to six weeks. Cuttings are normally ready to ship in five to six months.

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