

INUNDATION DAMAGE TO LOBLOLLY PINE SEEDLINGS

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One of the problems faced by foresters in north Mississippi is that of growing timber on land intermittently flooded. More than 150,000 acres within the Arkabutla, Enid, Grenada, and Sardis reservoirs may be covered with water in time of flood. Additional acreage to be intermittently flooded lies within the impoundment areas of the 650 floodwater retardation structures under construction by the Soil Conservation Service near the headwaters of small creeks. Much of this land is best suited to-growing pine. The key to its management for pine lies in the length of time that reproduction can survive inundation.

The effect of flooding on seedling survival was studied during 1958 at the Tallahatchie Research Center, in Oxford, Miss. In January, 240 1-0 loblolly pine seedlings were individually potted in No. 10 cans. Starting on February 26, groups of 10 seedlings were submerged or flooded to 1 inch above root collar in a pond for periods of 2, 5, 10, and 15 days the object being to simulate dormant-season flooding. Additional seedlings were similarly treated during the growing season, starting on May 13. Check seedlings were kept at the edge of the water for the duration of the related flooding or submergence treatment.

Noonday water temperatures during the winter ranged from 48° to 62° F. and averaged 55° F. Water temperatures in May were from 65° to 81° F, and averaged 79° F. Samples of water taken in February contained 5 p.p.m. of sediment; those in May, 72 p.p.m. of sediment.

Seedlings submerged for 15 days during the winter emerged in fine shape and with good color but had been damaged somewhat by muskrats. Seedlings submerged for 5 or more days during May were covered with slime and frog eggs and so limber as to be easily broken in handling. When the dormant seedlings were removed from the water in March, they were allowed to stand in full sunlight. Those removed in May, -during the growing season, were placed in-the shade immediately; it seems likely that mortality would have been heavy had this second lot been allowed to stand in the hot sun for a day or two, but additional tests will be needed to prove it.

Three months after they were taken from the water, seedlings inundated in February had survivals ranging from 80 to 100 percent. Survival of seedlings inundated in May varied from 75 to 100 percent. No statistically significant differences in survival can be attributed to season, depth, or duration of flooding, or to any of their interactions.

Thus, loblolly pine seedlings in this study successfully survived 15 days of complete submergence during both dormant and growing seasons. Additional studies have been installed to pinpoint the lethal period of submergence of 1-0 stock and for newly germinated seedlings as well.