

**IMPACT OF ACORN MOISTURE CONTENT AT SOWING ON GERMINATION AND
SEEDLING GROWTH OF WHITE OAK AND NORTHERN RED OAK**

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Acorn quality is an integral part of artificial oak regeneration. Progeny from individual mother trees of similar geographic areas frequently exhibited a wide range of germination percentage. The purpose of our study was to evaluate the impact of acorn moisture content (MC) at sowing on germination and subsequent seedling growth.

Acorns from ten mother trees each of white oak (*Quercus alba* L.) and northern red oak (*Q. rubra* L.) were collected locally and from south Georgia in October 2002. Mean acorn MC for white oak and northern red oak were 48 percent and 39 percent, respectively. Acorns were stored at 4° C until air dried on a laboratory bench in late November. White oak acorns were air dried for 2, 4, and 7 days to reach 40 percent, 30 percent, and 20 percent MC, respectively. Some white oak acorns had radicles protruding prior to air-drying treatments.

It took northern red oak about 1.5, 4.5, and 9 days of drying to reach 35 percent, 25 percent, and 15 percent acorn MC, respectively. All acorns were sown in early December. By early April, both species had finished germination. White oak acorns of 48 percent, 40 percent, 30 percent, and 20 percent MC had germination percentages of 70, 46, 12, and 1.4 percent, respectively. Except for the lowest MC level, northern red oak germination was not affected much by acorn MC at sowing. Acorns in the 40 percent, 35 percent, 25 percent, and 15 percent MC groups had germination percentages of 83, 79, 68, and 46 percent, respectively. In general MC at sowing had no affect on first year growth of either species if they germinated. Moreover, about 40 percent of northern red oak seedlings in each MC group met our outplanting criteria which are 70 cm height, 8 mm root collar diameter, and 5 first-order lateral roots for both oaks. Except for the lowest MC group, only 13 to 17 percent of white oak seedlings met the outplanting criteria.

A second white oak acorn MC study was implemented in fall 2003 and all acorns were sown before any radicle protrusion occurred. The treatments included air drying acorns to 33 and 25 percent MC and non-drying controls (48 percent MC). Before sowing, half of the acorns in each MC group were soaked in water for 48 hours to raise their MC to 46 to 50 percent. Germination percentages were 91, 48, and 19 percent for controls, 33 percent MC, and 25 percent MC, respectively. Soaking increased germination of 33 percent MC acorns to 70 percent and 25 percent MC acorns to 34 percent but did not affect the controls.