

PREScribed BURNING HAS LITTLE EFFECT ON LONGLEAF PINE WOOD QUALITY

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EXTENDED ABSTRACT

Longleaf pine (*Pinus palustris*) plays a vital role in the economy and ecology of the Southeastern United States. Prescribed burning is an important tool for perpetuating the longleaf pine ecosystem (Van Lear and others 2005); however, surprisingly little is known about how its repeated use affects important aspects of wood properties. Developing this knowledge is important because trees that contain the highest amount of latewood, wood density, and specific gravity will be the most valuable to the producer of structural lumber products (Jane 1970).

In 1973, a study was established to study the effects of prescribed fire on longleaf pine overstory growth at the Escambia Experimental Forest in Brewton, AL. The study was conducted in three pole-sized stands averaging 500 trees ha⁻¹. Each stand was segmented into 1.2-ha blocks and further subdivided into 0.10-ha plots. Plots were randomly assigned a treatment combination examining the effects of fire seasonality (winter, spring) and frequency (0, 2, 3, 5 years). Within each plot (n = 29), we sampled 10 trees (n = 270 total across all treatments) selected in a stratified random design across crown classes (dominant, codominant, intermediate). From each sampled tree, one 5-mm core was extracted from bark to pith. The cores were then placed in straws and transported back to the lab and stored in a freezer at 0 °C until processing. Each core was oven dried at 16 °C until mass remained constant and glued into 2-mm core mounts with a 2-mm spacer. Cores were placed in a conditioned chamber at 22 °C and 52 percent relative humidity to achieve an approximate wood moisture content of 10 percent. We then scanned the cores on a Qtrs-01x tree ring scanner (Quintek Measurement System, Knoxville, TN) with a 0.06-mm radial strip step resolution. The instrument was calibrated to express specific gravity for longleaf pine on an oven-dry weight and green volume basis (basic specific gravity). Latewood was differentiated from earlywood using a threshold specific gravity value of 0.048 (USDA Forest Service 1999). Differences in treatments were examined with a mixed-effects analysis of variance. Separate models were run examining the influence of fire return interval, canopy position, fire season, and the interaction between fire season and fire return interval. Plot was considered a random effect in the model.

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Preliminary results suggest that fire return interval, canopy position, fire seasonality, and the interaction between fire seasonality and burn interval had negligible effects on wood specific gravity. Similarly, burn interval, fire seasonality, and the interaction between fire seasonality and burn interval had no effect on latewood ring width. In contrast, canopy position significantly influenced latewood ring width, as dominant trees added statistically more latewood than codominant and intermediate trees. Collectively, these preliminary results demonstrate that prescribed burning in the spring and winter at frequent intervals had little impact on longleaf pine wood quality. Consequently, land managers burning within the range of conditions examined here will have minimal impacts on the structural integrity of longleaf pine.

LITERATURE CITED

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