PERFORMANCE OF FOUR HARDWOODS ON A GOOD PREHARVESTED SITE, WITHOUT WEED CONTROL, TREATED WITH FIRE BEFORE PLANTING AND WITH AND WITHOUT TREE SHELTER

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The performance of four hardwoods, black walnut (J*uglans nigra* L.), northern red oak (*Quercus rubra* L.), white oak (*Q. alba* L.), and cherrybark oak (*Q. pagoda* Raf.), is being studied on an upland landform in southern Illlinois. The soil is a deep (solum thickness > 160 cm or 63 in), well drained Alford silt loam (fine-silty, mixed mesic Typic Hapludalfs) occupying slopes ranging from 6 to 18 percent. Merchantable trees were harvested, and all remaining trees, shrubs, and grapevines (*Vitis* spp.) were removed manually. No other site preparation was done until 2 years later when it was estimated that forest floor vegetation was sufficient to support a sustained fire to kill most of the regeneration. The area covered by the burn was inconsistent and will not be discussed further.

Seedlings were planted in rows spaced at 2.43 m (8 ft) apart and 1.8 m (6 ft) apart within rows. The six treatments included 1) control; 2) tree shelters (clear and amber in color); 3) tree mats (1.2 by 1.2 m or 4 ft by 4 ft) alone, and in combination with each other; 4) tree shelter x tree mat, and with slow-release fertilizer (16N-6P-8K) packet (Right Start™); 5) tree shelter x slow-release fertilizer; and 6) tree mat x slow release fertilizer. Treatments were randomized within rows. No weed control was provided nor was any precaution taken against deer browsing. The experiment was analyzed as an incomplete factorial design analysis of variance.

Nine years after planting, survival of all four tree species was better with tree shelters than without them. Except for black walnut, survival was better for trees enclosed in clear shelters than for trees enclosed in amber color shelters. One 10 g (0.4 oz) packet of fertilizer improved survival for all species. Tree mats decreased survival for all species.

Tree shelters did not affect height growth the same for all species. Ninth-year height of black walnut was not affected, but it was for red oak, white oak, and cherrybark oak. Both northern red oak and cherrybark oak were taller in clear shelters than in amber shelters. The height of black walnut, white oak, and cherrybark oak was greater with fertilizer at planting than without it. The height of northern red oak was less with fertilizer than without fertilizer. Trees with tree mats were shorter than trees without them.