OAK AND MAPLE STUMP SPROUT DYNAMICS IN RESPONSE TO THINNING AND BURNING TREATMENTS IN SOUTHERN OHIO

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Three southern Ohio sites (REMA, Tar Hollow, and Zaleski) are the focus for testing the efficacy of thinning (T) and the combination of thinning and burning (TB) on oak regeneration. In T and TB stands, sprouts on stumps (≥ 10 cm diameter) are an important component of regeneration dynamics. Thinning treatments, which reduced basal area by about 30 percent, were completed in winter-spring of 2000-2001. Stands were burned in March-April 2001. During 2004, we evaluated the density and growth of stump sprouts in sixteen 400-m^2 plots in each of six 20-ha treatment units. Treatment effects on red oak group (ROG = *Quercus rubra*, *Q. coccinea*, *Q. velutina*; n = 40 stumps) and white oak group (WOG = *Q. alba*, *Q. prinus*; n = 144 stumps) stump sprout density and growth were compared with their major competitor, red maple (*Acer rubrum*; n = 121 stumps). Analysis of variance showed that burning reduced the mean number of sprouts per hectare for all oaks and red maple combined. For instance, sprout densities were significantly ($P < 0.006$) lower in TB stands (491 sprouts/ha) than in T stands (875 sprouts/ha). There were consistently more red maple sprouts, which averaged 458/ha, across all six sites, compared with 62/ha for ROG species, and 162/ha for WOG species. However, these results may be related to the greater sprouting potential for smaller diameter red maple stumps, which averaged 25.5 cm (range: 10 to 50 cm) compared with mean stump diameters of 43.1 cm (range: 11 tot 73 cm) and 37.6 cm (range: 15 to 90 cm) for ROG and WOG stumps, respectively. Mean height and diameter growth for red maple, ROG, and WOG sprouts, evaluated by species group, was not significantly ($P > 0.50$) affected by treatments. The mean height of red maple sprouts, 3.3 m, was significantly ($P < 0.001$) greater than that of ROG and WOG sprouts, 2.5 and 2.0 m, respectively. Similarly, the mean basal diameter of red maple sprouts, 4.1 cm, was significantly greater than that of ROG and WOG sprouts, 2.2 and 2.0 cm, respectively. These results suggest that oak sprouts were not as competitive as red maple sprouts in thinned treatments, and that prescribed burning immediately after cutting did not improve the competitive status of oak stump sprouts.

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