OAK STUMP SPROUT HEALTH AND SURVIVAL FOLLOWING THINNING AND PRESCRIBED BURNING IN SOUTHERN OHIO

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Oak stump sprouts are an important component of regenerating oak stands in central hardwood forests. Research initiated at three locations (REMA, Tar Hollow, and Zaleski) in southern Ohio in 2001 is testing whether thinning (T), prescribed burning (B), and the combination of thinning and burning (T+B) will produce stands with sufficient advanced oak regeneration to ensure an oak component in future stands. Stands were thinned from below (29 percent reduction in basal area) 4 months prior to prescribed burning in spring 2001. Oak stump sprouts were surveyed starting in 2001 (n=117), on T and T+B treatments at each site to determine stump diameter, number of sprouts, dominant sprout height, dominant sprout basal diameter, mortal status, and causal agents, if any, affecting dominant sprout health. In spring 2002, additional stump sprouts were added to the survey (total n=318), and all were evaluated in spring and late summer 2003. Oaks were combined as white oaks (n=224), *Quercus alba,* and chestnut oak, *Q. montana;* and red oaks (n=94), scarlet oak, *Q. coccinea,* and black oak, *Q. velutina.*

Mean stump diameter for the white and red oaks did not vary between treatments ($P > 0.70$); however red oaks mean stump diameter was slightly larger, 36.3 cm compared with white oaks mean stump diameter, 33.7 cm. Mean number of sprouts per stump was not affected by treatments for red or white oaks ($P > 0.07$). White oaks produced an average of 17.1 sprouts per stump while red oaks produced an average of 13.4 sprouts per stump. Dominant sprout height and diameter growth were evaluated with a repeated measures analysis of variance. There were no treatment differences ($P > 0.19$) for height or diameter growth of red oaks from 2001 through 2003. However, for white oaks, dominant sprout height was significantly ($P \leq 0.02$) greater in T+B treatments, 199 cm, compared with T treatments, 176 cm, in 2003. Dominant stem basal diameter growth for white oaks was also significantly ($P \leq 0.02$) greater in the T+B treatments compared with T treatments in both 2002 and 2003. Sprout mortality from 2001 to spring 2002 was 22% and independent of treatment. Mortality was only 4.9% by spring 2003 and an additional 2.6% by August 2003 with no relationship to treatment. Five categories describing the most prominent causal agents affecting sprout health were identified: deer browsing, pathogens, insect injury, powdery mildew fungi, and insect injury + browsing. Frequency of agents affecting sprout health was unrelated to treatments. Powdery mildew fungi infected white oaks in 2001 and 2002, but frequency of infection was unrelated to treatments. Frequency of injury to sprouts from deer browsing decreased from a high of 26% in spring 2002 to 3% by August 2003 as spouts grew past heights where they are readily browsed.

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