DECLINE OF RED OAKS IN THE MISSOURI OZARKS: THE STORY CONTINUES

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Recent studies and anecdotal evidence indicate an increase in the occurrence and persistence of oak decline in many of the regions formerly dominated by shortleaf pine in the Missouri Ozarks. It is yet uncertain whether growth declines and tree dieback are most influenced by stand density, age, drought stress or biotic factors such as Armillaria root disease or insects. A survey of tree condition and growth rates was conducted in southeastern Missouri to ascertain which conditions may interact to predispose the current and future forests to oak decline. In order to compare individual tree growth declines, four stand-level considerations were held relatively constant: (1) species composition (2) stand density (3) cohort age and (4) site index. The upland oak-pine forests of the Missouri Ozarks have undergone dramatic and continual change since the exploitative logging period of a century ago. Within oak-dominated stands in this study, evidence such as shortleaf pine remnants or shortleaf pine stumps indicates a more prominent historic role for pine in stands occurring on upper slope positions and exposed sites. Increment cores were analyzed to establish age-structural relationships for the upland oak-pine stands. As expected, most stands are either even aged or two-aged. Dendrochronological modeling was used to establish growth declines (basal area increment) of individual trees. Tree condition and dendrochronological analysis indicate that although aspect and slope position affect site index or tree growth rate, symptoms of decline at the stand level are not exclusively associated with exposed sites. Symptoms of decline vary widely within most stands due to competitive position and tree age.

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