

EFFECTS OF SILVICULTURAL TREATMENTS ON ACORN WEEVIL OCCURRENCE IN MIXED-OAK FORESTS

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Oak regeneration failure in the hardwood forests of the Central and Eastern United States has been well documented. Strict policies of fire suppression likely have contributed to this decline by allowing shade-tolerant species to dominate the understory, suppressing the growth of oak seedlings and their subsequent release to larger size categories. What is not clear is the role that fire suppression may have played on the major oak seed predator, the acorn weevil (Coleoptera: Curculionidae). Weevils have been known to deplete a large percentage of acorns produced in a given growing season. This can result in lower seedling recruitment. The resulting low seedling density reduces the efficacy of the shelterwood-burn technique in regenerating oak stands. The purpose of this research was to determine the effects of three commonly used silvicultural treatments on weevil occurrence in mixed-oak forests of southeastern Ohio. For this study we used the silvicultural treatments of the National Fire and Fire Surrogate study at the Zaleski State Forest and Vinton Furnace Experimental Forest sites, both of which are located in Vinton County, Ohio. The treatments include: prescribed fire, thinning, thinning followed by prescribed fire, and an untreated control. We tested the hypothesis that burning in the spring reduces the number of weevils in an area by inducing mortality on the adults as they emerged from the soil, and that thinning increases weevil activity by allowing more sunlight to penetrate the canopy, thus increasing ambient temperature. Adult weevils were captured using insect traps; acorns traps were used to determine the presence of larvae in acorns. Data from the insect traps support our hypothesis at the Vinton Furnace site; however, the Zaleski site had a more even distribution of weevil occurrence, signifying a possible site-by-treatment interactive effect. Results of this study show that fire suppression may negatively affect oak regeneration by allowing a greater occurrence of acorn weevils in a stand, thus reducing the number of new oak seedlings.

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