

EFFECTS OF FUEL REDUCTION TREATMENTS ON SOIL NITROGEN TRANSFORMATION IN THE SOUTHEASTERN PIEDMONT

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The Clemson Experimental Forest (CEF) in northwestern South Carolina is one of 13 sites included in the National Fire and Fire Surrogate Study. Fuel-reduction treatments (prescribed fire, thinning, and a combination of the two) were installed on the CEF beginning in the winter of 2000-2001. The inorganic nitrogen (N) contents of the soil (KCl extractable NH_4^+ -N and NO_3^- -N) were determined prior to treatment and in 2004 and were used to calculate three measures of soil N transformation: the rate of mineralization, the rate of nitrification, and proportional nitrification. Using an analysis of covariance, it was determined that the 2004 results for N transformation were not significantly influenced by the levels of N transformation before treatment. Analysis of variance for the 2004 results showed no significant differences among treatment means, and linear contrasts for these data suggest that none of the fuel reduction treatment means differed significantly from the control means. Differences before and after treatment were not significant for all variables when paired t-tests were used. The nitrification rate increased following these treatments in the thin only and burn only plots. These analyses suggest that the treatments have had no significant detrimental effect on soil N transformation over the 2- to 3.5-year posttreatment period, and may increase the rate of nitrification.

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