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### FOREST SITE PREPARATION EFFECTS ON GEORGIA PIEDMONT SOILS OVER A 10-YEAR PERIOD.

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#### ABSTRACT

More than a quarter-million acres of forest lands in the Southeast are site prepared annually using mechanical treatments with little to no information on long-term soil sustainability outcomes. The objective of this research was to gain a first-view of the soil changes after the following integrated site preparation (SP) treatments: none (check), chainsaw felling, shear-chop, shear-chop-herbicide(hexazinone), shear-rootrake-burn-disk, and shear-rootrake-burn-disk-herbicide(sulfometuron)-fertilize. Loblolly pine (*Pinus taeda*) was planted after SP at a 1.8- x 3-m spacing. Soils were sampled before SP and 1, 2, 4, 7, and 10 years afterwards, including an adjacent unharvested area for reference in Yr 4. Soil series were Cecil, Davidson, Vance, Wilkes, and Congaree. A randomized complete block design was used with five replications of 0.5-1 hectare plots with data analyzed by an ANOVA for repeated measures. Organic carbon within the upper 30 cm was not significantly affected by SP treatments. Organic N increased in Yr 1 for all but the most intensive treatment, then all declined by Yr 7 to pre-harvest levels. Available phosphorus (P) increased significantly for two years from 40 to 150 percent with all treatments and declined to pretreatment levels by Yr 4. Significant increases in pH occurred for two years and remained elevated to Yr 10, similar to increases in available calcium, magnesium, and potassium. Bulk density decreased and macropore space increased in the upper 6 cm during the first two years and did not differ by treatment. Trends in chemical and physical properties suggest that harvesting is more influential than the range of SP treatments tested. Dramatic alterations in soil properties at a Piedmont site were not observed following a full range of SP intensities.