Native Vegetation Restoration in Existing Timber Stands

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Restoring native vegetation to the ground cover component of existing timber stands can sustain land productivity by conserving natural resources and providing an array of marketable commodities. Establishment and management of native ground cover vegetation alters surface water flow patterns and increases water soil infiltration rates, resulting in reduced soil erosion and enhanced water quality. In addition, a vigorous native vegetation ground cover, which can be maintained with very little nutrient supplementation, could enhance livestock forage potential, improve wildlife habitat and create a carbon sink for biofuel production and soil carbon sequestration.

Establishment cost and restorative value of a native vegetation community were evaluated in a recently thinned naturally regenerated 20-year-old loblolly pine stand. Native vegetation treatments include two seedbed preparation methods and four vegetation communities. Experimental design was a randomized complete block with eight treatment plots and three replications. An intermediate harvest reduced existing pine stocking density from 350 trees per acre to approximately100 trees per acre. Native vegetation establishment was initiated on March 1, 2001 and completed on April 11, 2001. Seedbed preparation methods included a mechanical treatment that combined logging debris dispersal, double pass light disking, pre-seedling culti-packing, broadcast seeding and post-seedling culti-packing, and this mechanical treatment with a chemical brush and weed suppression. Native vegetation communities included single species broadcast seeding at 10 pls lbs per acre of 'Alamo' Switchgrass, 'Lometa' Indian grass and 'Kaw' Big Bluestem, and a 1-1-1 ratio three species mixture at the same rate. After the establishment growing season, all treatment plots were burned annually in April from 2002 to 2005. During February of 2004 and 2005, biomass and soil carbon samples were collected, and tree growth has been monitored since March 2001.

The biomass harvest was completed following the translocation of stem nutrients to the roots and dry biomass yield averages for Switchgrass and Indian grass were 7,000 and 3,700 lbs per acre, respectively. Big Bluestem was negligible and its abundance was still widely scattered after four growing seasons. Surface soil root mass increased significantly in the Switchgrass treatments. Annual burning without biomass removal severally damaged pine crowns in the Switchgrass treatments resulting in 5 to 10% mortality rate. Establishing Switchgrass in young pine plantations could create a carbon sink capable of annually sequestering 14,000 lbs of dry biomass per acre.