Abstract

Quantifying the role of Native Warm Season Grasses in Sequestering Soil Organic Carbon

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A study was initiated at the USDA-NRCS Cape May Plant Materials Center in 1999 to quantify soil carbon sequestration changes with the conversion from a cool season grass to native warm season grasses in a sandy, coastal plain soil (Downer sandy loam). Five native warm season grasses ('Shelter' switchgrass (*Panicum virgatum*), 'Atlantic' coastal panicgrass (*Panicum amarum var. amarulum*), 'Niagara' big bluestem (*Andropogon gerardii*), indiangrass (*Sorghastrum nutans*) and 'Pete' eastern gamagrass (*Tripsacum dactyloides*)) were no-till drilled into a spray-killed tall fescue/red fescue sod. The plots are 16' x 20' and replicated 4 times. Soil cores were obtained to 36 inches prior to establishment in 1999 and again in 2003 and 2010. Initial soil organic C concentrations averaged 1.7, 0.9, 0.4, 0.3, and 0.3% in the 0-2, 2-6, 6-12, 12-24, and 24-36 inch depths. The only significant increases in soil C measured between 1999 and 2003 were in the 24-36 in depths under switchgrass and eastern gamagrass and those increases were small (>0.2%). The 2003 data suggests that initial soil C concentrations in the upper 24 in of the soil profile may have already been near the saturation point for our sandy coastal soil with the previous cool season grass, but the deeper rooting of some warm season species creates the potential to increase sequestration at deeper depths where initial C concentration is very low. Evaluation of data from 2010 will also be presented and long-term implications for carbon sequestration will be discussed.