THE EFFECTS OF SOIL FERTILIZATION AND PLANT DISTURBANCE ON WIREGRASS PERFORMANCE

Abstract

Successful wiregrass restoration in Florida is a goal among state agencies and private landowners. The Northwest Florida Water Management District (NWFWMD) acquired over 40,000 acres of land, consisting mostly of pine plantation, requiring restoration to longleaf pine/ wiregrass habitat. Currently 800 to 1,000 acres are converted each year. In order to better facilitate restoration efforts, a two-year study was conducted to investigate wiregrass production strategies (clipping, burning, N and P fertilization) in order to maximize reproductive success in natural settings. The experimental plots were located on NWFWMD land as a split plot design; year 1 at Hobb's Pasture and year 2 at Hobb's Powerline. Main plots consisted of three disturbance treatments (burning, mowing, and undisturbed or control) and four fertilization subplot treatments (phosphorus, nitrogen, nitrogen plus phosphorus, and unfertilized or control). Treatment effectiveness was determined by measuring foliage production, seed head production, tissue nutrient concentration, soil mineral concentration, and mycorrhizal assessment. Plant management and fertilization affected soils, plant tissue, forage, and seed head production. The addition of P fertilization did not affect wiregrass dry mass or promote reproduction, whereas N fertilization promoted seed head production in treatments where biomass was removed (mowed or burned). Mycorrhizal hyphae occurred in approximately 70% of sampled root segments, regardless of treatment. Vesicles were located on 46% of hyphae from the mowing treatment, which was significantly greater than the control treatment at 26% of hyphae. Fertilization did not effect hyphae or vesicle occurrence. Plant management and nitrogen fertilization should be considered for enhancing wiregrass reproduction.

NWFWMD: Northwest Florida Water Management District
N: nitrogen
P: phosphorus
N+P: Nitrogen plus phosphorus