

PHYSIOCHEMICAL CHARACTERISTICS OF CAJUN PRAIRIE SOILS AT DIFFERENT DEPTHS

DOMINGO M. JARIEL*, DIVISION OF SCIENCES AND MATHEMATICS, LOUISIANA STATE UNIVERSITY AT EUNICE, P. O. BOX 1129, EUNICE, LOUISIANA 70535

BENJAMIN J. DUPLANTIS, DIVISION OF SCIENCES AND MATHEMATICS, LOUISIANA STATE UNIVERSITY AT EUNICE, P. O. BOX 1129, EUNICE, LOUISIANA 70535

MALCOLM F. VIDRINE, DIVISION OF SCIENCES AND MATHEMATICS, LOUISIANA STATE UNIVERSITY AT EUNICE, P. O. BOX 1129, EUNICE, LOUISIANA 70535

Abstract: The interaction of biota, soil and water in combination with management practices influences the development of new layers of soils in prairie ecosystems. Consequently, these interactions modify the physical and chemical (physiochemical) properties of soils at different depths. Soils of four Cajun Prairie sites in Southwestern Louisiana, two restored (Louisiana State University at Eunice {LSUE} and the Cajun Prairie Restoration Project {CPRP} in Eunice) and two remnants (Estherwood and Frey), were sampled at different depths (0-10, 10-20 and 20-30 cm) and evaluated for their physiochemical characteristics. Soil pH increased with depth ($P < 0.05$) and was positively correlated with calcium ($r = 0.55^{**}$), magnesium ($r = 0.43^{**}$) and sodium ($r = 0.30^{*}$) concentrations. LSUE prairie, which received the most intensive management practices (burning followed by mowing) annually had the highest pH value (mean = 6.1). Concentrations of silt, organic matter, potassium (K), iron (Fe), copper (Cu) and zinc (Zn) were greater ($P < 0.01$) in the surface soil (0-10 cm) than in the subsoils (10-20 and 20-30 cm depths). However, more clay was found in the subsoils than in the surface ($P < 0.01$). Greater concentrations of K, Fe, Cu and Zn in the surface than in the subsoils suggest that these elements are immobile, have greater chemical attraction with organic matter in the surface layer, and are less likely to move with water and clay to the deeper soil layers. These results refute our hypothesis that these elements would leach together with clay particles from surface to subsoil.