



USDA-CSREES 2007 National Water Quality Conference

Water quality implication of soil wetness determination for onsite wastewater treatment and dispersal

Soil colors are typically used in evaluating soil wetness for on-site wastewater systems. In general, the presence of gray, low chroma color (<2) is used to estimate the seasonal high water table or soil wetness. These colors are formed due to the reduction and subsequent removal of iron-oxide coatings from individual mineral soil grains. The low chroma colors therefore are not only a good indicator of saturated soil conditions but also of anaerobic conditions both of which are detrimental to wastewater treatment and therefore water quality. Simply using the first occurrence of low chroma colors in estimating seasonal high water table, although generally accurate, does not address the duration or frequency of saturated and reduced conditions. Soil morphological, hydrological, and physical properties from several soil toposequence on the North Carolina Coastal Plain and Rhode Island have been used to calibrate the soil color patterns to frequency and duration of water table levels and reducing conditions. The correlations suggest the use solely of 2 chroma colors may result in trench saturation for up to 50% of the year. If the trench is saturated treatment is reduced and the potential for groundwater contamination is high. Use of other morphological features, such as redox concentrations, to determine the soil wetness condition should decrease the risk of groundwater contamination.

Author: David Lindbo
University Affiliation: North Carolina State University
Co-Author(s): Mark Stolt