

# TAXONOMY OF ACID RICE-GROWING SOILS OF THE TROPICS

W.H. HUDNALL

Associate Professor, Dept. of Agronomy, Louisiana  
Agricultural Experiment Station, Louisiana State  
University Agricultural Center, Baton Rouge, Louisiana,  
USA

## ABSTRACT

Rice yields are severely reduced when grown on acid soils. Soil Taxonomy provides a systematic classification of soils based upon soil properties. The system provides to the user, through descriptive formative elements, those soil properties that are useful for management.

The purpose of this paper is to present the criteria that are used for acid soils of the tropics that are used principally for rice production. The taxonomy of wet, acid, tropical soils is presented. The sources of three kinds of acidity are used at different levels. The three sources are: 1. the decomposition of organic materials and protonation of fertilizers 2. the oxidation of sulfur, and 3. exchangeable Al.

The first kind of acidity is recognized in Entisols by reaction classes at the family level. Two kinds of sulfur-causing acidity are accommodated. Sulfidic materials are materials that have at least 0.75% sulfur. The sulfuric horizon has a pH <3.5 and jarosite mottles. In Histosols, when a sulfidic horizon that has its upper boundary within 50 cm of the surface, the soil is classified as Sulfohemists, whereas sulfidic material within 1 m area classified as Sulfihemists.

In mineral soils, sulfidic materials whose upper boundary is within 50 cm of the surface or soils with a sulfuric horizon within that depth are classified as Sulfaquents and Sulfaquepts, respectively. Sulfic subgroups are used for those situations in which the sulfidic material or sulfuric horizon is below 50 cm in Entisols, Inceptisols, and Vertisols.

Exchangeable Al is used to define the Kandic and Oxic horizons. The Allic reaction class is used with Oxisols that have  $> 2 \text{ cmol}(+)\text{kg}^{-1}$  of KCl extractable Al in some 30 cm thick layer in the control section. Alic subgroups have been proposed for Andisols and Vertisols. This subgroups have been proposed for Andisols and Vertisols. This subgroup would also be useful in Ultisol.

Tropical soils are considered as unique because of the lack of soil temperature variation. This condition has been denoted by both Tropo great groups and iso temperature regimes. Recent revisions of Soil Taxonomy have dropped the Tropo at the great group, but retained it in the family category.