PHYSICAL PROCESSES IN ACID RICE GROWING SOILS OF THE TROPICS : A REVIEW

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ABSTRACT

The main physical processes include : structural changes; gas exchange; absorption and loss of radiant energy; evapotranspiration; heat exchange between soil and heat fluxes and water movements. Soil properties, water content and puddling affect these processes drastically.

Increasing the water content of an air-dry soil, compaction, or puddling reduces the cross-sectional area of gaseous diffusion rendering a flooded soil virtually devoid of molecular oxygen. The more compact and wetter the soil the greater is its thermal conductivity.

Granulated structure, low bulk density and presence of 1 : 1 type clays favour soil water movements. Soil colloids cement primary particles into stable aggregates. Soil aggregates dominated by kaolinite and hydrous oxides of iron and aluminium are stable. Thus soil dispersion and puddling are more difficult in acid soils than in 2 : 1 type soils.