SOIL PROFILE CHARACTERISTICS DEVELOPING IN TIDAL SWAMPS, WITH SOME REFERENCES TO THEIR AGRICULTURAL SIGNIFICANCE

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*Tidal swamps are specific in several pedogenic aspects.*

As a consequence of those particular environmental factors, which among others favor the accumulation of raw organic materials and various sulphides, the tidal swamp soils can be broadly classified according to: 1) the thinness of the pat layer, if any; 2) the degree of decomposition of the peat; 3) the content and distribution of accumulated sulphidic compounds, especially pyrite; 4) the intensity of reduction and depth of the reduced mineral layer; 5) the pH of the peat and the underlying mineral layer, which in general reflects the balance between the amounts of organic acids and sulphuric acid, and that of neutralizing substances, mostly marine salts, and the buffering capacity of soil colloids; and 6) the degree of physical ripeness of the mineral layer, or the development of structure within soil mass.

The distribution with depth of each diagnostic property can be grouped into six classes. The profiles of properties, rather than either absolute values, are believed to be more important from the pedogenetic point of view. This is even true for the capability appraisal of soils.

Woody peats of more than one meter thick are considered harmful to crops, as they affect the moisture dynamics in the rooting zone, and the amount and availability of nutrients. On dessication, peats can irreversibly acquire a strong hydrophobic character. The danger of “cat” clay is not uncommon in tidal swamp areas, particularly upon the application of deep drainage as a part of many reclamation schemes. On the other hand, the depth to the intensely reduced layer will determine the affective rooting depth for crops, including the introduced improved rice varieties. A certain amount of drainage is needed to deepen the effective depth and to enhance the physical ripening of these soils, while keeping the existing potential “cat” clay layer out of becoming extremely exposed to air penetration. This can be accomplished by a tidal control system that allows only a shallow drainage of short duration at low tide, and inundating it again by the incoming high tide.

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