ACID RICE GROWING SOILS OF TROPICAL AND SUB TROPICAL CHINA

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ABSTRACT

In China rice has been cultivated for about seven thousand years and there are huge tropical and subtropical regions with aboundant rainfall where 92% of total paddy soils of China are distributed. Moreover the paddy soils in the regions can reach as high as more than 2,700 m in plateau and have total areas about 23 million ha, which produce 40% of total grain in the country. Some changes take place as to tropical acid paddy soils after rice planting which lead to firstly oxidation and reduction alternating, afterwards humus in soils accumulating, base saturation increasing and Fe and Mn leaching intensively.

For the paddy soils derived from Oxisols and Ultisols by irrigation, they change from whole profile oxidation state to surface horizon reduction and subhorizon oxidation state associated by the leaching of Fe, Mn bases and clay and their profile patterns also become A-P-Bm-C from the original A-B-C, whereas for Entisols and Inceptisols which are moistened by groundwater, after rice plating they change from oxidation to reduction in surface part due to irrigation and reduction still in lower parts due to groundwater only possible oxidation in the middle part. There is not only the downward translocation of Fe and Mn but also the upward translocation of these elements. The former is characterization of paddy soils and the later is behaviours of original soils. The profile patterns A-P-Bg-C/G is formed instead of the original A-(B)-C. As to Histosols whose groundwater and surface water mingled together, it will occur that groundwater table drops and groundwater and surface water are separated owing to drainage and application of muds after rice planting. Consequently, the uniform reduction in the whole profile is broken up, the profile pattern of A-P-Br-G will replace the A-G one. These facts indicate that the rice planting soils, no matter whatever they derived from, will be intent to form P horizon and particular B horizon relying on the conditions of reductive elliuvation and oxidative illuvation. It is the special horizon, we suggest, that can be considered as the diagnostic horizon for the paddy soil to classify it from great group level in Soil Taxonomy.

The average yield of the Chinese rice now is 50 ton/ha., but it is very uneven in various places,

somewhere only 2 or 3 ton/ha. Apart from inadequate nutrition, stagnant gleyfication, settling compaction, heavy texture and pollution are all great problems to rice production. Because cultivation land is limited and potential land resources are insufficient in China, therefore, to increase per unit area yield of padddy rice is main way to get more grain in China. If improving restrictive factors mentioned above, it is likely to raise 2.5 million ton rice in tropical and subtropical China.