PLANT-INDUCED EFFECTS ON THE BEHAVIOUR OF FERTILIZER-NITROGEN IN SUBMERGED RICE SOILS

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ABSTRACT

In the first stage of the growth period of lowland rice on acid soils nitrogen can be lost as NH_3 due to alkaline conditions prevailing in the floodwater. In this growth stage fertilizer N use efficiency can be promoted by preventing the fertilizer N from appearing in the floodwater or by using acidic N fertilizers. In this paper, information will be supplied on the relative efficiency of the fertilizer UREAS (a combination of urea and ammonium sulfate) placed at various depths (including surface application) in or on a rice soil.

A closed canopy over the water surface at the time of a topdressing can mean that the topdressed N lands into water having a pH value not conducive to NH_3 volitalization. Hydrolysis of urea could again lead to pH rises, but a rapid absorption of the resulting NH_4 by the superficial secondary root system of the rice plants can give rise to an uptake pattern in which cationic uptake far exceeds anionic uptake thus leading to a pH decline counteracting the pH increase due to urea hydrolysis. Results of an experiment on this subject will be presented.