

Title: Nitrate reductase, micronutrients and upland rice development as influenced by soil pH and nitrogen sources

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The average of upland rice under no-tillage system (NTS), a sustainable soil management, is lower than in conventional tillage (one plowing and two disking). One of the reasons given for this drop in crop grain yield would be the low nitrate assimilation capacity of rice seedlings, due to the low activity of the nitrate reductase (NR) enzyme in the early development phase. A greenhouse experiment was conducted, in order to evaluate the effects of the soil acidic and nitrogen source in the micronutrients concentration, NR activity and grain yield of upland rice growing under NTS. The soil used in the experiment was an Oxisol. The experimental design was completely randomized in a factorial 3 x 4. Treatments consisted of three levels of soil acidity (high, medium, and low) combined with four nitrogen sources (nitrate, ammonium, ammonium + nitrification inhibitor, and control – without N fertilization). The reduction of soil acidity reduced the concentration of zinc and manganese in rice plants. Generally, the activity of the NR enzyme was higher in plants grown in soils with low acidity and fertilized with calcium nitrate. There was a greater response in growth and yield in rice plants grown in soils with high acidity. Under medium acidity, rice plants grown with ammonium sulfate were more productive, (no differences were detected with the addition of the nitrification inhibitor).

Biography

A. S. Nascente has completed his PhD at the age of 42 years from Sao Paulo State University with a period in the University of Florida. He is researcher scientist from the Brazilian Agriculture Research Corporation at the Rice and Beans Research Center. He has published more than 100 papers in reputed journals and has been serving as an editorial board member of three journals.

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