

# Towards an understanding of the high productivity of rice with System of Rice Intensification (SRI) management from the perspectives of soil and plant physiological processes

## Abstract

The System of Rice Intensification (SRI) is based on a set of practices such as transplanting young seedlings and aerobic soil management during the vegetative stage without using costly external input, which attracted rice researchers because of higher yields compared with conventional flooded practices. This review assesses some field data for SRI performance in light of current knowledge about certain agronomic practices, focusing particularly on nitrate production in aerobic paddy soil and the possible effect of differences in nitrate uptake on rice growth, as this could help explain some part of rice performance with SRI. Aerobic soil environments realized with SRI management might be favorable for nitrification as well as for the expansion of rhizosphere area, which could enhance nitrate uptake and boost the yield potential of rice. The effect of nitrate uptake and assimilation under SRI practice on dry matter production should be studied comprehensively to explore the possibility of breaking the yield ceiling of rice.

Key words: paddy field, yield potential, nitrogen use efficiency, nitrate, water regime.