IRC14-1541
03j. Water, soil and nutrient management

GRAIN AND STRAW YIELD OF TROPICAL RAINFED LOWLAND RICE IN BRAZIL UNDER DIFERENT IRRIGATION REGIMES

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Purpose:

The production of rice from lowland areas with reduced water consumption has been demonstrated to be a viable altrenative in various parts of the world. The adoption of this technique requires monitoring of the conditions of organic matter mineralization, nitrification and denitrification, to know the N demand of the crop. The objective of this study was the evaluate response of rice to different irrigation regimes and doses of nitrogen under tropical floodplain conditions, during the rainy season in the savannah biome of Brazil.

Approach and methods used:

The study was conducted in the lowlands of Araguaia River (Northern Brazil). The soil was an Inceptisol. The climate is AWi, with precipitation atound 1300 mm during the rice growing season. The experimental delineation was random blocks with four replication. Plots were under five different irrigation regimes: AWDL (alternate wet and dry long: 21 days flooding followed by 7 days draining), AWDS (7 days flooding followed by 7 days draining), **CF** (continuous flooding), SS (saturated soil without flooding), and **NF** (no flooding), and no nitrogen application. Grain and straw yield were evaluated at the physiological maturity of the crop.

Key results:

F-tests demonstrated statistically significant differences b

	Grain yield		Straw yield	
		---------(kg ha^{-1}) ---------		
AWDS	7092	A	27161	A
NF	6412	A	21806	A
AWDL	6206	A	22247	A
SS	5382	AB	20580	B
CF	4360	B	19159	B
CV	19.42 %		19.84 %	
F	3.37**		10.3*	

Synthesis and Applications:

The higher grain and straw yield under less water regime may be attributed to the greater availability of N under these treatments. It is important to highlight that even NF, the rice was cultivated during the rainy season, so that there was no water limitation to crop. The greater availability of N for the AWDS, NF and AWDL regimes may be attributed to a lower rate of denitrification because the soil was not subjected to anaerobiosis for longer time, or to a greater input of endogenous N originating from the mineralization of organic materials. Greater rates of mineralization might occurs under aerobic conditions. In summary, this work indicates that, when there are no water restrictions, it is possible to achieve greater productivity of rice by adopting water savings irrigation management.