

Entry No. IRRC-0020

Category : International Rice Research Conference

Select Theme : Sustainable and equitable farming systems

Endorsement email :

Keyword 1 : Water management

Keyword 2 : Sustainable management practices

Keyword 3 :

Title of Entry : Land gradient: A field design approach to improve irrigation water use efficiency in rice

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Select only one type of presentation

: 15 minute oral presentation

Abstract

: Laser land leveling presents a potential for improved crop stand, yield, and decrease in irrigation water input. Despite the potential reduction in irrigation input, water percolation losses can still be high dependent on the nature of the soil. This study compared different levels of land gradients for their effects on grain yield, irrigation input and water productivity. The experiment was conducted in 2015 at the upland farm of the International Rice Research Institute, Los Baños, Philippines. Three field gradients (S0, S1, S2 = 0.0, 0.1 and 0.2%, respectively, in main plots) and two cut-off points (C1 75%, C2 95% in sub plots) were considered. A laser land leveler was used to establish the land gradients. The design was split-plot with 3 replications using rice variety NSIC Rc222. Irrigation scheduling followed was safe alternate wetting and drying (10 kPa at 15 cm soil depth) following establishment of the crop. Results showed that amount of water irrigated was reduced with land gradient, ranging from 22-32% less for plots with 75% cut-off point, and 18-35% for 95% cut-off point. Among all treatments, significant differences were only observed in 0.2% gradient plots. Flat plots consumed the maximum amount of water, ranging 860-1,000 mm, while 0.1% and 0.2% gradient plots ranged 670-820 mm and 580-650 mm, respectively. Differences in the irrigation volume can be attributed to the delivery of water across fields, where percolation can be high at the head or middle section of the plots with no gradient. There were no statistical differences in the grain yield caused by the slope, cut-off, and their interaction, ranging from 2.12 to 2.68 tons per hectare. Crops grown on gradient plots had more irrigation water productivity (WPI) but were statistically similar to other treatments. The results of this study indicate field designing with appropriate gradient is an option to improve water use efficiency.

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