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Improving the water productivity of paddy rice (*Oryza sativa* L.) cultivation through water saving irrigation treatments

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ABSTRACT

Rice grows well under certain condition and environment including soil, water and nutrients. Some researches have shown that traditional method with continues flooding need tremendous amount of water for rice cultivation and gives low water productivity. To increase the water productivity, number of water saving irrigation techniques have been studied and applied. Study on effect of number of water irrigation treatments on water productivity of rice was carried out. Eight irrigation treatments were conducted for growing rice in pot experiment i.e. shallow intermittent irrigation (SII), alternate wetting and drying (AWD1, AWD2, AWD3 and AWD4), shallow water depth with wetting and drying (SWD1 and SWD2), and semi-dry cultivation (SDC). The performance of those treatments in terms of agronomic and water parameters was compared to the shallow intermittent irrigation as a control method. The study reveals that the shallow intermittent irrigation needs the highest amount of water compare with other treatments. The lowest amount of water was achieved under the semi-dry cultivation. It could save water up to 18.4% compare to the control treatment. By using the alternate wetting and drying and the shallow water depth with wetting and drying treatments, irrigated water can be reduced up to 13.1% and 5.4%, respectively. The highest grain was obtained by alternate wetting and drying (AWD4) and the semi-dry cultivation yielded the smallest grain. On average the alternate wetting and drying and shallow water depth with wetting and drying increased the grain yield by 22.9% and 17.9%, whereas the semi-dry cultivation reduced the yield up to 14% compare to the shallow water depth treatment. The alternate wetting and drying treatments have significantly improved the water productivity by 41.6%, shallow water depth with wetting and drying increased by 24.2% relative to the shallow intermittent irrigation treatment, whereas the most saving water treatment i.e. the semi-dry cultivation performed quite similar with the shallow water depth treatment, as a result of low grain yields under the treatment.

KEYWORDS

Pot Experiments; Water Management; Wetting and Drying

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