Effects of Alternate Wetting and Drying Irrigation on the Grain Yield and Quality of Rice

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Abstract

This study aims to establish a cultivation model with alternate wetting and drying irrigation(AWD) base on stable production and grain quality of rice cultivars. We found the field irrigation requirements of the first season and second season were 8,789 m^3/ ha～14,346 m^3/ ha and 10,270 m^3 / ha～11,910 m^3/ ha, respectively in 2021 and 2022 with the conventional cultivation; the maximum irrigation requirement period founded during the field drying to heading stage. The results indicated that the yield of TT35 cultivar underground 10 cm AWD was 22.6 % lower than conventional cultivation of first season in 2021. We modified the AWD model by underground 15 cm in 2022, found that the yield of TT35 cultivar was 27.6% lower than conventional cultivation of first season, the main caused by less panicle numbers. Both yields of second season in 2021 and 2022 had no significant difference than conventional cultivation, due to the precipitation during the growth period. Howere, the brown rice rate, milled rice rate and volumetric weight had no significant difference under AWD, but the protein content of milled rice were decreased, the taste value were increased under AWD. Therefore, we can establishe a useful irrigation regime in addition to the AWD during the whole growth period of rice, corresponding at the different growth period, can be used as one of the effective strategies to maintain rice production and grain quality in Taitung area.

Keywords: Alternate wetting and drying irrigation, Japonica rice, Grain quality, Grain yield

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