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Development of Rice Cultivation under a Water Storage-type Deep-irrigation Regime

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In Tohoku District of Japan, river water is abundant from April to late July because of snow-melt water and rainfall during the rainy season. But in August, it decreases and water shortages occur once every several years. We are developing a water storage-type deep-irrigation regime for rice to store large quantities of water in paddy fields and delay the runoff of river water into the sea. We designed a water management system for this irrigation considering the following points (Fig. 1): (1) To enhance the water storage function of the paddy fields, the water is stored to the greatest depth possible using the present levee (maximum water depth 25–30 cm). (2) To mitigate damage from cool summer weather, the water depth at the meiotic stage is set to 25–30 cm to protect young panicles from low temperatures. (3) The water depth is increased continuously until mid-July, when water is abundant. Thereby, the depth is controlled to have only one peak, stabilizing the water supply. In this study, we compared growths and yields of rice (cv. Sasanishiki) under the water storage-type deep-irrigation plot (DP) and that under the standard irrigation plot (SP) over five years (2000–2004). In 2003, when it was cool summer weather, the yield under DP was much higher than that under SP, indicating mitigation of damage from cool summer weather. In addition, yields under DP were not inferior to those under SP during the other four years.

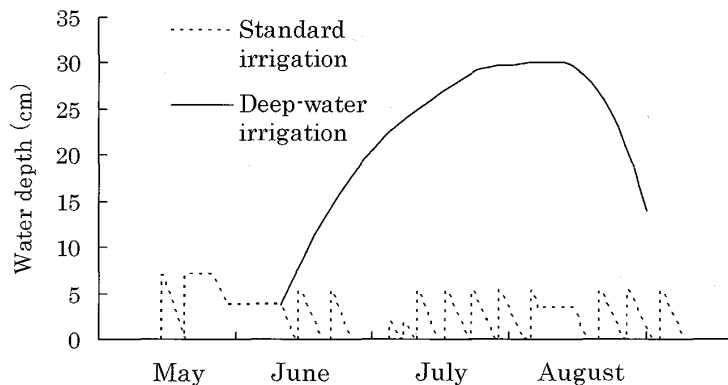


Fig.1 The standard irrigation regime in Miyagi Prefecture and the water storage-type deep-irrigation regime.