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Journal/
Society Search

GO

News



Science Links Japan

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The Crop Science Society of Japan [Info](#) [Link](#)[TOP](#) > [Journal List](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[Full-text PDF \(706K\) \]](#) [\[References \]](#)

High-Yielding Performance of Paddy Rice Achieved in Yunnan Province, China : I. High yielding ability of Japonica F₁ hybrid rice, Yu-Za 29

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Abstract:

Rice seedlings of cultivar Yu-Za 29 were planted by the conventional cultivation method with a planting density of 78.5 hills per m² (dense planting) in Binchuan, Yunnan Province and achieved a paddy yield of 1,664 gm⁻², the sampling area being 700m². In addition, a very high paddy yield of 1,982 gm⁻², the sampling area being 6m² in total of three sub-plots, was recorded by reducing the planting density to about half of the conventional one (42.7 hills per m², sparse planting). The average daily incident solar radiation during whole growing period (19.3 MJ m⁻² d⁻¹) was about 20% higher compared to the mean value (16.1MJ m⁻² d⁻¹) obtained in the five-year experiment of the Japanese International Biological Program (JIBP). On the other hand, the efficiency for solar energy utilization (Eu) of Yu-Za 29 for biological production during the whole growth period was higher by 28-50% in comparison with the average Eu (1.25%) of the five-year experiment of JIBP. Eu for grain production exceeded the highest Eu (0.59%) in the JIBP by 17-49%. In Yu-Za 29, the harvest index was estimated at more than 0.6 for top-dry weight over 2,500gm⁻² and the grain-straw ratio reached more than 1.4 for straw weight over 1,180 gm⁻². The spikelet number per m² was 71,000 to 87,700 and the filled-spikelet percentage was 76.0 to 76.2%. An increase in both components of dry-matter production and the partition ratio of dry matter to grains as well as the high percent of the filled spikelets, regardless of a very large number of spikelets, had been attained with the sparse planting comparing with dense planting.

Keywords:

China, High yield, Paddy rice, Solar radiation, Yunnan Province, Yu-Za 29

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