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Effects of the Time of Deep-Water Treatment on Growth and Lodging Resistance in Japonica Type Paddy Rice

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Abstract:
Recently sometimes deep water is used as a growth control technique in rice cultivation in Japan.To make clear the proper treatment for growth control, we studied five deep-water treatments(30cm depth)which were different in start time and period:plot A-1, from productive tiller number determining stage to internode elongation starting stage to ripening stage;and plott A-2, to heading stage;plot A-3, to ripening stage; plot B, from internode elongation starting stage to ripening stage;and plot C, from heading stage to ripening stage.In plots A-1, A-2 and A-3, the percentage of fruitful culms improved and basal internode diameter increased greatly compared to the of that control(5cm water depth maintained).However the breaking strength of basal internodes decreased as the treatment period became longer(plots A-2 and A-3).This weakening could be explained by the development of lysigenous aerenchyma and thin cortical fiber in the internode tissue.In plot B, no improvements were observed in the percentage of fruitful culms and yield components as compared with the control. But remarkable reductions in breaking strength and spindly growth were recognized in the basal internodes.The reduction in strength could be explained by the thinness of the cortical fiber and fundamental parenchyma, and a remarkable development of lysigenous aerenchyma.In plot C, little influence of treatment was observed on growth habit.These results indicate that treatment which starts from the productive tiller number determining stage to internode elongation starting stage has a possibility for rice growth control.

Keywords:
Breaking strength, Cortical fiber, Deep-water, Lodging resistance, Lysigenous aerenchyma, Rice.

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