Nongyao Kaewwiset 2010: Selection of Rice (*Oryza sativa* L.) for Higher Yield and Quality from Crosses between Tropical Japonica and Indica. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Prapa Sripichitt, D.Agr. 71 pages.

Selection of rice (*Oryza sativa* L.) for higher yield and quality was conducted by hybridization between tropical japonica rice and indica rice for 12 crosses. Tropical japonica rice had low tillering capacity, large panicles with high number of grains while indica rice possessed good grain quality including long, slender and translucent grain. The F_1 plants produced were grown in the greenhouse and the F_2 to F_3 progenies were planted in the experimental field at Pathum Thani Rice Research Center, Pathum Thani province. Selection was done in each succeeding generation from F_2 to F_3 using pedigree method for plants/lines which had high yield and good agronomic characters. Preliminary yield test of the 33 selected F_4 lines, 7 parental lines and 5 check varieties (PTT1, CNT1, SPR1, SPR2 and RD31) were conducted using augmented design in randomized complete block at Pathum Thani Rice Research Center in rainy season 2009.

The results showed that there were 15 from 33 tested F_4 lines which gave higher yield than the highest yielding check variety SPR1. They showed the yield varying from 621 to 1,035 kg/rai while the check variety SPR1 gave the yield of 615 kg/rai. However, there were 4 lines which gave significantly higher yield than the check variety SPR1, These lines were PTT07288-20-1, PTT07288-11-4, PTT07288-20-3 and PTT07288-14-2 which gave the yield of 1035, 974, 968 and 939 kg/rai, respectively. The 6 parental lines manifested the yield ranging from 127 to 573 kg/rai which were lower than the check variety SPR1. Grain physical quality and cooking and eating quality of the 15 F_4 lines were determined. It was found that there were 4 lines including PTT07288-11-4, PTT07285-21-2, PTT07266-8-6 and PTT07266-7-1 which exhibited good physical grain quality by having long, slender and clear grains or slightly chalkiness grain. However, these lines manifested variable cooking and eating quality by having medium (20 -25%) to high (25-33%) amylose content. Consequently, the texture of cooked rice varied from soft and slightly sticky to hard and loose. Selection will be done further for improving cooking and eating quality in order to meet the requirement of customers.

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