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ONLINE ISSN : 1349-1008

PRINT ISSN : 1343-943X

## Plant Production Science

Vol. 6 (2003) , No. 1 95-102

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### Effect of Plot Size on Accuracy of Yield Estimation of Rainfed Lowland Rice Genotypes with Different Plant Heights and Grown under Different Soil Fertility Conditions

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(Received: July 19, 2002)

**Abstract:** Breeding programs for rainfed lowland rice normally use large plot sizes for accurate estimation of yield. Resource requirements are reduced and more genotypes can be tested if a small plot size can be used. A total of 4 experiments was conducted at high and low soil fertility locations in Thailand to determine the influence of plot size and arrangement of tall and short genotypes in small plots on the estimation of yield of genotypes differing in height. Ten to sixteen genotypes were grown in different orders of tall and short genotypes within 2-row plots and also in random arrangements in 4-row, 6-row and 16-row plots. Results showed that taller genotypes tended to suppress the performance of the neighboring shorter genotypes. Consequently the yield results from 2-row plots, in which genotypes were randomly allocated, were unreliable at the high soil fertility location with more vigorous growth, although they were sufficient at the low soil fertility location. Thus plot sizes of 4 and 6-rows appear necessary for accurate estimation of yield across environments. However, when all short genotypes were grouped together and formed a block, and all tall genotypes grouped to form another block, yield results from 2-row plots showed a rather small effect of the competition between the neighbouring genotypes. The yield estimation was improved further by adjusting yield according to the height of each genotype by using covariance analysis. With these modifications, 2-row plots were found to be sufficient for accurate estimation of yield.

**Keywords:** [Competition](#), [Plant height](#), [Plot size](#), [Rice genotypes](#), [Selection trial](#), [Yield estimation](#)

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Suwat Jearakongman, Somdej Immark, Apichart Noenplub, Shu Fukai and Mark Cooper:  
“Effect of Plot Size on Accuracy of Yield Estimation of Rainfed Lowland Rice Genotypes with Different Plant Heights and Grown under Different Soil Fertility Conditions”. *Plant Production Science*, Vol. **6**, pp.95-102 (2003) .

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doi:10.1626/pps.6.95

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