ONLINE ISSN : 1349-1008
PRINT ISSN : 1343-943X

Plant Production Science
Vol. 6 (2003) , No. 1 28-35

Contribution of Biomass Partitioning and Translocation to Grain Yield under Sub-Optimum Growing Conditions in Irrigated Rice

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(Received: April 30, 2002)

Abstract: The International Rice Research Institute (IRRI) has developed a new plant type (NPT) and F_1 hybrids to further increase rice yield potential. In this study we compared yield and yield-related traits among four genotypic groups : indica inbreds, F_1 hybrids, NPT and NPT×indica lines; and determined the contribution of biomass partitioning and translocation to grain yield under sub-optimum growing conditions. Field experiments were conducted in 1998 wet season (WS) and 1999 dry seasons (DS) in the Philippines. Forty-seven genotypes in the WS and 46 genotypes in the DS were studied. Growth analyses were done at flowering and physiological maturity and yield, and yield components were measured at physiological maturity. Among the genotypic groups, average grain yield of the F_1 hybrids was the highest and that of the NPT lines was the lowest. Grain yield was highly associated with harvest index (HI) with an r^2 of 0.73-0.84 in both seasons. The relationship between grain yield and biomass production was relatively weak. A negative relationship was observed between *T*, the amount of biomass accumulated before flowering and translocated to the grains during grain filling and W_r the biomass accumulation from flowering to physiological maturity. The NPT lines had the highest average W_r but had the lowest *T* among the genotypic groups, which was opposite of that of the F_1 hybrids. Compared to W_r, *T* was more closely related to HI and grain yield. Results suggest that

under sub-optimum growing conditions such as low total solar radiation increasing *T* and HI is vital for achieving high actual grain yield in irrigated rice.

Keywords: Biomass production, Grain yield, Harvest index, Rice, Translocation

To cite this article:

Ma. Rebecca C. Laza, Shaobing Peng, Shigemi Akita and Hitoshi Saka: “Contribution of Biomass Partitioning and Translocation to Grain Yield under Sub-Optimum Growing Conditions in Irrigated Rice”. Plant Production Science, Vol. **6**, pp.28-35 (2003) .

doi:10.1626/pps.6.28

JOI JST.JSTAGE/pps/6.28