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## **The growth and productivity of native Indonesian rice progenies and its relationship with root development during dry-season**

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### **Abstract**

One of the problems in increasing rice production is getting lines or varieties that have high adaptability so that able to produce maximum production in a variety of environmental conditions. One strategy that can be done to get adaptive varieties is through the improvement of native varieties. This research was conducted in rain fed paddy field, Aceh province, Indonesia from June to September 2014. The texture of the soil was clay-loam with the soil pH ranged from 6.5-6.7. Five potential progenies of rice from crossing between native Indonesian rice with introduced rice varieties consist of C3, C4, S3, S5, S6 were used in this study. Besides that, one national rice variety Ciherang also used as a comparison. The plants were growth in the plot with the size of 2 m× 1.4 m with plant distance was 20 cm×20 cm. The fertilizers used in this study were Urea, NPK, and KCl. Randomized block design with 6 rice progenies/variety and 3 replications were used in this study. There were 18 experimental units and each experimental unit had 10 samples for the sources of data. The variables that were observed in this study including plant height at harvesting time, number of productive tiller, the percentage of empty grains and filled grain per panicle, weight of filled grains per hill, weight of filled grain per plot and yield potential per hectare. Analyzed were also conducted for the depth of root penetration, dry-root weight, dry-shoot weight, shoot-root weight ratio and its correlation with the weight of filled grain per hill. The research results show that there was significant difference on plant height at harvesting time, number of productive tillers, the percentage of empty grains and filled grain per panicle, weight of filled grains per hill, weight of filled grain per plot and yield potential per ha ( $p>0.01$ ) among the treatments. In addition, depth root penetration, dry-root weight, dry- shoot weight, shoot-root weight ratio also had significant difference ( $p>0.01$ ) among the treatment. The highest plant at harvesting time was found in S6, reaching 129.8 cm and the shortest plants was found in C3 reaching 107.5 cm. The largest number of productive tillers and the highest percentage of filled grains per panicle were found in Ciherang reaching 10.5 tillers and 80.7% respectively. Ciherang also had the heaviest weight of filled grains per hill and per plot reaching 21.1 g and 2.18 kg respectively. Whereas, S6 had the lowest number of tillers and the lowest percentage of filled grain per panicle.. The highest yield potential per ha was found in Ciherang reaching 7.79 tons. Among the progenies, S5 had the highest yield potential reaching 5 tons/Ha. The result also showed significant relationship between shoot-root weight ratio with weight of filled grains per hill. The highest value of shoot-root weight ratio (1.57) in Ciherang is thought had closed relationship with its yield potential.

Keywords: rice progenies, dry-season, root development, productivity

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