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Development of high yield rice of long grain type adaptable to South-East Asia tropical region

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Abstract

The long grain rice varieties adaptable to South-east Asia tropical regions were tried to develop in Cambodian Agriculture Research and Development Institute (CARDI), Cambodia. The final goal is to develop rice varieties which can culture in diverse environmental conditions of tropical regions of South-east Asia under climate change. We collected and evaluated for agronomic traits of 131 rice germplasm from Cambodia, China, India, Indonesia, Myanmar, Philippines and Vietnam in CARDI. We selected core germplasm including leading varieties of target countries and made 813 F1 cross combinations between leading varieties of each country and promising germplasm of high yield potential, resistance to biotic/abiotic stresses, aromatic rice, and so on. Out of 607 F1s evaluated to heading date, plant type, agronomic traits, and grain type, 106 F1s selected and advanced to F2 populations. 106 F2 populations were evaluated to major agronomic traits, grain type and yield-component traits, and selected 2,560 plants in 62 F2 populations. During six seasons in 2014~2016, the lines of F3 subsequent-generation were cultured a total of 6,256 lines. In yield trial for promising lines in F5 generation, the growth duration from sowing to harvesting was 97~114 days. These lines were 88~129 in number of grain per panicle, an average of 84.6% in the range of 79.3~91.9% in the percentage of ripened grain and 17.5~22.8g in 1000-brown rice weight. The rough rice yields were in the range of 4.33~6.06 ton/ha with an average of 5.23 ton/ha. The yield was increased to 5~47% than Chulsa and 12~41% than IR66. Five lines, KR54-28-1, KR55-14-2, KR57-5-2, KR67-57-2 and KR128-19-1 were 5.33~6.06 ton/ha in rough rice yield. These high yield potential lines would be evaluated to adaptability in Cambodia, Laos, Myanmar and Vietnam during 2017.

Keywords: rice, long grain, indica, tropical region, South-east Asia

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