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摘要: Three indica restorer lines (Mianhui 725, Shuhui 527, Shuhui 881), an American rice variety Lemont and a javanica rice variety Xiangdali were crossed with japonica Kitaake, and five F1 hybrids were obtained to study the photosynthetic and agronomic traits. The data on photosynthetic characteristics indicated that the net photosynthetic rate (Pn) of the five F1 hybrids was significantly higher than that of their parents (or one of them) under high photosynthetic flux density (PFD); while the overall performance of hybrids was better than their respective parents in apparent quantum yield (AQY), carboxylation efficiency (CE) and CO2 compensation point (CCP). Moreover, the photosynthetic performance of the five F1 were different due to the variation in heredity and the typical indica-japonica hybrids, Mianhui 725/Kitaake and Shuhui 527/Kitaake, were better than the others on this aspect. The agronomic traits revealed that the five F1 exhibited different heterosis, with Shuhui 881/Kitaake the largest sink followed by Mianhui 725/Kitaake, Shuhui 527/Kitaake, Lemont/Kitaake and Xiangdali/Kitaake. The production potential of indica-japonica hybrids was higher than that of the other two hybrids, which was consistent with the performance of Pn. However, the superior trait of indica-japonica hybrids on sink size has not been fully turned into high yield because of abnormal seed setting. Therefore, attention should be paid to the proper genome coordination and appropriate genetic distance so as to achieve super high yielding.

关键词: rice; intersubspecific hybrid; source; sink; net photosynthetic rate; genetic distance; heterosis

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