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Sterility of Thermo-Sensitive Genic Male Sterile Line, Heterosis for Grain Yield and Related Characters in F₁ Hybrid Rice (*Oryza sativa* L.)

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Abstract: The thermo-sensitive genic male sterile (TGMS) T29^s line was sterile when exposed to daily mean temperatures of 24.1°C or above during the critical stage (from 15 to 11 days before heading). It was completely sterile for both pollen and spikelet when the plant headed from June 16 to November 7 in Okinawa, because the temperature exceeded 24.1°C. The heterosis of the F₁ hybrids between the T29^s line and seven indica cultivars was examined. Most of the F₁ hybrids showed positive heterosis over the male parent for grain yield per plant and the number of spikelets per panicle, and one of them manifested heterosis for grain yield over a F₁ hybrid from a cytoplasmic male sterile (CMS) line. Dry matter accumulation per plant at the panicle initiation stage in most F₁ hybrids was higher than that in the respective male parent or mid-parent, and it was correlated with a larger number of tillers and leaf area per plant. All F₁ hybrids produced a larger number of panicles per plant than their respective male parent. Positive heterosis over the male parent for the number of filled grains per panicle, 1000-grain weight and harvest index was obtained in several F₁ hybrids. A positive correlation was found between grain yield and the dry matter accumulation per plant in F₁ hybrids. Both the larger number of panicles per

plant and the larger number of spikelets per panicle were more important for the positive heterosis for grain yield in F₁ hybrids rather than the higher 1000-grain weight. Among the yield attributes, a larger number of filled grains per panicle mainly contributed to a higher grain yield of F₁ hybrids.

Keywords: [Dry matter](#), [F₁ hybrid](#), [Grain yield](#), [Heterosis](#), [Sterility](#)

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