

# ESTIMATION OF HETEROSIS FOR QUANTITATIVE AND QUALITY TRAITS IN QUALITY HYBRIDS RICE (*ORYZA SATIVA* L.)

F.C. Sao\*, A.K. Sarawgi, Temin Sahu, Sourabh Paikara and Mohamad Aarif

Department of Genetics and Plant Breeding, Indira Gandhi Krishi Vishwavidyalaya,  
Raipur- 492012 (CG), India  
Email: fchandsao@gmail.com

Received-18.10.2013, Revised-25.11.2014

**Abstract:** The heterosis study on quantitative and quality traits in quality hybrids rice from line x tester analysis from 24 F<sub>1</sub> hybrids derived from 3 female and 8 male lines. The observations were recorded on 28 quantitative and quality traits. Analysis of variance revealed that all the treatments exhibited highly significant variation for almost all the traits under study. The highest heterotic effects observed for mid parents, better parent and standard heterosis were 233.33%, 97.50% and 60.14% for grain yield per plant noted for the crosses IR 58025A/R1679-1674-1-234-1. Maximum heterosis over mid parents of 313.25%, 33.67%, 26.98% and 100.15% for productive tillers per plant, panicle length, spikelet fertility percentage and harvest index and maximum heterobeltiosis of 163.64%, 29.18%, 24.54% and 43.35% for productive tillers per plant, panicle length, spikelet fertility percentage and harvest index and maximum standard heterosis of 218.68%, 21.10%, 5.89% and 49.09% for productive tillers per plant, panicle length, spikelet fertility percentage and harvest index was found in IR 58025A/R1679-1674-1-234-1.

**Keywords:** Heterosis, Trait, Hybrids, Rice

## REFERENCES

- Bisne, R. and Motiramani, N.K.** (2005). Identification of maintainers and restorers using WA source cytoplasmic male sterile lines in rice. *IRRN*, **30**(1): 14-15.
- Chaudhary, A., Sharma, P., Singh Harpal., Pradhan, S.K. and Pandey, M.P.** (2007). Study on heterosis for yield and physiological characters in rice hybrids. *Oryza*, **44**(1): 7-13.
- Gawas, Y.K., Bhave, S.G., Bendale, V.W., Sawant, S.S. and Jadhav, B.B.** (2007). Nature and magnitude of heterosis for growth yield and yield components in hybrid rice. *J. Maharashtra Agric. Univ.*, **32**(1): 52-56.
- Hossain, M.S., Zaman, F.V., Singh, A.K. and Prasad, H.** (2004). Studies on the level of heterosis in hybrids developed from *Indica/Japonica* derived lines. Proc. International Symposium on rice. Extended summaries 04-06. Oct., 2004. 133.
- Issac, S.** (2007). Heterosis for economic traits in early, mid early and very early rice cultivars for the cauvery delta zone. *Indian J. Agril. Res.*, **41**(4): 249-255.
- Kumar, A., Singh, S. and Singh, S.P.** (2012). Heterosis for Yield and yield components in basmati rice. *Asian Journal of Agricultural Research*, **6**: 21-29.
- Li, Y.J., Fang, S.H., Lu, Y.G., Li, J.Q., Chen, X.H. and Liu, X.D.** (2008). Heterosis analysis on main agronomic traits in autotetraploid rice. *Journal of South China Agricultural University*, **29**(3): 117-119.
- Mirarab, M., Ahmadikhah, A. and Pahlavani, M.H.** (2011). Study on combining ability, heterosis and genetic parameters of yield traits in rice. *African J. Biotechnology*, **10**(59): 12512-12519.
- Pandya, R. and Tripathi, R.S.** (2006). Heterosis breeding in hybrid rice. *Oryza*, **43**(2): 87-93.
- Saidaiyah, P., Sudheer Kumar, S. and Ramesha, M.S.** (2010). Combining ability studies for development of new hybrids in rice over environments. *Journal of Agriculture Science*, **2**(2): 226-233.
- Shanthi, P. Shanmugasundaram and S. Jebaraj** (2006). Heterosis in three line Rice (*Oryza sativa* L.) Hybrids. *Indian J. Agric. Res.*, **40**(3): 208-211.
- Singh, N.K., Kumar, A. and Kumar, R.** (2007). Combining ability for yield and yield components in rice. *Oryza*, **44**: 156-159.
- Singh, R.K. and Lal, J.P.** (2005). Exploitation of heterosis in aromatic rices for different physico-chemical traits. *Indian J. Genet.*, **65**: 47-48.
- Singh, R.K.** (2005). Heterosis breeding in aromatic rice (*Oryza sativa* L.) for yield and quality characters. *Indian J. Genet.*, **65**(3): 176-179.
- Singh, V., Verma, O.P., Dwivedi, J.L. and Singh, R.K.** (2006). Heterosis studies in rice hybrids using CMS-System. *Oryza*, 154 - 156.
- Soni, D.K., Kumer, A., Nag S. and Sahu, L.** (2005). Study of heterosis by utilizing cytoplasmic-genetic male sterility system in rice (*Oryza sativa* L.). *Plant-Archives*, **5**(2): 617-621.
- Tiwari, D.K., Pandey, P., Giri, S.P. and Dwivedi.** (2011). Heterosis Studies for Yield and its Component in Rice Hybrids using CMS system. *Asian Journal of Plant Sciences*, **10**(1): 29-42.
- Vaithiyalingan, M. and Nadarajan, N.** (2010). Heterosis for yield and yield contributing characters in inter sub-specific crosses of rice. *Electronic Journal of Plant Breeding*, **1**(3): 305-310.
- Veni, B.K., Rani, N.S. and Prasad, A.S.R.** (2005). Heterosis for yield components and Key quality traits in basmati rice. *Oryza*, **42**: 97-102.

\*Corresponding Author

**Verma, R.S., Yadav, R.D.S., Singh, R.S., Giri, S.P. and Dwivedi, J.L.** (2004). Studies on heterosis and inbreeding depression in rice (*Oryza sativa* L.). *Oryza*, **41**: 131-132.

**Wang, H.F., Wang, N.Y., Li, Y., Liang, K.J., Qiu, X.L., Zhou, W.Y.,** (2010). Genetic effects and heterosis analysis on yield-related traits of CMS-FA hybrid rice. *Scientia Agricultura Sinica*, **43**(2): 230-239.