

Category	: International Rice Research Conference
Select Theme	: Genetic improvement
Endorsement email	:
Keyword 1	: Hybrid rice
Keyword 2	: Genetic gain
Keyword 3	:
Title of Entry	: Identification of restorers and development of heterotic hybrids in rice (<i>Oryza sativa</i> L.)
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Rice is the most important food crop of Telangana state cultivated in around 17 lakh hectares annually. Despite highest average productivity (3902 kg/ha) recorded in the state during 2016-17, rice cultivation has become non-remunerative with ever increasing cost of cultivation. Hybrid rice has been the best proven technology for breaking the yield barrier of improved inbred varieties. In this context, 569 stable genotypes were crossed on to different stable CMS (WA) cytoplasm lines and 1146 hybrids were produced during rabi, 2016-17 at Rice Research Centre, PJTSAU, Hyderabad, India. These 1146 hybrids along with parents and checks were evaluated during 2017 rainy season to identify potential restorers and maintainers. Based on percent pollen and spikelet fertility, 335 hybrids were identified as fertile, 193 as partial fertile, 536 as partial sterile and 82 as sterile. The phenotypic data revealed that 189 genotypes (33 % male parents) were identified as restorers and 41 (7%) as maintainers. Among the available germplasm, only one third of the population could effectively be utilized as male parents being restorers. However, some genotypes recorded fertile or sterile reaction to only one CMS line and partial maintainer on others. Conspicuously, five genotypes (1%) have recorded maintainer

reaction with 100% pollen and spikelet sterility besides producing hybrids showing >75% spikelet fertility on different CMS lines. It is evident from the results that though the cytoplasm is same, the nuclear genes of male parent interact differently with the females to produce variable fertility reaction. Though strong positive correlation observed between pollen and spikelet fertility, few hybrids with less than 50% pollen fertility exhibited >75% spikelet fertility which reiterates that ovule got fertile with only one pollen grain among millions in each spikelet. Grain yield data revealed that CMS 64A x RNR 19631 (47%) hybrid recorded highest heterosis followed by CMS 64A x GPRH 289 (39%), JMS 13A x GPRH 620 (29%), JMS 14A x GPRH 365 (28%) and CMS 23A x GPRH 605 (24%) over best hybrid check, US 314 which were identified as potential heterotic hybrids for further evaluation and commercialization to increase rice productivity in the Telangana state.

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