**Climate smart management practices: DSR Consortium (Sub Project- 2.4)**

The conventional systems created problems of high production cost, low input-use eﬃciency, decline in groundwater, deterioration in soil health, and environmental pollution. The intensive use of water in conventional puddled transplanted rice (CT-TPR) cultivation in northwest IGP is depleting aquifers at the rate of 11-13 km2 annually. Therefore, it has been imperative to use conservation agricultural techniques for sustained production.

* During the kharif 2020, gapfilling increased the grain yield of both direct seeded rice (DSR) and puddled transplanted rice (PTR).
* gap filling increased grain yield of rice by 13.6% in DSR and 9.9% in PTR .
* Salinity stress resulted a grain yield loss of 10.7-14.0%, while due to submergence, the yield penalty varied between 8.3 – 11.3% depending upon the variety.
* 116 genotypes were tested for anaerobic germination and, four genotypes out of these 116 genotypes did not germinate. Germination, root length and the shoot length were measured on 15 day after sowing.
* The lines IR127795-820-1-2-1 (IQ 34) and IR127795-1020-1-1-3 (IQ 40) were identified as superior genotypes with 100% germination capacity with highest seedling vigor of 32%, followed by IR 127795-820-1-22 (IQ 35) with 98% germination and 31% seedling vigor.
* A total of 60 rice genotypes were screened by direct seeding in Kharif 2020 with plot size of 10m. Out of 60 genotypes, maximum grain yield was observed in CSR MAGIC 167 (5.61 t /ha ) followed byP ET-27 (5.52 t/ ha ), CSR58 (5.23 t/ ha ) and minimum yield was observed in CSR 62 (2.23 t/ ha ). Out of 8 DSR genotypes, maximum grain yield was observed in CSR 86 (6.19 t/ ha ) followed by CSR 88 (6.06 t/ ha ).
* The rice crop was sown during Kharif 2021 under coastal saline agro-ecosystem of the West Bengal under the diﬀerent tillage and crop establishment management scenarios.
* The highest rice yield was recorded under PTR+GP (3.59 t/ ha ) management practice and it was at par with DSR and UPTR in coastal saline soils.
* . A total of 34 genotypes whose germination was above 50% under anaerobic condition. The lines IQ 35 (IR 127795-820-1-2-2) and IQ 34 (IR 127795-820-1-2-1) were identified as superior genotypes with 83% and 78% germination capacity with seedling vigor of 25.4 and 22.6 respectively.
* At ICAR-CSSRI farm, a total of 44 rice genotypes were screened under direct seeded rice (DSR) during Kharif 2021. The average grain yield of 3.29 t/ha was observed, with minimum yield of 1035 and maximum yield of 5.21 Mg ha-1.
* Out of 44 genotypes, maximum grain yield was observed in CSR 56 (5.21 t/ ha ). CSR 56 showed the highest grain yield, followed by CSR 58 (5 t/ ha ), CSR RIL-06-178 (4.90 t/ ha ), CSR 49 (4.83 t /ha ), CSR MAGIC 167 (4.79 t/ ha ).
* At farmers field, promising new rice genotypes were tested under DSR and PTR conditions at two diﬀerent locations in Karnal and one location in Kurukshetra district of Haryana.
* CSR 88 recorded 33-49% higher yield compared to CSR 30 (4.0-4.3 t ha ) across the diﬀerent locations under DSR conditions. However, CSR 88 recorded 42% higher yield compared to PB1121 across the diﬀerent locations under TPR conditions.
* During the Rabi 2022-23, in the rice-maize cropping system, after harvest of Kharif rice, four maize genotypes (Silver, Hybrid Corn 4226 (VNR), Bio-Zenith and Hybrid Maize 8110) were sown in the place of rice genotypes.
* It was observed that the Kharif season rice tillage methods had significant effect on maize growth and yield. The kernel yield was 5.27, 5.53, 6.71 and 6.60 t/ha in PTR, PTR+Gap filling, UNPTR and DSR respectively during Rabi 2022-23.
* The maize kernel yield was significantly different among the hybrids. Kernel yield was 5.38, 5.93, 6.06 and 6.75 t/ha for Silver, Hybrid Corn 4226, HM 8110 and Bio Zenith respectively.
* At farmers’ field, 3- promising new rice genotypes compared to 3 check varieties were tested under direct seeded rice (DSR) and transplanted rice (TPR) conditions at five different districts (Karnal, Sonipat, Panipat, Rohtak and Fatehabad) of Haryana.
* Among the 6- varieties, CSR 57 recorded 13-29% higher yield compared to check variety HKR 128 (4.2-4.5 Mg ha-1) across the different locations under DSR conditions.
* However, CSR 51 (Salt tolerance) and 89 (Basmati) recorded 11-27 and 20-32% higher yield compared to check varieties CSR 36 and PB 1121, respectively across the different locations under TPR conditions.