# INTERDROUGHT 2022

## THE 7TH CONGRESS ON PLANT PRODUCTION IN WATER - LIMITED ENVIRONMENT

### FIRST TIME IN AFRICA!

## 28 NOV - 02 DEC 2022
## KING FAHD HOTEL, DAKAR, SENEGAL

InterDrought 7
2022, Dakar - SENEGAL

# Book of abstracts

cirad

IRD
Institut de Recherche pour le Développement
FRANCE

ISRA

**interdrought7.org**

SESSION 3 - Increasing water use efficiency (crop focus)

**Three-way Hybrids: A novel way towards improving pearl millet productivity in drought-prone environments of
north-western India**

Gupta S K (s.gupta@cgiar.org), Kandarkar Kuldeep, Patil Sudarshan

*Pearl millet Breeding, Research program- Accelerated Crop Improvement, ICRISAT, Hyderabad, Telangana, India*

**Rationale:**
The productivity of pearl millet is very low (600-700 kg/ha) in about 3.5 m ha drought-prone environments of western India having rainfall of <400mm per annum. The cultivar choice is limited to farmers in this region. This investigation targeted to evaluate the potential of three-way hybrids (TWH) for adaptation to drought and disease- prone environments of this zone.

**Methods:**
About 300 TWHs developed using sterile SCHs (A1x B2) of A1 CMS in diverse genetic backgrounds crossed with a diverse set of A1 restorers (R) were evaluated along with standard checks for grain yield in 3 to 4 environments under drought-prone ecology of north-western India during rainy seasons of 2020 and 2021, and seed production potential of the female parent was also investigated.

**Results:**
TWHs were identified with a 30-50% grain yield advantage over popular check SCH (HHB 67 Improved) with days to bloom in the desirable range of 45-48 days. Some of the hybrids with higher levels of disease tolerance (Downeymildew and Blast) and higher grain Fe and Zn content were identified. Sterile hybrid (female parent of TWHs) reported about 60 to 70% higher seed production over inbred seed parent.

**Conclusions & Perspectives:**
Careful selection of three parental lines can help to develop productive three-way hybrids having higher buffering capacity for adaptation to drought, which will improve the food and nutritional security of communities in the dryzone. Moreover, the lower seed production cost of three-way hybrids will help both the seed industry and farmers.