



ICRISAT

Crop Improvement



Background

ICRISAT, a global leader in dryland agri-food systems, is renowned for its innovative crop improvement program that addresses hunger, poverty, malnutrition, environmental degradation, and climate change issues. To improve crop resilience, nutrition, and sustainability, ICRISAT focuses on developing legumes, cereals, and oilseed crops essential to dryland food security.





Featuring cutting-edge technologies, ICRISAT's breeding program utilizes the Rapid-Gen Advancement Facility, which reduces the cost and time required for developing new varieties, as well as state-of-the-art phenotyping facilities such as the Automatic Rainout Shelter, LeasyScan, LysiField alongside integrated genomics-assisted breeding for pest and disease resistance as linked components of the breeding pipeline.

ICRISAT's improved crops and germplasm are widely shared with partners globally, with over 1,230 varieties released in 81 countries by the beginning of 2023.

Focus Crops:

-  Chickpea
-  Pigeonpea
-  Groundnut
-  Sorghum
-  Pearl millet
-  Finger millet
-  Small millets

Additional Crops:

-  Sunflower
-  Sesame
-  Mustard
-  Rapeseed
-  Soybean



ICRISAT's Crop Innovations

Sorghum:

- The forage sorghum hybrid CSH 24 MF developed using ICRISAT breeding material named as 'a landmark forage hybrid' in India.
- The high iron and zinc variety 'Parbhani Shakti' released in India and in trials for release in South Sudan.
- The world's first high-iron varieties, 'SAMSORG 45' and 'SAMSORG 46' were released in Africa.
- The first ethanol from sweet sorghum was produced from ICRISAT-bred cultivars - ICSV 25308 and RVICH 28.

Pearl Millet:

- 'Nafagnon' is the first commercial single cross hybrid released in Burkina Faso.
- 'Chakti', a high iron and zinc pearl millet, was released in Niger.
- The first iron biofortified variety, 'Dhanashakti' was released in India.
- HHB 67-Improved, a hybrid improved through marker-assisted selection for downy mildew resistance, was released in India.

Finger Millet:

- A high iron variety 'NAROMIL 3' was released in Uganda.
- Two high protein varieties NAROMIL 5 and EUFM-401 were released in Uganda and Kenya, respectively.
- An easy-harvest variety EUF 05, also known as 'snapping finger millet' was released in Kenya.
- Three high-yielding finger millet varieties, ACC 14FMB/01WK, KNE 688 and P224 were released in Malawi.

Chickpea:

- Machine-harvestable chickpea NBeG 47 was developed to reduce farm drudgery.
- The heat tolerant and high yielding improved variety, ICCV 92944 was released in India (JG 14), Myanmar (Yazin 6), Kenya (Chania Desi 2) and Bangladesh (BARI Chola-10).
- KAK2, the first large-seeded Kabuli variety was released in India.

Groundnut:

- ICRISAT contributed to the development of improved groundnut varieties, including 33 resistant to foliar fungal diseases, 4 resistant to groundnut rosette disease, 20 drought-tolerant varieties, 3 confectionery varieties, and 5 earlymaturing varieties.
- The first high oleic acid varieties 'Girnar 4' and 'Girnar 5' were released in India.
- The first Spanish type high oleic acid variety, GG 40 (ICGV 16668) was released in India.
- Two high oil yielding varieties, GJG 32 (ICGV 03043) and Chhattisgarh mungfali-1 (ICGV 06420) were released in India.

Pigeonpea:

Development of world's first pigeonpea varieties:

- The world's first commercial cytoplasmic male sterility hybrid ICPH 2671
- The world's first wilt and Sterility mosaic disease resistant variety 'Asha' (ICPL 87119)
- The world's first genetic male sterility hybrid ICPH 8
- The world's first Fusarium wilt-resistant variety 'Maruti' (ICP 8863)
- The world's first short duration variety ICPL 87091 released in Kenya and subsequently to other countries in ESA.

