



# An ICRISAT Success Story



## ICRISAT-Private Sector Partnership in Hybrid Parents Research

### Hybrid Parents Research Consortia

Recent years have witnessed remarkable growth in private sector investment in crop improvement, research and development, especially in crops that provide hybrid cultivar options. The sorghum and pearl millet hybrid seed industry has a well-established base in India and has derived immense economic benefits from hybrid parents research at ICRISAT. Pigeonpea hybrids are also now becoming a commercially viable proposition.

Based on the track record of on-farm impact, several private seed companies came forward in 2000 to provide partial funding support to sorghum and pearl millet hybrid parents research. A similar consortium has been formed for hybrid parents research in pigeonpea in 2003. The guidelines for the consortia were revised in 2004.

### Impact

#### Sorghum

- Half of India's 10 million ha under sorghum is planted with hybrids. Of the 50 hybrids in use, about 30 (mostly from the private sector) are based on ICRISAT-bred parental lines, or on proprietary parental lines developed from ICRISAT-bred improved germplasm.



*A private sector sorghum breeder chooses among male-sterile lines at ICRISAT for use in his program.*

- The partnership research deals with:
  - ◆ Development of seed parents with large seed size and shoot fly resistance
  - ◆ Development of dual restorers of  $A_1$  and  $A_2$  cytoplasmic-nuclear male sterility (CMS) systems
  - ◆ CMS characterization
- Sixteen seed companies in the consortium in 2004.

#### Pearl millet

- Nearly 60% of India's 10 million ha under pearl millet is planted with at least 70 hybrids, of which 60 or more (mostly from the private sector) are based on ICRISAT-bred parental lines, or on proprietary parental lines developed from ICRISAT-bred improved germplasm.
- The partnership covers the entire core research agenda on hybrid parents research at ICRISAT and includes:
  - ◆ Targeted evaluation and utilization of germplasm for yield components, quality and adaptation traits
  - ◆ Development of trait-specific breeding lines with high yield and downy mildew resistance



*Seed production of a popular private sector pearl millet hybrid.*

- ◆ Development of seed parents in diverse cytoplasmic backgrounds
- ◆ Development of restorers of diverse CMS systems
- ◆ CMS characterization
- Twenty-four seed companies in pearl millet consortium in 2004.

## Pigeonpea

- ICRISAT has been a leader in pigeonpea hybrid parents research. One significant achievement was the development and release of ICPH 8 – the first pigeonpea hybrid developed anywhere in the world. Due to high costs involved in seed production of hybrids based on genetic male sterility, ICPH 8 did not become commercial, but it showed the potential of a hybrid cultivar, and led the way for identification of the first ever CMS system using cytoplasm from its wild relative *Cajanus sericeus*.
- The partnership research with Maharashtra Hybrid Seed Company (MAHYCO) began in 1998 and included:
  - ◆ Development of GMS-based, high-yielding and disease resistant hybrids
  - ◆ Development of hybrid seed production technology
  - ◆ Training for transfer of hybrid technology and human resource development
  - ◆ Identification of alternative CMS systems and their stable restorers
- Seven seed companies are members of the pigeonpea consortium.

## Revised consortium arrangements

Based on joint discussions between the private sector and ICRISAT, the guidelines for the Hybrid Parents Research Consortia have been revised effective Jan 2004. The current Consortia members will continue as 'primary' members. New seed companies can join the consortia as



*ICPH 2001 – a short-duration CMS-based pigeonpea hybrid.*

'primary' or 'promotional' members, depending on the need for different breeding materials and/or hybrid parents.

## Donors and partners (up to Dec 2004)

### Sorghum, Pearl Millet and Pigeonpea

- Ankur Seeds
- Emergent Genetics India
- J K Agri Genetics

### Sorghum and pearl millet

- Ajeet Seeds
- Bioseed Research India
- Ganga Kaveri Seeds
- Kaveri Seed Co.
- Kanchan Ganga Seed Co.
- Mahodaya Hybrid Seeds
- Nuziveedu Seeds
- Proagro Seed Co.
- Tulasi Seeds

### Sorghum and Pigeonpea

- Basant Agrotech

### Pearl Millet and Pigeonpea

- SM Sehgal Foundation
- Zuari Seeds
- MAHYCO

### Pearl millet

- Armour Hybrid Seeds
- Green Gold Seeds
- Metahelix Life Sciences
- Nature Great Seed Int.
- Navbharat Seeds
- Pioneer Overseas Corpn.
- Rasi Seeds
- Syngenta India
- Vibha Agritech

### Sorghum

- Misr Hytech Intl.
- P.T. Benihinti Int.
- Vikki's Agrotech

### ICAR's All India Coordinated Projects on

- Sorghum
- Pearl Millet
- Pigeonpea

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