



An ICRISAT-Private Sector Success Story



A New Large Grain Sorghum Hybrid: JKSH 22

The problem

Before 1990, several breeding programs – in both private and public sectors in India – extensively used a single female parent (296B) in their hybrid development programs. The seed parent, 296A is highly sensitive to low temperature leading to difficulties in hybrid seed production. This led to increased hybrid seed costs. Since only one female parent was extensively used, it also led to reduced diversity of hybrids grown by farmers in India.

Getting started

ICRISAT's policy of developing value-added parental lines helped capture the synergies of the partnerships between ICRISAT and private sector seed companies wherein the partners, depending on their skills and resources, develop the hybrids for commercial use. Trait-based breeding approach followed by the sorghum breeders at ICRISAT helped to focus on breeding for large-grained high yielding temperature-insensitive parents.

The process at ICRISAT

ICRISAT started a program on diversifying sorghum female parents in early 1980s. A range of large-seeded and high yielding male-sterile lines were developed that set seed even under lower temperatures. ICRISAT genebank

provided landrace germplasm needed for the breeding program.

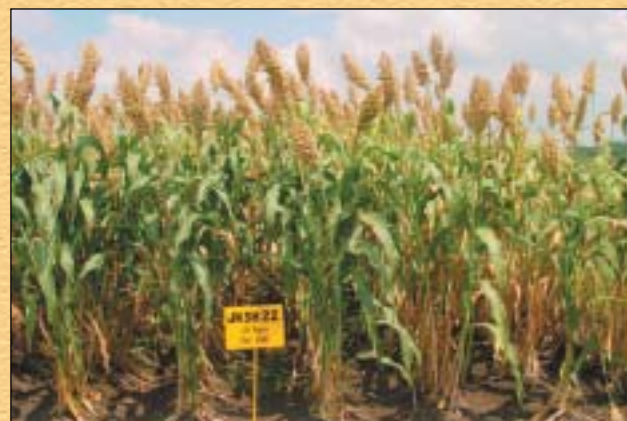
Large-seeded landraces were used in crosses with high yielding commercial varieties/B-lines to create diversity. The selections were test crossed on to existing male-sterile lines to find out their male-sterility maintainer reaction and those that maintained male sterility were converted into female parents. These were yield tested and the promising seed parents were supplied to the breeders in private and public sectors. Similarly, male parents that restore fertility in hybrids were developed and supplied to the breeders in India and others on specific requests.

The process at JK Agri Genetics

The base parental lines received from ICRISAT in early 1990s were further modified, selected and multiplied. Several hybrids made from the modified ICRISAT-supplied hybrid parental lines were field tested in multi location trials. Also, several on-farm demonstration trials were conducted involving the selected hybrids. Based on the performance and feedback of the farmers, JKSH 22 (JKSH 161) was finally selected for large-scale production in 1994 and marketing in 1995. It was also tested in the All India Coordinated Sorghum Improvement Project and was released for all agro-climatic zones in India in 1999.



JKSH 22 on a farmer's field: the taller, white, early-maturing rows are male, and the shorter, green and late-maturing rows are female.



JKSH 22 is popular with farmers for cultivation in the rainy season.

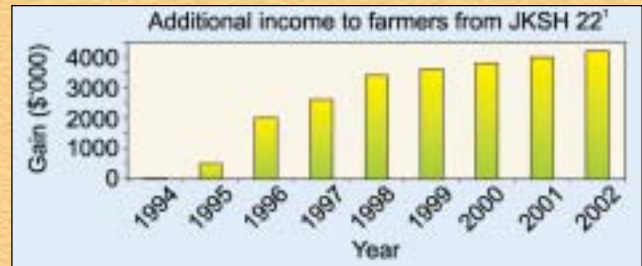
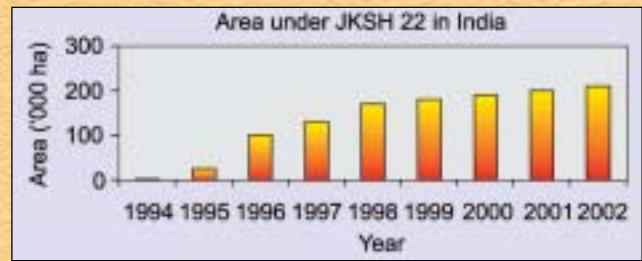
JKSH 22 hybrid characteristics

- A grain sorghum hybrid for the rainy season
- Produces a grain yield of 3.8 to 5.7 t ha⁻¹
- Has broad, semi-erect leaves with dull green midrib
- Has cylindrical well-exserted panicle
- Has cream colored, large lustrous grains (3.6 g 100⁻¹)
- Flowers in 65-72 days and matures in 100-105 days
- Grows to a height of 2.0-2.3 m during the rainy season
- Is quite popular with farmers in sorghum growing areas for cultivation in the rainy season

Impact from JKSH 22 hybrid seed production

Seed production has been taken up on a large scale in Kurnool district, Andhra Pradesh, India, since 1994. Farmers, on an average, produced about 3.0 t ha⁻¹ hybrid seed to obtain a profit of about Rs 29500 (\$630). Between 1994–2002 seed production earned farmers, on an average, \$306000 per annum.

Impact from JKSH 22 cultivation



¹Incomes are compared with those from existing varieties/hybrids at 200 kg ha⁻¹ superiority in grain yield; Additional incomes are calculated @1 kg grain = \$0.1.

Based on seed sales of JKSH 22, farmers in Maharashtra and other sorghum growing areas in India have earned an average of \$2.68 million every year for the last nine years from cultivating JKSH 22.

Partners

- JK Agri-Genetics
- Indian Council of Agricultural Research (ICAR)

Donors

- ICRISAT core donors
- JK Agri-Genetics

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