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## Developing hybrid wheat for yield enhancement under Indian conditions

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Globally heterosis breeding has resulted in enhancing productivity in many crops, especially the cross-pollinated crops. Attempts to exploit heterosis in wheat, a self-pollinated crop, began in 1950s with introduction of cytoplasmic male sterility (CMS) using *Aegilops caudate* cytoplasm. However, the CMS source derived from *Triticum timopheevii* led to the initiation of a systematic hybrid development programme in wheat. Besides the three-line breeding approach using CMS system, two-line approach using chemical hybridising agent (CHA) and environmental male sterility was also advocated. As only small gains in yield are obtained from conventionally bred cultivars, the hybrid wheat development programme was initiated in India under coordinated research programme of the ICAR in 1995 through CMS and CHA systems. Experimental hybrids showing sufficient standard heterosis were developed, but their commercial exploitation had many bottlenecks. The limited number of fertility restoration sources, unstable behaviour of the restorer and CMS lines under different environments and cultural conditions are major constraints which are being addressed for achieving success in hybrid wheat development programme in India. Furthermore, the heterosis observed in the experimental hybrids has not been in consonance with the cost of seed production. Although, the private sector company MAHYCO released two wheat hybrids (Pratham 7070 and Pratham 7272) in 2002 for low input conditions of central and peninsular India, they did not become popular as their yield could not surpass the commercial pureline cultivars. The development of hybrid wheat for highly favourable environments in the wheat bowl region of North-West India is being presently focussed as vast scope for yield enhancement is possible in this area. Initial successes have been achieved and experimentation under large plots is underway.

### Biography

Sanjay Singh has completed his Ph.D. in 1999 from Banaras Hindu University, Varanasi, India and thereafter associated in wheat research and coordination as wheat breeder at the Directorate of Wheat Research, Karnal, the nodal centre for wheat & barley research in India. He released 09 wheat varieties and registered 11 wheat genetic stocks for various traits. He published 173 research papers/ abstracts/chapters, etc. pertaining to wheat crop in particular in journals of national / international repute. He is a recipient of several awards including Lal Bahadur Shastri Young Scientist Award (ICAR) in 2007 & Young Scientist Award of the Council of Science and Technology, UP in 2008.

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