

IRRI develops first-of-its-kind speed breeding protocol for indica and japonica rice

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Scientists from the International Rice Research Institute (IRRI) successfully developed a robust, first-of-its-kind speed breeding protocol that reduces the generation times required in a year for growing *indica* and *japonica* rice.

The current rate of genetic gain attained in rice crops through breeding is inadequate to meet the increasing future rice demand of a growing population. The development of new varieties is further hindered by longer generation times and seasonal constraints.

Through the SpeedFlower protocol, these factors will no longer impact the acceleration of varietal development, by reducing generation times by almost half which allows growing four to five generations of *indica* and *japonica* rice in a year.

“We can now develop new high-yielding, climate-resilient, and nutritionally superior rice varieties in a much shorter duration. This is a major scientific step toward significantly boosting genetic gain in rice, ultimately contributing to global food security,” said program lead Drs Vikas Kumar Singh, Uma Maheshwar Singh and Pallavi Sinha.

The Speed Breeding technique

The Speed Breeding (SB) technique has been introduced to effectively manage environmental factors and is suitable for short- and long-day crops, allowing it to be utilized throughout the year. As a result, SB has gained popularity as a method for advancing multiple generations per year.

Using SB in glasshouses and controlled chambers has the potential to enhance breeding outputs for both short- and long-day crops. This is achieved by providing more controlled growth conditions, which work more uniformly for diverse germplasm and breeding materials compared to field conditions.

The success of SB in various crops has led to the establishment of a [state-of-the-art SpeedBreed facility at the ISARC](#) in Varanasi, India. To achieve SB in rice, the facility has been customized with controlled growth parameters using fully enclosed walk-in growth chambers designed to optimize the SB protocol for all types of rice varieties without the need for tedious embryo rescue techniques and tiller removal.