

Secret to on-off fertility discovered in pigeonpea

RESearchers from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), University of Vienna and UWA have identified how temperature controls male fertility in some lines of pigeonpea, and have unraveled the phenomenon's molecular mechanism in a recently published study in *The Plant Genome*.

They have also shown that sterility can be reversed with auxin treatment. The new findings are expected to pave the way for techniques that can reduce the cost and effort in hybridising the crop, and lead to increased yields.

Pigeonpea is extensively grown and consumed in South Asia and Eastern Africa, being one of the oldest food crops and a staple source of protein.

Through their research, the authors demonstrated that pigeonpea lines turning fertile in response to the environment, called Environmentsensitive Genic Male Sterility (EGMS) lines, can go from being male sterile to male fertile if the temperature of the growing environment is reduced to 24°C.

Dr Rajeev Varshney, Director for the Genetic Gains Research Program at ICRISAT and UWA Adjunct Professor with IOA, led the study and said that the research is a result of what scientists today call Systems Biology – a combinatorial approach of transcriptomics, proteomics, metabolomics and computational genomics.

"Together with cytological analysis and multiomics analyses,

we have explained the molecular mechanisms underlying fertility transition," Rajeev said.

"The findings of this study enable the development of an effective two-line hybrid breeding system for rapid, inexpensive and high-quality hybrid pigeonpea seed production."

This article was adapted from ICRISAT Happenings Newsletter
Adjunct Professor Rajeev Varshney, E: R.K.Varshney@cgiar.org



Rajeev Varshney in a pigeonpea field at ICRISAT.



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