**Pathogen fitness, disease dynamics and host plant resistance under the changing climate scenario with special reference to legumes (chickpea and pigeonpea)**

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The significance of grain legumes like chickpea and pigeonpea in ensuring food and nutritional security, particularly in the context of climate change is critical. Globally, 30-40% of crop produce is lost to pests and diseases annually, with overall losses in yield far greater in Asia and Africa.

ICRISAT in collaboration with National Agricultural Research Systems (NARS), has been instrumental in developing high-yielding, disease-resistant varieties of these crops. These efforts are crucial as they address the substantial yield losses caused by pests and diseases, which are exacerbated by climate change.

Innovative approaches, including the use of artificial intelligence for early disease detection and risk mapping, are being employed to combat these challenges. The evaluation of 5000 chickpea germplasm accessions for resistance to diseases like Fusarium wilt, Ascochyta blight, Botrytis gray mold, dry root rot is a testament to the proactive measures being taken to address the increasing burden of crop losses. Similarly, advancements in pigeonpea breeding for resistance to diseases such as wilt, sterility mosaic disease and Phytophthora blight showcase the dynamic nature of agricultural research in response to evolving threats.

The use of novel sources of resistance and advanced breeding methods will not only enhance yield stability but also contribute significantly to sustainable food production. This aligns with global research indicating that a major refocusing towards grain legumes is required for food security and climate resilience. Additionally, the impact of climate change on legume physiology and ecosystem dynamics further emphasizes the need for such innovative approaches.

***References:***

*Sharma M, Avijit Tarafdar, Abhay Pandey, S. Ahmed, Vibha Pandey, Devashish R. Chobe et al. 2021. Biotic Stresses in Food Legumes: An Update and Future Prospects Pages 149-196 In Genetic Enhancement in Major Food Legumes - Advances in Major Food Legumes.*

*Delgado-Baquerizo, M., Guerra, C.A., Cano-Díaz, C. et al. The proportion of soil-borne pathogens increases with warming at the global scale. Nat. Clim. Chang. 10, 550–554 2020. https://doi.org/10.1038/s41558-020-0759-3*