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## Developing climate resilient wheat

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To meet the food security demands of growing human population, yield of majority of the crop plants needs to be doubled by 2050 while dealing with the climate change. With the increasing temperature trends and unusual climatic changes, crops in future climates will experience frequent temperature extremes causing significant yield losses. Heat stress is a serious challenge to wheat production as every 1 °C increase above the optimal temperature results in 4-5% yield loss. Rainfed areas of the US are projected to decrease wheat production by 20-40% due to climate change. Thus, developing climate resilient wheat is crucial in today's context. As a public-private partnership, Feed the Future Innovation lab-Climate Resilient Wheat is developing heat tolerant varieties by exploiting natural variation. A short period of heat stress during germination had serious and long-term effect on plant development and yield. A ten-day heat stress at germination reduced germination percentage, coleoptile length and yield. Sugars availability maybe a reason for the effect on germination as external application of sucrose showed significant recovery in germination percentage and coleoptile length. Heat stress during vegetative phase significantly affected tiller number, flowering time, pollen fertility, plant height and yield. During the reproductive stage, heat stress adversely affected photosynthesis and increased membrane disintegration due to decreased chlorophyll index and increased ROS and lipid peroxidase activity. The identified heat tolerant lines will be used to transfer the trait into wheat cultivars by simultaneous detection and utilization of QTLs. Various molecular and physiological studies for the trait are underway and update will be presented.

### Biography

Kulvinder S Gill has completed his PhD from Kansas State University followed by Postdoctoral studies at the same university for about 3 years. He is the Professor and Director of the Feed the Future Innovation Lab: Climate Resilient Wheat. He has published more than 100 papers in reputed journals. His research program focuses on understanding and utilizing chromosome pairing control in polyploids, developing alternate dwarfing gene systems for wheat and on using modern tools and technologies for crop improvement.

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