Researcher developing wheat that does not sprout when exposed to wet harvest conditions

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Visiting scientist Dae Wook Kim from the National Institute of Crop Science in

Visiting scientist Dae Wook Kim hopes to develop a line of Korean wheat that does not sprout when exposed to wet harvest conditions, thanks to genetic screening techniques he learned at South Dakota State University.

He is working with molecular biologist Jai Rohila of the biology and microbiology department through a two-year project sponsored by the National Institute of Crop Science in Suwaon, South Korea. It is part of his country's effort to increase wheat production.

Rohila will present this research at the McFadden Symposium Wed., Sept. 24, at 11 a.m. in the Performing Arts Center on the SDSU campus.

Korean farmers raise white winter wheat, planting in October and harvesting in June;however, the country's rainy season begins in June, explained Kim. If the rains hit before the crop has been harvested, the grain begins to sprout in the head.

Korean white winter wheat is particularly susceptible to preharvest sprouting, according to Kim. Preharvest sprouting reduces the quality of the grain and the yield, added Rohila.

Last summer, SDSU spring wheat breeder Karl Glover provided Kim with 40 lines of South Dakota wheat—half tolerant and half susceptible to preharvest sprouting. Kim compared these lines to determine which genes and proteins account for tolerance.

When Kim returned in July for his second three-month stay, he brought seeds from two Korean lines—Sukang, which has more sprouting

tolerance, and Baegjoong, which is susceptible.

Looking at both lines, he identified 33 proteins that are differentially expressed in the tolerant cultivar. Kim will quantify the gene expression levels from Glover's newest lines that are resistant to preharvest sprouting and compare those results with the list of differentially expressed proteins from the Korean cultivars.

If the same proteins are differentially expressed in Glover's varieties, Kim will validate the genes he identified as important to tolerance in his Korean varieties.

"If it is related to tolerance, the same gene should be in other tolerant varieties." Kim added. "At that level, we know the gene is expressed in the same way."

His work at SDSU will decrease the time it takes to improve preharvest sprouting tolerance in Korean white wheat.

Provided by South Dakota State University

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