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## Development of Wheat Breeding Material Mediated wide Hybridization Response to Climate Change

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### [Abstract]

This study is to develop new wheat breeding material through wide hybridization with wild species harboring useful characteristics such as salt, heat, and drought tolerance. *Leymus mollis*, wild rye was used to improve wheat genetic quality. *L. mollis*, is a perennial plant harboring tolerance against salt, heat, and drought because *L. mollis* distributes on the seaside. The F<sub>1</sub> hybrids were produced by crossing between common wheat (*Triticum aestivum* L., Chinese Spring) and *L. mollis*. Genomic in situ hybridization revealed that the F<sub>1</sub> hybrids have *L. mollis* genome. For the evaluation of salt and drought tolerance, seeds from the F<sub>2</sub> were used. Under 2% NaCl solution, the F<sub>3</sub> wheat-*Leymus* addition plants with salt tolerance showed more tillering and longer roots than other F<sub>3</sub> plants without salt tolerance. Also, the F<sub>3</sub> plants with salt tolerance showed better shallow-rooted than other F<sub>3</sub> plants without salt tolerance. Finally, the F<sub>3</sub> plants with salt tolerance made seed-setting under 2% NaCl condition, but other F<sub>3</sub> plants without salt tolerance were not. Under drought conditions, the F<sub>3</sub> plants with drought tolerance showed longer culm and spike length than other F<sub>3</sub> plants without drought tolerance and even those of Chinese Spring under well-water conditions. We evaluated and selected the F<sub>3</sub> plants with salt or drought tolerance for generation advancement.

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