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## Improvement of Wheat *Agrobacterium*-mediated Transformation using ‘Speed Breeding’ and *GRF-GIF* Chimera Gene

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### [Introduction]

The *Agrobacterium*-mediated transformation method is a method frequently used because of the high frequency of integration of a transgene into the host genome of a plant as a single copy event. However, there are still obstacles such as embryogenesis probability and inoculation conditions in achieving the transformation of Korean wheat using *Agrobacterium* in Korea, and even research using particle bombardment has also low probability. Therefore, research to improve the efficiency of *Agrobacterium*-mediated transformation of wheat varieties is essential. In a previous study, we reported the successful feasibility of an immature embryogenetic culture method with ‘Speed Breeding’ applied in Korea.

### [Materials and Methods]

The wheat transformation was applied to immature embryos collected by growing ordinary wheat under ‘Speed breeding’ conditions. The efficiency of wheat transformation was confirmed by measuring the transgene integration rate through PCR analysis. In addition, the recently reported *GRF-GIF* chimera gene was cloned from cv. Keumgang, the most produced variety in Korea, and the ability to improve regenerative capacity and shorten the tissue culture period was confirmed.

### [Results and Discussion]

The transgene integration was confirmed by PCR screening of selected and one regenerated callus for 5 weeks with G418 antibiotic. As a result of the immunostrip test using the putative transformant, the stably transgene integration efficiency was 0.15%. In addition, it was confirmed that regeneration in the calli was achieved even when the wheat tissue culture period was shortened to 3 weeks. Finally, PCR screening using a putative transgenic plant confirmed that it was an integrated transgene. This study can be useful information for the development of wheat transformation system in Korea.

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