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Improvement of agrobacterium-mediated T-DNA transfer in soybean (glycine max)

Since the 1930s soybean has become the most widely grown protein/oilseed crop in the world, with the United States now producing 55% of the world's soybean. Due to many uses of soybean, researchers aim to discover functions of soybean genes and improve soybean traits employing transgene technology. One of the most efficient transgene technologies is the Agrobacterium-mediated T-DNA transformation. The purpose of this project is to test the various factors that could improve T-DNA transfer in soybean and help control contamination in order to enhance productivity of soybeans. We have evaluated the effect of expression of Vir G protein, and pre-incubation before inoculation on T-DNA transfer efficiency. We also tested the impact of PPM (a plant preservative) on eliminating culture contaminations. The soybean transformation protocol (Zeng et al., 2004, Plant Cell Rep 22:478-482) was followed with varying conditions as listed above. Histochemical GUS staining was conducted at the end of shoot induction period to compare T-DNA transfer efficiency among the treatments. To test the impact of PPM, contaminated explants were cultured on the medium amended with varying levels of PPM. So far, our data shows that constitutive expression of Vir G protein reduced but not enhanced T-DNA transfer in soybean. PPM at a high concentration effectively eliminates contaminations. However, it will take longer culture period to conclude whether pre-incubation and PPM truly improve T-DNA transfer and transgenic soybean recovery, respectively. Results will be presented.

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