

# Lack of Glyphosate Resistance Gene Transfer from Roundup Ready® Soybean to *Bradyrhizobium japonicum* under Field and Laboratory Conditions

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A field study was conducted at the Russell E. Larson Agricultural Research Center to determine the effect of transgenic glyphosate-resistant soybean in combination with herbicide (Roundup) application on its endosymbiont *Bradyrhizobium japonicum*. DNA of bacteroids from isolated nodules was analysed for the presence of the transgenic 5-enolpyruvylshikimate-3-phosphate synthase (CP4-EPSPS) DNA sequence using polymerase chain reaction (PCR). To further assess the likelihood that the EPSPS gene may be transferred from the Roundup Ready® (RR) soybean to *B. japonicum*, we have examined the natural transformation efficiency of *B. japonicum* strain 110spc4. Analyses of nodules showed the presence of the transgenic EPSPS DNA sequence. In bacteroids that were isolated from nodules of transgenic soybean plants and then cultivated in the presence of glyphosate this sequence could not be detected. This indicates that no stable horizontal gene transfer (HGT) of the EPSPS gene had occurred under field conditions. Under laboratory conditions, no natural transformation was detected in *B. japonicum* strain 110spc4 in the presence of various amounts of recombinant plasmid DNA. Our results indicate that no natural competence state exists in *B. japonicum* 110spc4. Results from field and laboratory studies indicate the lack of functional transfer of the CP4-EPSPS gene from glyphosate-tolerant soybean treated with glyphosate to root-associated *B. japonicum*.

**Key words:** *Bradyrhizobium japonicum*, Glyphosate, Horizontal Gene Transfer