

PA-118

Identification of Root Morphological Traits in Soybean (*Glycine max* L.) inoculated with Bacterial Wildfire, at Early Growth Stage

Liny Lay¹, Pooja Tripathi¹, Yoonha Kim^{1*}

¹School of Applied Biosciences, Kyungpook National University, Daegu, 41566 South Korea

[Introduction]

The objective of this research was to identify the effects of bacterial wildfire in root morphological traits between control and inoculated plants in Cheongja and Daechan soybean cultivars.

[Materials and methods]

Plants were grown under optimal growth conditions in a greenhouse. Single plant was grown in each polyvinyl chloride (PVC) pipes [16.5cm (diameter) × 50cm (height)]. The inoculation was done when the soybean plants reached to the V2 growth stage by spraying bacterial culture on the leaves. Then, the plants were covered with plastic bags for 24 hours. Root samples were collected 10 days after the inoculation. The roots were carefully washed to remove adhering soil particles and stored in a plastic bag containing water. Two-dimensional (2D) images of roots were obtained by an EPSON scanner. The image was then analyzed by WinRHIZO Pro software (WinRHIZO, Regent Instruments Inc., Canada). Total six root phenotypes such as total root length (TRL), surface area (SA), average diameter (AD), root volume (RV), tip number (TN) and fork number (FN) were investigated.

[Results and discussion]

According to the ANOVA result, all of the root morphological traits were found to be significantly different between treatments. Whereas, variety X treatment interaction was found to be significantly difference only for AD. The visible symptoms of disease on the leaves of Cheongja variety (1.81%) was higher than Daechan variety (0.06%). Cheongja and Daechan showed 43% and 27% lower TRL in inoculated plants as compare to control plants respectively. Similarly, Cheongja and Daechan showed highly significant difference between the two treatments. SA of the inoculated plants was found to be 27% lower as compared to control plants. Similar pattern was observed in FN as well. Cheongja variety showed significantly higher AD (48%) in control as compared to inoculated plants. Even though Daechan showed non-significant difference between the treatments, AD in inoculated plants were 17% lower the control plants. Daechan showed significantly higher RV (28%) in control as compared to inoculated plants whereas the difference between treatments were non-significant in Cheongja. Both of varieties demonstrated a non-significant difference between the treatments for TN. In conclusion, soybean varieties showed decreased root morphological traits such as TRL, SA, AD, RV and FN in bacterial inoculation.

[Acknowledgement]

This work was carried out with the support of “Cooperative Research Program for Agriculture Science and Technology Development (Project No: PJ01567802)” Rural Development Administration, Republic of Korea.

*Corresponding author: Email: kyh1229@knu.ac.kr Tel. 053-950-5710.