

Change in Yield and Quality Characteristics of Rice by Drought Stress Treatment during the Seedling Stage

Sumin Jo^{1*}, Jun-Hyeon Cho¹, Ji-Yoon Lee¹, Young-Ho Kwon¹, Ju-Won Kong¹, Tae-Heon Kim¹, Sais-Beul Lee¹, Jong-Hee Lee¹, Dong-Soo Park¹, You-Chun Song¹, Jong-Min Ko¹

¹National Institute of Crop Science, Miryang 50424, Republic of Korea

[Introduction]

Drought caused by global climate change is one of serious problems for rice cultivation. However, it was little reported the impact of drought on rice cultivation in Korea. The increase in the frequency of occurrence of abnormal weather could include severe drought, which could cause rice water stress during the seedling stage. This experiment was conducted to clarify the effects of drought during the seedling period on yield and quality of rice.

[Materials and Methods]

The drought treatment was conducted for 25 days at 3, 10 and 20 days after transplanting. Drought conditions were created by rain shelter house facility, Soil water content was measured by soil moisture sensor during whole growth stage. In this study, we have chosen 3 rice cultivars including ‘Haedamssal’ (Early maturing one), ‘Samkwang’ (Medium maturing one) and ‘Saenuri’ (Mid-late maturing one) which are widely cultivated in Korea.

[Results and Discussions]

Yield and grain quality decrease was more severe drought treatment at 3 days after transplanting because of the decrease in the number of effective tiller and because of the increase protein content and hardness. In the cultivars, ‘Haedamssal’ (Early maturing one) was more severe damaged by water stress about 40% yield loss than mid-maturing japonica, Samkwang and Saenuri. Days to heading of early maturing cultivars was short, which lost early vigorous growth chance in drought condition. As a result, drought stress affects the number of tillers after transplanting immediately, which is a decisive factor in reducing yield. This study can be used as a basic data to calculate damage compensation for drought damage in actual farmhouse.

[Acknowledgements]

This work was carried out with the support of “Cooperative Research Program for Agriculture Science and Technology Development (Project title: QTL mapping for development of functional rice with disease and drought resistant, Project No. PJ01112703)”, Rural Development Administration, Republic of Korea.

*Corresponding author: Tel. +82-55-350-1175, E-mail. tnals88319@korea.kr