[P4] Crop Genetics and Physiology

2021年9月9日(木) 12:15 ～ 14:00 Room 4 (Poster) (Crop Genetics and Physiology)

12:15 ～ 13:00

[P4-29]Effect of Silicon Application on Grains of *Sorghum bicolor* under Drought Conditions

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The positive effects of silicon on plant growth are well known. To date, it has been reported that stress conditions such as drought enhanced the effect of silicon treatment in various plant species. In this study, we investigated the mineral contents in sorghum under drought stress conditions with or without silicon to reveal the effects of silicon application on sorghum (Sorghum bicolor cv. K8) grains. Silicon treatment changed the mineral contents of the grains under drought stress conditions. Especially, the application of silicon to sorghum grown under drought stress significantly increased iron content in the grain, although plant biomass was decreased. On the other hand, the silicon application did not considerably affect the plant biomass under our experimental conditions. These results suggested that silicon application enhanced iron accumulation in grains under drought stress conditions, although the plant biomass was not affected. To further elucidate the accumulation of iron in grains, RNA-seq analysis was performed on sorghum leaves grown in pots. RNA-seq analysis showed that about 2,500 genes were significantly up-regulated by drought stress, and about 1,000 genes were significantly up-regulated by silicon treatment under drought conditions. In contrast, less than 100 genes were up-regulated in the non-drought treatment. These expression patterns indicated that the silicon treatment had a significant effect on gene expression under drought stress conditions.