콩에서 가뭄 정도에 따른 표현형 관찰

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Identification of Phenotype Index under Drought Stress in Soybean

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Droughts would occur frequently under climate change conditions. The response of crops to drought would differ by the condition of soil water deficit, which makes it challenging to characterize the outcome of drought. Non-destructive approaches have been used to monitor the phenological changes of a crop under a given condition, e.g., limited water supply. The objectives of this study were to examine the phenotypic response of soybean to drought using various approaches, including thermal image system. In total, 28 soybean varieties were grown under a set of irrigation scheduling in a greenhouse. For the treatment for drought, water supply was terminated at the time period of V5-V6 stage for two weeks. The soil volumetric water content was monitored using the EasyAG Probe (Campbell Scientific Inc., USA). The FLIR SC620, which is a thermal imaging system (FLIR System, USA) was used to measure leaf temperature at three day interval during the drought period. The SPAD values were obtained to measure photosynthesis and chlorophyll contents. The irrigation was resumed to monitor the recovery response of crop using the same system after the extended period of the drought stress. The yield components including total seed weight per plant were measured to identify the phenotypic traits associated with yield under the drought conditions. The time series data for the phenotypic traits would be useful for identifying the genetic resources to mitigate the impact of drought on soybean production. This would also allow to design more effective strategy for developing drought-tolerant soybean varieties in breeding program.

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