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[O14] Legume Production in Asia

Chair: Kuniyuki Saito (Okayama University, Japan)

Chair: Tianfu Han (Chinese Academy of Agricultural Sciences, China)

2021年9月10日(金) 09:45 ~ 11:45 Room 1 (Oral) (Field Crop Production)

10:40 ~ 10:55

[O14-04] Response to High Temperature Environments in Production, Quality and Physiological Activity of Two Soybean varieties

*Nominated for Presentation Awards

○Taiyu Lin, Yuki Okamoto, Tatsuhiko Shiraiwa (Graduate School of Agriculture, Kyoto University, Japan)

High temperature (HT) or high night temperature (HNT) in warm region negatively impacts soybean production. For adaptation, we need to understand crop physiological responses and explore adaptive germplasms. We examined the responses to HT and HNT of 2 soybean varieties, a Japanese var. Fukuyutaka and a US var. DS25-1. The latter was the best stable performer at Indonesia among genotypes from temperate regions.

The two varieties were grown in a temperature gradient chamber (TGC) and a phytotron. The TGC created a temperature gradient from near-ambient to that plus up to 3°C all day long (HT) or only night (HNT) from the R1 to R7 stages. In the phytotron, only Fukuyutaka was treated with NT of 22 and 28°C, extreme HNT. Plant growth, seed appearance quality and physiological traits were assessed.

DS25-1 showed stable growth performance under both HT and HNT, while Fukuyutaka tended to reduce total biomass and yield in both the TGC and phytotron studies. The negative response of Fukuyutaka to HT and HNT was associated with tendencies of earlier senescence, Nfix and higher maintenance respiration. The stable performance of DS25-1 was attributed to the stable biomass production and the number of flowers under HT and HNT. DS25-1 also showed more stable seed appearance than Fukuyutaka. HNT as 28°C in the phytotron caused declines of Pn and earlier senescence, which were not evident in the TGC study with moderate HT and HNT. Decline of Pn also evident when HNT was given only R1-R5, suggesting that physiological activity is sensitive to HNT particularly in early reproductive period.