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Effects of high temperature on the flowering & pod setting and rain in the seed elongation stage on the soybean growth

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Abstract

Climate warming is the issue on the global scale. Soybean can be seriously damaged when high temperature occurs during a reproductive stage such as the flowering and pod-setting period according to the Representative Concentration Pathway (RCP) (2021~2100) 8.5 scenarios. The weather in 2016 was very different from other years (average for 30 years from 1980 to 2010) ; the highest temperature was 33.7°C which was higher 3.29°C than average temperature from last 30 years and average rainfall was 26.5 mm, lower 140.9 mm than average rainfalls from other years. Especially, the highest temperature during soybean flowering and pod setting stage was 26.8 °C which was higher 0.1 °C and rainfall was 172.2 mm, higher 47.8 mm than other years from the first to the 20th in the October at soybean seed elongation stage. Soybean leaves were turned upside down by the drought stress during the flowering and pod-setting stage. The number of pods and seeds per unit area decreased 11.0% and 30.3% compared with the previous year, respectively. The ripening period was prolonged by 21 days because of high temperature and soil moisture contents due to the continual rainmade increase of the seed weight up to 15.6% and the yield decreased 7.1% compared to the previous year.

Keywords: Soybean, RCP scenario, High temperature

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