

PA-142

Investigation of Changes in the Growth of Mid-Late Cultivars through the Comparison of Regional Weather Conditions in the Rice Yield Forecast Test

HyeonSeok Lee^{1*}, UnHa Hwang¹, SeoYeong Yang¹, MyoungGoo Choi¹, JeongHoe Jeong¹, YeongSeo Song¹, UJin Lim¹, ChungKuen Lee¹

¹Crop Production & Physiology Division, National Institute of Crop Science, Rural Development Administration, Wanju 55365, Republic of Korea.

[Introduction]

Owing to climate change, damage affecting rice production from abnormal weather, such as an increase in average temperature, temporary heat waves, and high concentration of surface ozone gas, is expected to increase. Although the average productivity of rice has recently increased compared to the early 2000s, the fluctuations in productivity due to abnormal weather are increasing. In order to respond to climate change, a yield forecast test is conducted every year to investigate growth and productivity fluctuations using rice varieties grown in 17 regions. In this test, changes in the weather conditions of 17 regions in the 2022 crop were investigated. In addition, the change of weather conditions for each growth stage of rice and its growth change were investigated. The growth analysis was conducted using mid-late rice varieties in two regions with increased growth (Naju, Daegu) and two regions with decreased growth (Andong, Yesan) compared to 2021.

[Methods and Materials]

The rice varieties used in the test regions are as follows. Naju (Ilmi, ShinDongjin, Saechongmu, Mipum, Hyeonpum, Saeilmi), Daegu (Ilpoom, Saechucheong, Saeilmi), Andong (Saechucheong, Ilpoom, Saeilmi), Yesan (Samkwang, Yechan, Chindeul, Saeilmi, Saenuri). The transplanting period is as follows. Naju (June 5th), Daegu (May. 30th), Andong (May. 18th), Yesan (May. 25th). Since the cultivation method for each region is the same in 2021 and 2022, it is possible to compare the growth response according to the weather conditions in 2021 and 2022.

[Results and Discussion]

The average temperature from May 1 to September 15, 2022 in 17 regions increased by 0.6°C and 0.3°C, respectively, compared to the previous year (2021) and normal years (2017-2021). Hours of sunshine was 875 hours, 25.4 hours longer than the previous year (2021), and 20 hours less than the average year (2017-2021). The heading date of the three regions was delayed despite the increase in the average temperature from transplanting to the heading date. Mid-late cultivating rice responds sensitively to day-length and responds to heading. When the temperature and the Hours of sunshine condition were analyzed by dividing the time based on the day-length (based on the time when the day-length was shorter than 14.3 hours), the temperature decreased slightly, and the Hours of sunshine decreased significantly. In Naju and Daegu, the number of fertile grains increased significantly compared to 2021, and in Andong and Yesan, the number of fertile grains decreased significantly. In Andong and Yesan, the number of panicle (per m²) and the number of grain per panicle decreased significantly. In the reproductive growth stage, hours of sunshine was decreased in all four regions, but the decrease in Andong and Yesan was significantly larger.

[Acknowledgements]

This study was funded in part by the Rural Development Administration National Research Project (Project No : PJ01601801)

*Corresponding author: E-mail, gustjr1029@korea.kr Tel, 063-238-5267