

PA-10

Characteristics of Rice Yields and Quality under Extremely Early Rice Cultivation in the Yeongnam Plain

Seong Hwan Oh^{1*}, Jisu Choi¹, Seo Young Oh¹, Tae Hee Kim¹

¹Paddy Crop Res. Div., Dep. of Southern Area Crop Science, NICS, Miryang 50424, Korea

[Introduction]

Recently, early cultivation of rice is gradually increasing to produce rice before Korean Thanksgiving Day(Chuseok) in the southern plains of Korea. In addition, when Chuseok comes early, rice is planted earlier than regular early cultivation in order to produce rice before Chuseok. Early or extremely early rice cultivation not only increases income by producing new rice before Chuseok, but also disperses the agricultural labor periods in June when rice transplanting is concentrated and October when harvest is concentrated, and avoids natural disasters such as typhoons that can cause damage in August and September. However, early cultivation is a high risk of deterioration in rice quality or yield because the ripening period of the rice is July to August when the temperature is high. Therefore, it is very important to select the optimum variety for extremely early rice cultivation. Accordingly, this study was conducted to use it as basic data for the development of adaptive rice varieties by investigating the yield and quality characteristics of each variety during the extremely early cultivation.

[Materials and Methods]

This study was conducted from 2020 to 2021 in the rice paddies of the Department of Southern Area Crop Science of the National Institute of Crop Science. For the experimental varieties, 14 varieties of early maturing cultivar such as Baekilmi, Jinok and Junamjoseang were grown for 30 days in an unheated greenhouse. Transplantation was carried out on April 7th, 14th, 21st and 28th, and the planting distance was 30x12cm, and number of planted hills was 5. The amount of fertilization was 9, 4.5 and 5.7 kg per 10a, respectively, as components of nitrogen, phosphate and potassium, and other cultivation management followed standard cultivation method of the Rural Development Administration. The yield and quality of rice were investigated in accordance with Agricultural Science and Technology Survey Standards of the Rural Development Administration.

[Results and Discussion]

When cultivated extremely early, the yield of rice tended to increase as the transplanting period was delayed, compared to April 7th, but the rate of increase was modest, about 1-3%. As the heading stage was delayed, the yield increased significantly. Compared to the heading stage before July 5th, when heading on July 5-9, July 10-14, July 15-19 and after July 20, the yield increased by 14%, 32%, 39% and 33%, respectively. When combining the tested variety and the transplanting period, the distribution of heading stage was 39.3% on July 10-14, and 23.2% on July 5-9, July 15-19, and about 62.5% of all combinations were heading on early or mid-July. The varieties with high rice yields were Ungwang, Haedamssal and Haedeul, and their heading stage was in the early or mid-July range. As the transplanting period was delayed, the number of panicle increased and the spikelet number per panicle, percent ripened grains and 1000 grains weight tended to decrease. Thousands of weights had the least tendency compared to other yield component. The head rice ratio increased as the transplanting period was delayed, and there was little difference between April 21st and 28th, and the yield of head rice increased by 3, 4, and 7%, respectively, when transplanting on April 14th, 21st and 28th compared to April 7th. By cultivar, Ungwang, Haedeul and Haedamssal were high yield, so the varieties with relatively late heading stage and high yields also tended to have high quantity of head rice. The protein content was the highest in rice transplanting on the April 28th, and by cultivar, Baekilmi, Jungmo1032 and Joun, which had an early heading stage, were high. Contrary to the head rice ratio, the protein content decrease as the heading stage was delayed.

[Acknowledgement]

본 연구는 농촌진흥청 연구사업(과제번호:PJ01512601)의 지원에 의해 이루어진 결과임

*Corresponding author: E-mail, osh0721@korea.kr Tel. +82-55-350-1161