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# Compatibility and Yield of Fall Crops After Extremely Early Rice Cultivation in Southern Plains

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**[Introduction]**

In southern plains, The number of farmers who use the extremely early rice cultivation method for making freshly harvested rice before Chuseok is increasing to improve income. However, There is a disadvantage that the utilization efficiency of use of arable land is lowered because land is not used for about 240 days from middle ten days-August, the rice harvest season, to middle ten days-April, the rice planting season of the next year. Since winter crops are harvested in May or June and due to climate warming, the temperature is higher until late compared to before. So, it is necessary to develop cropping system introduced fall crops using warm climate for increasing utilization efficiency of use of arable land. Accordingly, in this study, the crop connectivity and yield of buckwheat, potato, and Kimch cabbage were investigated after cultivating rice in paddy fields in southern region.

**[Materials and Methods]**

The study was conducted at paddy-land area in Department of Southern Area Crop Science of National Institute of Crop Science located in Miryang, Gyeongsangnam-do in 2021. Each variety of rice, buckwheat, potato, and Kimch cabbage were Junamjosaeng, Yangjeol, Geumseon and Whiparamgold. Junamjosaeng sown in March 21$^{st}$, transplanted on April 21$^{st}$ and harvested on August 19$^{th}$. Fall crops were seedling or setting on September 13$^{th}$, Yangjeol was harvested on November 19$^{th}$, and Geumseon and Whiparamgold were harvested on December 14$^{th}$.

**[Results and Discussion]**

Duration from sowing(or transplanting or setting) to harvest is 121 days, 67 days, and 92 days, respectly, for Junamjosaeng, Yangjeol and Geumseon and Whiparamgold. Junamjoseang yield is about 525 kg/10a. Yangjeol quantity came out 122 kg/10a, decreasing 43% compared to the previous year when it was sown on August 31$^{st}$. As a result of investigate Geumseon which is each tuber weighs more than 51 g among all tubers, the number of heavy potatoes was similar to 2020 sowing on September 1$^{st}$, but the weight decreased by 68% compared to 2020. Whiparamgold's weight, which was setting on September 9$^{th}$, 2020, was 2.93 kg per plant, but the Kimch cabbage harvested in 2021 was 1.19 kg per plant and failed to formed bulbing. There was no problem in terms of crop connectivity in extremely rice cultivation, buckwheat, potato, and napa cabbage in extreme early rice cropping system. However there was a large difference in growth and development according to the planting date depending on the weather from the last ten days of August to leading ten days of September. In addition, frost and low temperatures in November greatly affect the yield of buckwheat and potatoes, it is necessary to prepare to prevent damage in order to use them as income crops.

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