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Effects of Different Nitrogen Application Levels on Yield and Protein Content of Rice Varieties in Korea

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[Abstract]

In order to evaluate the effect of nitrogen application levels on yield and protein content of rice varieties, a field experiment was conducted at National Institute of Crop Science of Korea in 2020. Five levels(0, 3, 5, 7, and 9 kg·10a⁻¹) of nitrogen fertilizer were treated to six Korean rice varieties. The nitrogen uptake amount, soil nitrogen content before and after rice cultivation, milled rice yield, and protein content in head rice were analyzed. As the treatment of nitrogen fertilizer increased, the nitrogen uptake amount of plants increased significantly. However, changes in nitrogen content in the soil before and after rice cultivation were different for each cultivar. The amount of nitrogen change in the soil decreased as the amount of nitrogen application increased in the three cultivars of Haepum, Gopum, and Odae, and the other three cultivars showed the opposite trend. As a result of correlation analysis of nitrogen application amount, nitrogen uptake amount, milled rice yield, and protein content of head rice, the five varieties except for Haepum showed a high correlation between these factors. The amount of nitrogen application and nitrogen uptake of plant showed a positive correlation about the milled rice yield and protein content of head rice. In particular, the protein content in head rice appeared to be more affected by nitrogen uptake amount than nitrogen application amount.

As a result of this study, the yield and protein content of rice had positive correlations with the level of nitrogen fertilizer, and had a high correlation with the nitrogen absorption of plants.

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