PA-14

Yearly Variation of Growth and Yield of Green Maize (*Zea mays* L.) under Different Paddy-Upland Rotation.

Seong-tak Yoon[1*], Yang jing[1], Young-Ju Oh[2], Kang Bo Shim[3]

[1]Collage of Bio-Resource Science, Dankook Univ., Cheonan 31116, Korea
[2]Institute for Future Environmental Ecology Co., Ltd, Jeonju 54883, Korea
[3]National Institute of Crop Science, RDA, Suwon 16613, Korea

[Introduction]

In the past, Korea focused more on increasing rice production for self-sufficiency of food, and rice self-sufficiency rate has increased to 95.7% in 2013. However, due to increase in rice stock amount, the government decided to decrease rice cultivation area.Therefore, this study was conducted for three main purposes. The first was to investigate the growth and yield of green maize in the organic paddy-upland rotation system, the second was to investigate yearly variation of growth and yield of green maize and the third was to select the suitable varieties for paddy-upland rotation.

[Materials and Methods]

This study was conducted in a field of sandy loam located in the middle district of Gyeonggi-do, Korea (37°00' 40.7"N,127°11'35.0"E). We used the upland field rotated from matured paddy field, which have been used as a paddy field long time, for three years from 2015 to 2017. 8 varieties of green maize (Mibaek2, Ilmichal, Daehakchal, Chalok4, Miheukchal, Eolrukchal1, Heukjinjuchal, and Heugjeom2) were tested. Planting space was 70cm (ridge) × 10cm (plant). Plot design was randomized block deign with three replications. Other cultural and analyzing methods were based on the standards of RDA in Korea. Statistical analysis of the data was conducted by use of SAS 9.2.

[Results and Discussions]

Plant height in the three-year average of 8 varieties showed 260.0 cm in the 1st year, 236.8 cm in the 2nd year and 201.6 cm in the 3rd year. Among the three-year average of 8 varieties, Miheukchal and Ilmichal were the highest plant height by 254.1 cm and 252.2 cm and the lowest plant height was Mibaek 2 (222.6 cm). Plant height was big difference among three years, showing the reducing trend by 30 cm as the number of years of upland cultivation increased. In the three-year average of 8 varieties, ear height was 133.1 cm in the 1st year, 113.3 cm in the 2nd year and 95.4 cm in the 3rd year. Ear height was also big difference among three years, showing the reducing trend by about 18 ~ 20 cm as the number of years of upland cultivation increased from rice paddy. In the three-year average of 8 varieties, ear length in the 1st, 2nd and 3rd upland years were 18.2 cm, 17.9 and 17.3 cm respectively, and showed no difference among three years. Yearly yield per 10a was that the highest yield was 949.6 kg in the 1st year, the second was 675.4 kg in the 2nd year, and the 3rd year was 680.6 kg. Green maize yields tended to decrease with increasing number of years rotated upland from rice paddy field to upland field. This is probably due to the higher water content in soil and high nutrient content in the first year. Among 8 varieties of green maize, both varieties of Chalok 4 and Ilmichal showed the highest yield with about 900 kg per 10a in the three-year average of 8 varieties. Chalok 4 and Ilmichal was considered to be suitable varieties for paddy-upland rotation.

[Acknowledgements]

This research was supported by a grant from the Rural Development Administration (Project No: PJ0126192018)

*Corresponding author: Tel. +82-41-550-3623, E-mail. styoon@dankook.ac.kr