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Effect of Different Planting Dates and Tillage Practices to Maize Development Planted Paddy Soil

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[Introduction]

Due to reduced rice consumption, rice paddy converted to upland for winter cash crop and summer food crop rotation such as onion-soybean, onion-maize in southern Korea. For those cropping systems, it is crucial to evaluate a suitable window of planting date and tillage practices. Thus, the current study was conducted to evaluate yield and plant canopy development under different planting dates and tillage practices of silage and waxy corn grown in paddy soil.

[Materials and Methods]

The research was implemented at Gyeongsang National University research farm located Sacheon, Gyeongnam where it had been used for rice production for decades. The experimental design was a randomized complete block design with a split-plot arrangement. Tillage practices; deep cultivation + conventional tillage (DC) and conventional tillage only (CT) was main-plot, and planting date (6/15, 7/3 and 7/15; Date1, 2, and 3, respectively) was sub-plot. After winter onion was harvested on June 5th, silage corn 'Kwangpyeongok' and waxy corn 'Ilmichal' were planted and analyzed separately in 2019. Fertilizer was split applied to the level of 10-8-8kg/10a at planting and N only (10kg/10a) at 3 weeks after planting. Other management practices were under RDA guideline. Plants were harvested and analyzed when they reached ideal maturity for silage and waxy corn, respectively. Five weeks after planting, we measured Leaf Area Index (LAI) Using LAI-2200c (Li-Cor) and then calculated Leaf Area Duration (LAD).

[Results and Discussion]

Yield and quality of harvested silage and waxy corn were significantly decreased by delaying planting dates, across to tillage practices. The dry weight yield of silage corn was significantly reduced from Date1 (2,463kg/10a) to Date2 (1,725kg/10a) and Date3 (1,530kg/10a); 29.9% and 37.9% reduction, respectively. Fresh ear yield of waxy corn was significantly decreased from Date1 (872kg/10a) and Date2 (814kg/10a) to Date3 (525kg/10a); 40%, 35.5% reduction, respectively. Across to tillage practices and varieties, total LAD was significantly decreased from Date1 (223.7) and Date2 (182.8) to Date3 (158.0); 29.4%, 13.5%, respectively. LAD reduction shown poor development of canopy and affected yield of delayed planting date. However, tillage practices did not affect crop development in our study. Through generally it is variable under different soil characteristics and cumulative count of practices. Thus, long term research about effect different tillage practices and various weather conditions from planting date for suitable cropping system for upland crop in paddy soil.

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