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Growth Characteristics And Yield of Corn(*Zea mays* L.) for Grain by Early Sowing Date in the Central Region of South Korea

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[ABSTRACT]

The limit of crop cultivation is moving northward due to the temperature rise by climate change. There is a problem with crop growth if early sowing is performed at a time when the temperature is low. It is difficult to secure crop productivity and cultivation stability due to the low temperature and short cultivation period. Therefore, this study was conducted to analyze the change in growth characteristics and yield of corn for grain when early sowing is performed in central region of South Korea.

This experiment was conducted at experimental field of Suwon in 2021. Three varieties of corn for grain such as Kwangpyeongok, Sinhwangok, and Hwangdaok were sown at intervals of 5 days from 20 March to 15 April. The planting density at this time was sown with a row interval of 70 cm and a plant interval of 25 cm. Nitrogen, phosphoric acid, and potassium fertilizers were applied at 17.4 kg, 3.0 kg, and 6.9 kg per 10a, respectively. Phosphoric acid and potassium fertilizers were all applied before sowing and nitrogen fertilizer was applied 50% before sowing and 50% in the fifth leaf period. The corn growth characteristics and yield components were investigated.

The seedling establishment rate by sowing date was in the range of 68.5~88.5%, and it showed a difference depending on the variety. The range of days from sowing to tassel and silk emergence by sowing date was 79.9~98.4 and 81.0~98.9 days, respectively. As the sowing date was delayed, the days from sowing to tassel and silk emergence decreased. The growth characteristics and yield of corn by sowing date are as follows. Plant height was the highest at 241.3 cm at the sowing on 25 March, and Stalk diameter was the thickest at 25.6 mm at the sowing on 31 March. The fresh weight per plant was the highest at 728 g at the sowing on 25 March, and the dry weight per plant was the highest at 185 g at the sowing on 31 March. Corn growth characteristics did not show a certain trend depending on the sowing date, and corn growth was more vigorous at the sowing on March 25 and 31 than the others. In the case of ear weight, it was the heaviest with 344 g at the sowing on 25 March, and filled ear length ratio showed a tendency to decrease as the sowing time was delayed. The weight of 100 grains and grain yield per 10a of maize were the highest at 36.0g and 878.7kg/10a, respectively at the sowing on 25 March. Although the growth and yield of corn for grain were good during early sowing in the central region of South Korea, it is necessary to investigate the limit temperature for early sowing of corn by examining the annual variation according to weather conditions.

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