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# Prediction of Drought Damage using Meteorological Factor Analysis in Corn

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## Extended Abstract

In Korea, cultivation of corn and soybeans has been attempted to improve food self-sufficiency by using reclaimed land created in the 1980s.[1] It was well known that crops suffered from early growth and development inhibition, photosynthesis and yield reduction due to drought stress.[2] In this study, the crop evapotranspiration (ETc) was calculated through the analysis of climatic factors in the reclaimed land, and the vulnerability to drought stress was evaluated for each growing season of corn.

Corn was cultivated (April 28 to August 31, 2021) in the Saemangeum reclaimed land (Gimje-si, Jeollabuk-do). During the corn cultivation period, the weather station measuring device (Watch model 2900ET) was installed to collect soil moisture content and meteorological data at 1-hour intervals. Standard evapotranspiration (ETo) was calculated using Specware Pro 9 software (FAO-Penman Montrith equation) [3], and crop evapotranspiration (ETc=ETo x Kc) was applied by crop coefficients (Rural Development Administration) for each growing season of corn.

In this study, the mean value of crop evapotranspiration (ETc) during the corn cultivation period of the Saemangeum reclaimed land was 6.3mm/day, and the precipitation was 9.2mm/day. The precipitation was higher than the crop evapotranspiration during the corn cultivation period, but in May and June, the crop evapotranspiration (284mm) was higher than the precipitation (190mm). It meaned that irrigation was required during this period. In addition, the soil moisture content in June was also low at 12.6%, which was confirmed to be less than the effective moisture content (0.2 bar to 0.5 bar). It was determined that water shortage would occur in the early stages of growth (G1~G2) during corn cultivation (sowing on April 28) depending on natural rainfall in reclaimed land. Therefore, it was considered to be effective to delay the sowing time to prevent damage to corn grown on reclaimed land.

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