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Development of Crop Growth Model under Different Soil Moisture Status

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[Abstract]

It is necessary to maintain stable crop productions under the unsuitable environments, because the drought and flood may be frequently caused by the global warming. Therefore, it is agent to improve the crop growth model corresponded to soil moisture status. Chili pepper (*Capsicum annuum*) is one of the useful crop in Asia, and then it is affected by change of precipitation in consequence drought and flood occur however crop model to evaluate water stresses on chili pepper is not enough yet. In this study, development of crop model under different soil moisture status was attempted. The experiment was conducted on the slope fields in the greenhouse. The water level was kept at 20cm above the bottom of the container. Habanero (*C. chinense*) was used as material for crop model. Sap bleeding rate, SPAD value, chlorophyll content, stomatal conductance, leaf water potential, plant height, leaf area and shoot dry weight were measured at 10 days after treatment (DAT) and 13 DAT. Moreover, temperature and RH in the greenhouse, soil volume water contents (VWC) and soil water potential were measured. As a result, VWC showed 4.0% at the driest plot and 31.4% at the wettest plot at 13 DAT. The growth model was calculated using VWC and the growth analysis parameters. It was considered available, because its coefficient of determination showed 0.84 and there are significant relationship based on plants physiology among the parameters and the changes over time. Furthermore, we analyzed the important factors for higher accuracy prediction using multiple regression analysis.

Keywords: crop growth model, soil moisture status, *C. annuum*, multiple regression analysis, growth analysis

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