POSTER 03

토마토 줄기 신장 예측을 위한 온도반응 함수 비교

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Intercomparison of Thermal Functions for Estimating Stem Elongation of Tomato

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1. Introduction and Objectives

The plant height of tomato (*Solanum lycopersicum* L.) alters the canopy structure, light interception, and therefore dry mass production. Thus, accurate simulation of plant height is fundamental to improving the performance of dynamic functional-structural plant model. The objective of this study was evaluating the accuracies of three different thermal functions for stem elongation of tomato under varying temperature regimes.

2. Materials and Methods

The tomato cv. Dafnis was grown under the four temperature-controlled plastic houses [ambient (AT), AT+1.5°C, AT+3.0°C, AT+5.0°C] in 2017. Stem elongation rates (cm d^{-1}) were measured every week and were used to evaluate the three thermal functions: thermal time, linear function, and nonlinear function (Wang and Engel, 1998). Cardinal temperatures were determined according to the previous studies, base temperature of 8°C (Najila *et al*., 2009), optimum temperature of 26°C (Boote *et al*., 2012). Maximum temperature was set to 48°C, the maximum temperature for vegetative growth suggested by Boote *et al*.(2012).

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3. Results and Discussion

Linear (R^2 = 0.47) and nonlinear functions (R^2 = 0.48) were more precise than thermal time approach (R^2 = 0.12). However, the poor performances of the functions (R^2 < 0.5) were associated with the uncertainty in the maximum temperature for stem elongation and the radiation effect on stem elongation which was not considered in the present study.

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