Growth models for stem diameter of Rhino sunflower cultivar

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Abstract

Growth models allows knowing the culture growth pattern and optimizing the management. The aim of this work was to characterize the growth of the Rhino sunflower cultivar using the Logistic (L) and Gompertz (G) models and to make considerations regarding parameters. The data used come from one uniformity trial with the Rhino confectionery sunflower cultivar conducted in Federal University of Santa Maria - in Frederico Westphalen – RS/BR, in the 2019/2020 agricultural harvest. Were performed 14 evaluations with an interval of one week, were evaluate stem diameter (SD) on 10 plants randomly collected. The data were adjusted according to the equations $yi = \frac{a}{1+e^{(b-c*x_i)}} + \varepsilon_i$ and $yi = ae^{[-e^{(b-c*x_i)}]} + \varepsilon_i$, for L and G, respectively, in function of the thermal time accumulated, using generalized least squares (GLS) and the power method to structure the covariance matrix. The fit quality of the models to the data was measured by the adjusted coefficient of determination (R^2_{adj}), Akaike information criterion (AIC) and Bayesian information criterion (BIC). The studied models described satisfactorily the growth curve in SD of the sunflower, providing parameters with practical interpretations. The Logistic model has the best fit quality, being the most suitable for characterizing the growth curve. The parameters estimate for *a* (asymptote), *b* (scale parameter) and *c* (growth rate) are, 27.316, 3.388, 0.0079 respectively, and fit criteria are 0.914, 648.088 and 662.796 for R^2_{adj}, AIC and BIC e respectively, for Logistic model.

Keywords: *Helianthus annuus* L.; Logistic; Gompertz; growth curve.

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