

AGROMETEOROLOGICAL MODEL FOR ESTIMATION OF LEAF AREA INDEX IN IRRIGATED PROCESSING TOMATO

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INTRODUCTION

The leaf area index (LAI) is important information used in crop modelling. It is obtained by a destructive process, what is sometimes inconvenient.

OBJECTIVE

The objective of this research was to adjust a mathematical model that best describes the LAI of irrigated processing tomato, using a non-destructive method that uses photographs taken *in situ* and a public domain software ImageJ.

MATERIALS AND METHODS

Samples were taken at 15, 30, 45, 60, 75, 105, 130 days after planting. For the photographic method a ruler of 1m² was placed on the soil in 24 randomized sampling points, and for each point a photograph was taken. The Gaussian model below was calibrated for LAI estimation in function of thermal index from planting date.

$$Y = Y_0 + A \times e^{-\frac{(X - X_0)^2}{2w^2}}$$

Where : $Y_0 = -4,85$
 $A = 3,09$
 $X_0 = -4,95$
 $w = 0,19$

RESULTS

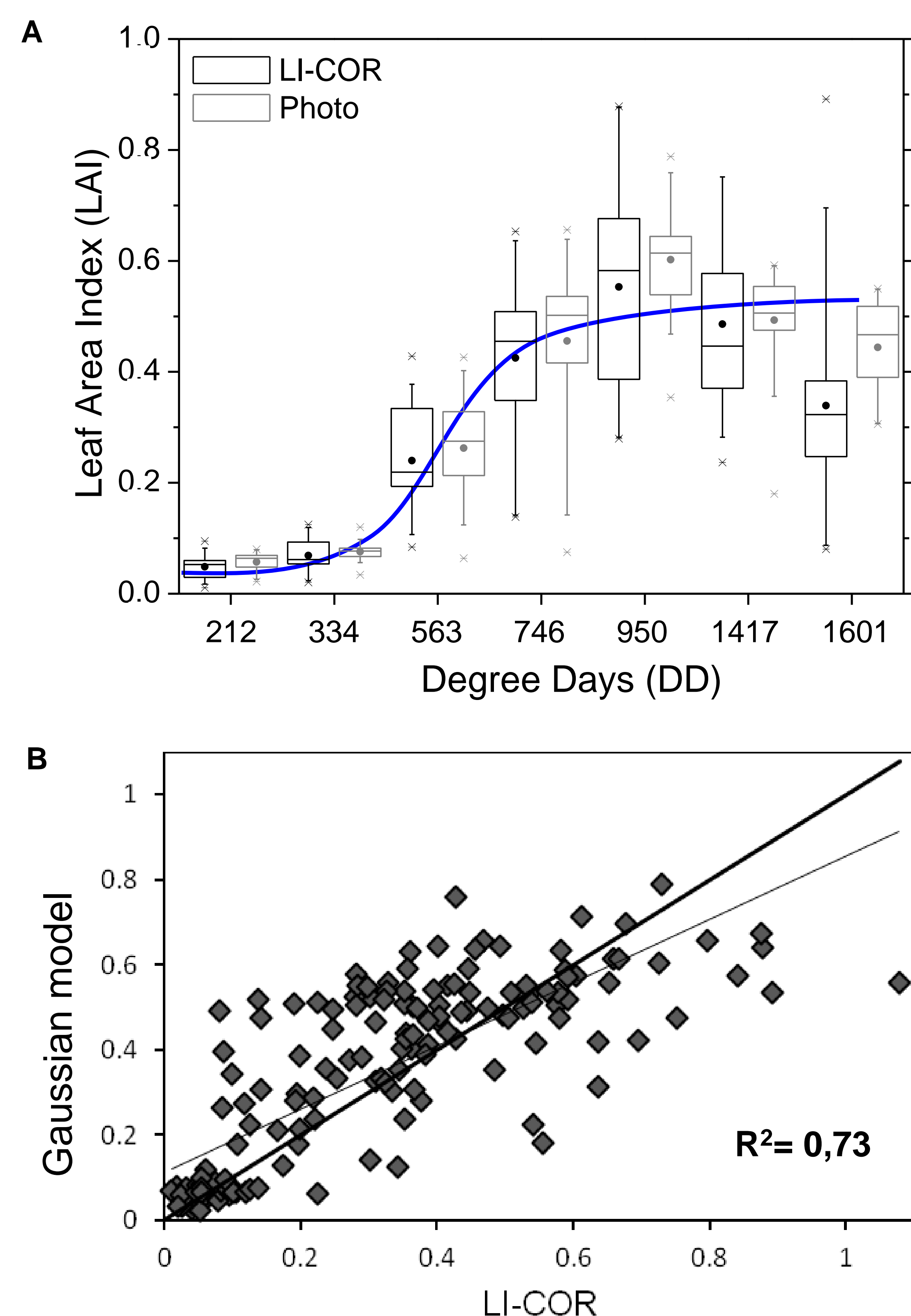


Figure 1: A) Adjusted Gaussian model for Leaf Area Index (LAI) estimations; B) Performance analysis of Gaussian model in relation to LI-COR measurements

CONCLUSIONS

The Gaussian model was accurated (MAPE=0,4%) and precise (R²=0.94).

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